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Indigenous Medicinal Plants Available in Handia Tehsil of Prayagraj: An Ethnomedicinal Study

Saumya Mishra

Department of Botany,
K.N. Govt. PG College, Gyanpur, Bhadohi
Email ID: saumyamishra224@gmail.com

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ABSTRACT

Handia Tehsil of Prayagraj district is rich in medicinal plant diversity and traditional knowledge associated with herbal healthcare. The present study documents twelve medicinal plant species, namely *Aloe vera* (Ghrithkumari), *Withania somnifera* (Ashwagandha), *Chenopodium album* (Bathua), *Ruscus aculeatus* (Butcher's Broom), *Santalum album* (Chandan), *Cissus quadrangularis* (Hadjor), *Cymbopogon citratus* (Lemon Grass), *Melia dubia* (Malabar Neem), *Moringa oleifera* (Moringa), *Calotropis gigantea* (Safed Madar), *Asparagus racemosus* (Shatavari), and *Ocimum tenuiflorum* (Tulsi). These species belong to different plant families and possess significant medicinal value due to the presence of bioactive compounds such as alkaloids, flavonoids, saponins, tannins, terpenoids, glycosides, and vitamins. The documented plants are traditionally used for the treatment of a wide range of ailments including skin disorders, respiratory diseases, digestive problems, fractures, inflammation, diabetes, hypertension, anemia, reproductive disorders, fever, and immune-related conditions. Several species, particularly *Aloe vera*, *Ashwagandha*, *Tulsi*, *Shatavari*, and *Moringa*, are widely recognized for their therapeutic and nutritional benefits. The study emphasizes the importance of conserving medicinal plant resources and preserving traditional ethnomedicinal knowledge in the region. Proper documentation and sustainable utilization of these plants can contribute to primary healthcare and provide opportunities for future pharmacological research and herbal drug development.

Keywords: Medicinal plants, Handia Tehsil, Prayagraj, Ethnomedicine, Phytochemicals, Traditional healthcare, Herbal medicine

INTRODUCTION

Medicinal plants have been an essential component of human healthcare since ancient times and continue to form the backbone of traditional medicinal systems across the world. India, with its rich biodiversity and cultural heritage, has a long-standing tradition of plant-based healing practices. The classical works of Ayurveda, such as Charak Samhita and Susruta Samhita, stand as magnum opus in the field of medicine, describing the therapeutic uses of numerous plants in the treatment of various ailments (Chopra 1982; Mishra and Tiwari, 2017 & 2019). These ancient texts highlight the deep scientific understanding of medicinal flora that existed in traditional Indian knowledge systems.

However, in recent decades, the declining availability of medicinal plant species and the gradual fading of indigenous knowledge have emerged as serious concerns. This situation has made the sustainable management of natural habitats an important environmental issue, directly linked to biodiversity conservation and the welfare of local communities (Jain, 1996; Kirtikar and Basu, 1918). Therefore, documentation and preservation of ethnomedicinal knowledge are essential for future generations.

Handia Tehsil of Prayagraj district is enriched with diverse vegetation, including several medicinally important plant species that are widely used by rural communities for primary healthcare. These plants are valued for their bioactive compounds such as alkaloids, flavonoids, tannins, saponins, glycosides, and essential oils, which exhibit significant pharmacological activities.

For the present study, medicinal plants were collected from different parts of the Handia region. The collected specimens were processed and herbarium sheets were prepared following standard methods (Lawrence, 1951; Chopra *et al.*, 1956) with slight modifications. The plant samples were

properly dried by frequent changing of newspapers and treated with mercuric chloride solution in alcohol to prevent fungal contamination. The dried specimens were mounted on standard herbarium sheets, properly labelled, and arranged alphabetically according to botanical names. Voucher specimens were finally deposited in the Department of Botany for future reference and study.

MATERIALS AND METHODS

For the ethnomedicinal study of medicinal plants at Handia Tehsil of Prayagraj different plant has been collected from rural areas with the help of locally available farmers of the villages. Most of the information was collect from the farmers and note down at the collection site about the medicinal properties and their application of indigenous plants. Finally, easily available plants of Tehsil Handia were listed and describe in the portion of result.

RESULTS

Some of the significant medicinal plants are described below. Their taxonomical description and pharmacological uses are provided.

1. Aloe Vera (Red) or Ghritkumari, *Aloe vera* (L.) Burm.f. (Asphodelaceae)

Description: A succulent perennial herb with thick, fleshy, lance-shaped leaves arranged in a rosette. Leaves are green to reddish-green, containing a clear mucilaginous gel. Margins are serrated with small teeth. Flowers are tubular, yellow to orange, borne on tall spikes (Table 1). Flowering and Fruiting: December–April.

Phytochemicals: Aloin, aloe-emodin, anthraquinones, saponins, vitamins A, C, E, polysaccharides, amino acids.

Pharmacological Uses: Used for wound healing, burns, skin disorders, digestive ailments, inflammation, and immune support.

2. Ashwagandha or Indian Ginseng, *Withania somnifera* (L.) Dunal (Solanaceae)

Description: An erect, evergreen undershrub reaching up to 1.5 m in height. Leaves simple, ovate, pubescent, and dull green. Flowers small, greenish-yellow, borne singly or in clusters. Fruits are bright orange-red berries enclosed within a persistent calyx (Table 1). Flowering and Fruiting: October–March.

Phytochemicals: Withanolides, withaferin A, alkaloids, sitoindosides, flavonoids, tannins.

Pharmacological Uses: Used as an adaptogen for stress, anxiety, insomnia, fatigue, arthritis, and improving immunity and vitality.

3. Bathua, *Chenopodium album* L. (Amaranthaceae)

Description: Erect, branched herb up to 1 m or more tall. Stems angular, ribbed with dark green and red streaks, densely covered with powdery vesicles in younger parts. Leaves ovoid-rhomboid; lower leaves coarsely dentate or lobulated; upper leaves smaller, elliptic-oblong, almost entire. Flowers pentamerous, arranged in paniced clusters. Perianth lobes connate at base, concave. Stamens slightly exserted. Ovary depressed-globose; stigmas 2. Utricle enclosed between perianth lobes, papillose; seed lenticular (Table 1). Flowering and fruiting: September–May.

Phytochemicals: Ecdysteroids, β -ecdysone, polypodine, ascorbic acid, β -carotene, catechins, caffeic acid, p-coumaric acid, ferulic acid, β -sitosterol, stigmasterol.

Pharmacological uses: Used as a tonic, laxative, blood purifier, anthelmintic, and diuretic. Seeds are used for liver and spleen enlargement.

4. Butcher's Broom, *Ruscus aculeatus* L. (Asparagaceae)

Description: A low-growing evergreen shrub with rigid, leaf-like cladodes ending in sharp spines. True leaves are reduced and inconspicuous. Flowers are small, greenish-white, arising from the center of cladodes. Fruits are bright red berries (Table 1). Flowering and Fruiting: February–May.

Phytochemicals: Ruscogenin, neoruscogenin, flavonoids, steroidal saponins, sparteine.

Pharmacological Uses: Used for varicose veins, hemorrhoids, poor circulation, leg swelling, and vascular disorders.

5. Chandan or Sandalwood, *Santalum album* L. (Santalaceae)

Description: A small evergreen, semi-parasitic tree with smooth grayish-brown bark. Leaves opposite, ovate to elliptic, glabrous and shiny. Flowers small, purplish-brown to reddish, arranged in terminal panicles. Fruits are globose drupes turning purple-black when mature (Table 1). Flowering and Fruiting: June–December.

Phytochemicals: α -Santalol, β -santalol, santalenes, tannins, terpenoids.

Pharmacological Uses: Used in skin diseases, urinary tract infections, fever, anxiety, inflammation, and as an aromatic and cooling agent.

6. Hadjor, *Cissus quadrangularis* L. (Vitaceae)

Description: A succulent twiner, rambling shrub. Stem 4-angled, glabrous, winged or margined, contracted at nodes. Leaves simple, early caducous, ovate to suborbicular, thick and coriaceous. Cymes umbellate; flowers greenish-yellow, red-lipped. Berry globose, apiculate; seeds smooth (Table 1). Flowering and fruiting: April–November.

Phytochemicals: Carotene, calcium oxalate, vitamin C, α -myrone, β -sitosterol, n-hexadecanoic acid, glycerin, tetradecanoic acid.

Pharmacological uses: Used in the treatment of piles, fractures, irregular menstruation, asthma, and eye disorders.

7. Lemon Grass or Gandhatrina, *Cymbopogon citratus* (DC.) Stapf (Poaceae)

Description: A tufted aromatic perennial grass with long, narrow leaves having a strong lemon fragrance. Culms are erect and form dense clumps. Inflorescence consists of terminal panicles. Flowering and Fruiting: Rarely flowers under cultivation; generally August–November (Table 1).

Phytochemicals: Citral, geraniol, limonene, citronellal, myrcene, flavonoids.

Pharmacological Uses: Used in fever, digestive disorders, cough, cold, stress relief, and as an antimicrobial and antioxidant agent.

8. Malabar Neem or Maha Neem, *Melia dubia* Cav. (Meliaceae)

Description: A fast-growing deciduous tree attaining considerable height. Leaves bipinnate to tripinnate, large and aromatic. Flowers small, white, fragrant, borne in panicles. Fruits are yellow drupes when ripe (Table 1). Flowering and Fruiting: January–June.

Phytochemicals: Limonoids, flavonoids, alkaloids, triterpenoids, tannins.

Pharmacological Uses: Used traditionally for antimicrobial, anti-inflammatory, insecticidal, and wound-healing purposes.

9. Moringa or Drumstick, *Moringa oleifera* Lam. (Moringaceae)

Description: A small to medium-sized deciduous tree with soft wood and drooping branches. Leaves are tripinnate and feathery. Flowers are fragrant, creamy-white, arranged in panicles. Fruits are long, pendulous pods containing winged seeds (Table 1). Flowering and Fruiting: Throughout the year, mainly February–September.

Phytochemicals: Quercetin, kaempferol, glucosinolates, vitamins A and C, minerals, phenolic acids.

Pharmacological Uses: Used for malnutrition, diabetes, hypertension, inflammation, anemia, and as an antioxidant and immune booster.

10. Safed Madar, *Calotropis gigantea* (L.) R.Br. (Asclepiadaceae)

Description: Large shrub, reaching small tree size. Leaves elliptic to obovate, 10–20 cm long, amplexicaul or cordate at base, with a ring of glandular lateral hairs at the base of lamina. Flowers white, in sub-umbellate cymes. Sepals cottony. Corolla campanulate, divided more than halfway down; lobes revolute and twisted with age. Follicles in pairs, boat-shaped, with a hooked tip, cottony pubescent. Seeds with long silky coma. Flowering and fruiting: Throughout the year.

Phytochemicals: Calotoxin, calotropin, syriogenin, procero-side, uscharidin, voruscharin, theaspirone, calactinic acid.

Pharmacological uses: Used in the treatment of leprosy, leucoderma, ulcers, tumors, piles, and spleen disorders. Root bark is emetic, diaphoretic, alterative, and purgative.

11. Shatavari, *Asparagus racemosus* Willd. (Asparagaceae)

Description: A climbing, spinous perennial herb with numerous tuberous roots. Leaves are reduced to scales; cladodes are needle-like and arranged in clusters. Flowers are small, white, fragrant, borne in racemes. Fruits are red berries (Table 1). Flowering and Fruiting: July–December.

Phytochemicals: Shatavarins, saponins, flavonoids, alkaloids, asparagine, isoflavones.

Pharmacological Uses: Used in reproductive disorders, lactation enhancement, gastric ulcers, debility, and as an adaptogenic and immunomodulatory agent.

12. Tulsi or Holy Basil, *Ocimum tenuiflorum* L. or *Ocimum sanctum* L. (Lamiaceae)

Description: An aromatic, erect branched herb or undershrub. Leaves are opposite, ovate, green or purple, with serrated margins and a characteristic aroma. Flowers are small, purplish-white, arranged in terminal racemes. Fruits are small nutlets (Table 1). Flowering and Fruiting: Throughout the year, mainly September–March.

Phytochemicals: Eugenol, ursolic acid, rosmarinic acid, linalool, flavonoids, tannins.

Pharmacological Uses: Used in respiratory disorders, fever, cough, cold, stress, diabetes, and for its antimicrobial, anti-inflammatory, and antioxidant properties.

Table 1: Some medicinal plants collected from Handia tehsil of Prayagraj, Uttar Pradesh

S.No.	Common Name	Scientific Name	Family
1	Aloe Vera (Red)	<i>Aloe vera</i> L.	Asphodelaceae
2	Ashwagandha	<i>Withania somnifera</i> L.	Solanaceae
3	Bathua	<i>Chenopodium album</i>	Amaranthaceae
4	Butcher's Broom	<i>Ruscus aculeatus</i> L.	Asparagaceae
5	Chandan (Sandalwood)	<i>Santalum album</i> L.	Santalaceae
6	Hadjor	<i>Cissus quadrangularis</i>	Vitaceae
7	Lemon Grass	<i>Cymbopogon citratus</i> DC.	Poaceae
8	Malabar Neem	<i>Melia dubia</i> Cav.	Meliaceae
9	Moringa (Drumstick)	<i>Moringa oleifera</i> Lam.	Moringaceae
10	Safed Madar	<i>Calotropis gigantea</i>	Asclepiadaceae
11	Shatavari	<i>Asparagus racemosus</i> Willd.	Asparagaceae
12	Tulsi	<i>Ocimum tenuiflorum</i> L.	Lamiaceae

DISCUSSION

The present ethnomedicinal study of Handia Tehsil, Prayagraj, reveals a rich diversity of medicinal plants that are widely used in traditional healthcare systems by local communities. The documented species demonstrate significant pharmacological importance due to the presence of diverse bioactive compounds such as alkaloids, flavonoids, saponins, tannins, terpenoids, glycosides, vitamins, and essential oils.

Aloe vera is one of the most commonly used medicinal plants, valued for its gel rich in polysaccharides and anthraquinones, which support wound healing, skin repair, and digestive health. Similarly, Ashwagandha acts as a powerful adaptogen due to withanolides, helping in stress reduction, immunity enhancement, and neurological balance, making it highly significant in traditional medicine (Agharkar, 1956; Anonymous, 2002).

Leafy vegetable Bathua serves both nutritional and medicinal roles, acting as a laxative, diuretic, and blood purifier, while also providing essential micronutrients. *Ruscus aculeatus* is particularly important for vascular health, showing effectiveness in treating varicose veins and circulatory disorders due to steroidal saponins (Mishra *et al.*, 2016).

Sandalwood exhibits cooling, antimicrobial, and anti-inflammatory properties and is widely used for skin and urinary tract disorders. Hadjor is notable for its bone-healing properties and is traditionally used in fractures and joint-related ailments (Mishra and Tiwari, 2017 & 2019).

Aromatic plants like Lemongrass and Tulsi play an important role in treating respiratory infections, fever, and stress-related conditions due to their strong antimicrobial and antioxidant activities. *Melia dubia* shows potential as an anti-inflammatory and insecticidal plant, supporting both medicinal and agricultural uses (Tiwari *et al.*, 2016 & 2017).

Moringa oleifera is highly valued for its nutritional richness and therapeutic potential in managing diabetes, anemia, and hypertension. *Calotropis gigantea* is a potent medicinal shrub used in treating skin diseases and chronic disorders, though it requires careful handling due to toxic constituents. In-addition, Shatavari is an important reproductive tonic and adaptogen, especially beneficial in women's health, while also supporting gastric and immune functions (Anonymous, 2002; Mishra and Tiwari, 2019).

Overall, the study highlights that medicinal plants of Handia Tehsil are not only therapeutically significant but also form an integral part of local healthcare traditions. Their widespread use reflects strong ethnobotanical knowledge, which is now at risk due to modernization and habitat loss. Therefore, conservation of these plant resources and documentation of traditional knowledge are essential for sustainable utilization and future pharmacological research.

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