

## Exploring the Medicinal Marvels of *Justicia Adhatoda*

Sarvechana Singh

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

[singhsarvechana@gmail.com](mailto:singhsarvechana@gmail.com)

### Abstract

This study provides a concise overview of the medicinal properties and potential toxicity of *Justicia adhatoda*, commonly known as Malabar nut or Vasaka. This plant has been extensively used in traditional medicine for treating various ailments, ranging from respiratory conditions to cancer and neurodegenerative disorders. These findings offer promising avenues for the development of new therapeutics targeting cancer, infectious diseases, and neurodegenerative disorders. However, further research is needed to fully understand the mechanisms of action, safety profile, and clinical efficacy of *Justicia adhatoda*. By carefully evaluating its benefits and potential risks, we can harness its therapeutic potential while ensuring its safe use in medical practice.

Keywords: *Justicia adhatoda*, traditional medicine, medicinal properties, therapeutic potential, research.

### Introduction

Since ancient times, medicinal plants have captivated human interest, playing a crucial role in sustaining human health through herbal medicine. Approximately 80% of people in developing countries rely on traditional remedies for their primary healthcare needs (Kunwar et al., 2005). Native American and other indigenous tribes have long utilized plants as their primary source of medicinal remedies, integral to their pharmacopoeias (Singh et al., 2014). *Justicia adhatoda*, known by its Sanskrit name Vasaka in Ayurveda, is recognized for its primary bronchodilator alkaloid, vasicine, which makes it valuable in treating respiratory ailments (Jyoti Rani et al., 2018). This plant's therapeutic potential is increasingly validated through contemporary research, highlighting its role in both traditional and modern medicinal systems. Commonly known as Malabar nut,

Adusa, or Vasaka, is an important medicinal plant with a long history of use in traditional medicine, particularly for respiratory conditions. This evergreen shrub, native to India, exhibits significant pharmacological properties due to its active compounds, making it a valuable resource in both traditional and modern herbal medicine. Its broad range of therapeutic applications underscores its significance in medicinal practices worldwide.

*Justicia adhatoda* belongs to the Plantae kingdom, Angiosperms division, Eudicots class, Acanthaceae family, Lamiales order, and Justicia genus. The primary active compound, vasicine, along with other phytochemicals, contributes to its medicinal efficacy. The plant's phytochemical profile supports its traditional use and provides a foundation for modern pharmacological applications.

*Justicia adhatoda* is a tall, highly branched evergreen shrub with large, lance-shaped leaves and flowers that can be either purple or white. It thrives in tropical and subtropical regions, often found in hilly areas and along roadsides. The plant is distributed from Bengal and Assam in the southeast to Punjab in the north, and extends to Singapore. Its resilience and adaptability to various environments contribute to its widespread use in herbal medicine. The expertise in traditional herbal medicine has become an invaluable asset for contemporary drug research endeavors. As research progresses, an increasing number of pharmacologically active molecules derived from plants are being discovered, isolated, and characterized. This ongoing exploration not only validates the traditional use of these plants but also presents promising pathways for the development of new medicinal compounds. Leveraging the rich history of herbal medicine allows researchers to tap into a vast reservoir of naturally occurring molecules with medicinal potential, thereby advancing drug development efforts. The study of *Justicia adhatoda* exemplifies this approach, highlighting the importance of traditional knowledge in discovering and developing new therapeutic agents.

*Justicia adhatoda* stands out as a crucial medicinal plant with extensive applications in traditional and modern medicine. Its rich phytochemical composition, particularly the presence of vasicine, underpins its therapeutic efficacy, especially in treating respiratory conditions. The ongoing research and validation of its medicinal properties continue to affirm its significance, offering promising avenues for future drug development and

therapeutic interventions.



Figure 1. *Justicia adhatoda* plant

### **Medicinal Properties of *Justicia adhatoda***

*Justicia adhatoda*, is renowned for its extensive medicinal properties. This herb's leaves are particularly notable for containing the alkaloid vasicine, along with essential oils, making it highly effective in treating a variety of respiratory conditions such as asthma, bronchitis, colds, and coughs. The roots, leaves, and flowers of *J. adhatoda* are used extensively in Ayurveda for the treatment of respiratory ailments, including asthma and bronchitis. The plant has been utilized for thousands of years to manage both acute and chronic bronchial catarrh (B. Baniya et al., 2021). Additionally, the flowers are used to prepare Gulkand, a traditional Ayurvedic medicine, for treating tuberculosis. The leaves, flowers, fruits, and roots serve as

effective remedies for the common cold and whooping cough.

The plant parts of *Justicia adhatoda* exhibit anthelmintic properties, making them useful in treating parasitic worm infections. The leaf extract is recognized for its efficacy in treating glandular tumors, and it is also used to treat digestive disorders such as diarrhea and dysentery. Traditional Indian medicine employs different parts of the plant to address a range of health issues including rheumatism, swellings, eczema, malaria, joint pain, lumbar pain, and sprains (Manisha Pandey et al., 2016).

In Ayurveda and other traditional medicine systems, *Justicia adhatoda* is a well-regarded remedy for several conditions. In Sri Lanka, it is used to treat menorrhagia and various chest and respiratory tract infections such as whooping cough, chronic bronchitis, and asthma. It also serves as a sedative expectorant to alleviate excessive phlegm. The plant is employed to address sexual abnormalities, bleeding piles, and impotence, and it acts as an antispasmodic. In some regions, such as Gora village in Lucknow, Uttar Pradesh, India, the leaves are traditionally used by expectant mothers to induce abortions.

Recent research indicates that extracts of *J. adhatoda* have potent anti-tuberculosis properties (Sharma A. et al., 2018). Furthermore, homeopathy utilizes *J. adhatoda* to treat a variety of conditions, including fever, jaundice, whooping cough, asthma, spitting blood, colds, and coughs.

*Justicia adhatoda* is a versatile medicinal plant with a rich history of use in traditional medicine. Its wide range of therapeutic applications, particularly in treating respiratory conditions, highlights its importance in both traditional and modern healthcare practices. The ongoing research and validation of its medicinal properties continue to affirm its significance, offering promising pathways for the development of new therapeutic agents.

This plant is known for its various parts, including roots, leaves, flowers, and fruits, which contribute to its medicinal properties.

### Roots

In India, the application of fresh root paste to the abdomen and vagina just before childbirth is believed to facilitate a smooth delivery. In the Sitapur district of Uttar Pradesh, *Justicia adhatoda* paste has been traditionally used to treat tuberculosis, diphtheria, malarial fever, leucorrhoea, eye diseases, and acute nightfall. Additionally, the root extract is employed by the rural population to address diabetes, cough, and certain liver disorders. The root's decoction serves as an expectorant, antispasmodic, and anthelmintic agent, and is also used for treating gonorrhoea (Sharma A. et al., 2018).

### Leaves

The leaves of *Justicia adhatoda* have been formulated to treat a variety of conditions. These include leprosy, bleeding, hemorrhaging, skin conditions, wounds, and headaches. The infusion or solvent extract of the leaves has demonstrated high effectiveness in eliminating white ants, flies, and mosquitoes. Combining fresh leaf juice with honey and ginger juice effectively treats breathlessness, liquefies sputum, and addresses acute cough, chronic bronchitis, and asthma. An extract made by decocting the leaves of *Justicia adhatoda* and *Phyllanthus emblica* fruit, combined with honey, has been successful in managing asthma.

In Sri Lanka and India, crushed fresh leaves are used as a remedy for snake bites. In Bangladesh, macerated leaf extracts, yellow leaves, or smoke from dry leaves are used to prevent coughing and phlegm blockage during colds. In Myanmar and Pakistan, a leaf infusion is used to relieve headaches. Boiling leaf powder in sesame oil alleviates jaundice, earaches, and pus from the ears. Leaf juice is recognized as an

effective treatment for dengue-like viral fevers, postpartum hemorrhage, urinary problems, acidity, and belching. When combined with jaggery, it reduces excessive menstrual flow. Externally heated leaves are used to treat rheumatism, gout, fever, stomach cramps, constipation, and joint dislocations. The leaves and bark can be juiced to prevent vomiting (Sharma A. et al., 2018).



**Figure 2.** *Justicia adhatoda* leaves  
Flowers

The flowers of *Justicia adhatoda* are utilized to treat conditions such as gonorrhoea, high fever, cough, colds, phthisis, asthma, bronchitis, and coughing fits. They are recognized for their expectorant, antiasthmatic, and antiseptic qualities. Additionally, the flowers are known to enhance blood flow and alleviate tumultuous blood flow (Sharma A. et al., 2018).



**Figure 3.** *Justicia adhatoda* Flower  
Fruits

The fruits of *Justicia adhatoda* are seeded capsules containing four seeds. In Pakistan, the fruits are used as remedies for bronchitis, as antispasmodics, and for treating colds. They also serve as a laxative and are used to address fever, diarrhea, and dysentery (Sharma A. et al., 2018).



**Figure 4.** *Justicia adhatoda* Fruits  
Herbal Preparations

Several herbal preparations derived from *Justicia adhatoda* have been employed to treat various conditions. In Sweden, Spirote is used to alleviate symptoms of cold and occasional cough. Kan Jang is utilized to treat cold and cough symptoms. In Germany, Salus Tuss is prescribed for bronchitis, dry cough, smoker's cough, and asthma. In India, Ferniforte is used to treat leucorrhoea (Sharma A. et al., 2018).

### Discussion

*Justicia adhatoda*, commonly known as Malabar nut or Vasaka, is a plant with a rich history of use in traditional medicine. Its various parts, including roots, leaves, flowers, and fruits, exhibit a wide range of medicinal properties. However, alongside its therapeutic benefits, it is important to consider potential toxicity to lower living organisms such as fish and insects.

The roots of *Justicia adhatoda* are traditionally used to facilitate smooth childbirth and treat tuberculosis, diphtheria,

malarial fever, and other conditions. Meanwhile, the leaves have been employed to manage respiratory ailments, skin conditions, and headaches, among others. Additionally, the flowers and fruits of the plant have been utilized in treating various infections and disorders.

Despite its medicinal properties, *Justicia adhatoda* has been found to be harmful to fish, insects, and other lesser organisms. This selective toxicity underscores the complexity of its biochemical composition and necessitates careful consideration in its use and application.

Furthermore, research has uncovered additional medicinal properties of *Justicia adhatoda*, including its radioprotective, anti-cancer, anti-mutagenic, antitubercular, antipyretic, and anticholinesterase activities. These findings open up promising avenues for the development of new therapeutics targeting cancer, infectious diseases, and neurodegenerative disorders.

The radioprotective properties of *Justicia adhatoda* offer potential utility in protecting biological tissues from radiation-induced damage, particularly in cancer treatment. Its anti-cancer and anti-mutagenic effects suggest it may have a role in preventing and treating cancer and genetic disorders. Additionally, its antitubercular properties could provide a natural alternative or adjunct to conventional anti-tubercular drugs.

The antipyretic activity of *Justicia adhatoda* is significant, as fever is a common symptom of various diseases. By reducing fever, the plant could provide symptomatic relief and improve patient comfort. Moreover, its anticholinesterase properties may hold promise in the management of neurodegenerative diseases such as Alzheimer's.

## Conclusion

*Justicia adhatoda* emerges as a plant with immense potential in traditional and modern medicine. Its diverse medicinal properties make it a valuable resource for treating a wide range of ailments, from respiratory conditions to cancer and neurodegenerative disorders. However, its potential toxicity to lower living organisms underscores the importance of careful consideration in its use and application.

Further research is needed to fully understand the mechanisms of action, safety profile, and clinical efficacy of *Justicia adhatoda*. By harnessing its therapeutic potential while mitigating its potential toxicity, we may unlock new treatments and improve outcomes for patients worldwide.

## References

- 1.Sharma, A., & Kumar, A. (2016). Pharmacognostic studies on medicinal plants: *Justicia adhatoda*. *World Journal of Pharmaceutical Research*, 5(7), 1674-1704.
- 2.Chanu, W. S., & Sarangthem, K. (2014). Phytochemical constituents of *Justicia adhatoda* linn. found in Manipur. *Indian J Plant Sci*, 3(2), 19-21.
- 3.Pandey, M., Paul, V., Singh, P., & Ali, Z. (2016). Evaluation of nutritional composition and antioxidant activity of herbal leaves. *World J. Pharm. Pharm. Sci*, 5(8), 1396-1402.
- 4.Tiwari, A. K., Tiwari, A., & Singh, R. (2017). Quality Control and Pharmacological Studies of *Adhatoda vasica* Nees.
5. Jyoti Rani, J. R., Shikha Pandey, S. P., Kumavat, V. B., & Sharma, U. K. (2018). Role of *Adhatoda vasica* in management of respiratory disorders.

6.Hossain, M. A., Akhter, S., Sohrab, M. H., Afroz, F., Begum, M. N., & Rony, S. R. (2023). Applying an optimization technique for the extraction of antioxidant components from *Justicia adhatoda* leaves. *Eng Sci*, 24, 913.

7.Sharma, A., Bhardwaj, G., & Cannoo, D. S. (2018). Overview of phytochemistry and pharmacology of *Adhatoda vasica*. *health care*, 7(8), 9.

8.Baral, P. K., Roy, S., & Sultana, S. (2018). A review article on *Adhatoda vasicanees*: a potential source of bioactive compounds. *Int J Dev Res*, 8(11), 23874-23882.

9.Singh, A., Singh, S., Krishna, G., & Pandey, A. K. (2014). Traditional knowledge and ethnopharmacological perspectives of herbal medicine in India: a review. *J Med Plants Stud*, 2, 89-96.

10. Singh, A., Singh, S., Krishna, G., & Pandey, A. K. (2014). Traditional knowledge and ethnopharmacological perspectives of herbal medicine in India: a review. *J Med Plants Stud*, 2, 89-96.

11.Singh, K. J., & Huidrom, D. (2013). Ethnobotanical uses of medicinal plant, *Justicia adhatoda* L. by Meitei community of Manipur, India. *Journal of Coastal Life Medicine*, 1(4), 322-325..