

# Exploring the Dual Nature of Dhatura: Therapeutic Uses and Toxicity in Ayurveda

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**Abstract:** *Dhatura (Datura metel)* is a plant of significant importance in *Ayurveda*, particularly within the branch of *Agad Tantra*, which focuses on the identification and treatment of poisons. Known for both its medicinal properties and toxic effects, *Dhatura* contains alkaloids such as atropine, hyoscyamine, and scopolamine, which contribute to its pharmacological actions, including analgesic, anti-inflammatory, anti-asthmatic, and wound-healing effects. However, improper use of *Dhatura* can lead to poisoning, manifesting symptoms like confusion, hallucinations, delirium, and even death in extreme cases. In *Ayurveda*, *Dhatura* is classified as an *Upavisha* (mild poison) and is used in various formulations for treating ailments like asthma, cough, fever, inflammation, and neuralgia. The plant is also employed in formulations for conditions like *amlapitta* (acid dyspepsia), *shwasa* (asthma), and *krimi* (parasitic infections). Despite its therapeutic potential, the toxicological profile of *Dhatura* makes it a dangerous substance if consumed improperly. Accidental poisoning is common, especially from the seeds, which are often mistaken for edible seeds. The toxic effects of *Dhatura* include dryness of the mouth, dilated pupils, delirium, and hyperpyrexia. *Ayurvedic* antidotes such as cow milk with sugar, *Vrintaka* fruit juice, and *Nimbu Swarasa* are recommended for managing toxicity. This article provides an overview of the dual nature of *Dhatura*, emphasizing the need for caution and expert knowledge in its application for therapeutic purposes within *Agad Tantra* and *Ayurveda*.

**Keywords:** *Agad Tantra*, *Dhatura*, medicinal properties, poisoning, toxicity, *Upavisha*.

## INTRODUCTION

*Ayurveda* is one of the world's oldest healthcare systems, with references to medicinal practices scattered throughout the Vedic texts, notably the *Atharvaveda*. One of *Ayurveda*'s branches, *Agad Tantra*, focuses on the identification, classification, and treatment of poisons, including those from plants, animals, and minerals. *Dhatura*, an herb belonging to the Solanaceae family, is considered one of the *Upavisha* (subpoisons) in *Agad Tantra*<sup>1</sup>. Though toxic, it is widely utilized in *Ayurvedic* formulations due to its therapeutic properties. *Dhatura* contains potent tropane alkaloids such as atropine, scopolamine, and hyoscyamine. While its medicinal use is beneficial, improper use or overconsumption can lead to poisoning, affecting the central nervous system.

### Botanical Overview and Description

*Dhatura (Datura)* is a plant of considerable significance in both traditional medicine and in the natural world. Commonly known by names such as thorn apple, jimson weed, locoweed, or devil's weed, it is a member of the Solanaceae family, and its various species, such as *Datura*, *Datura atroxa*, and *Datura metel*, are found across different regions in India. In *Ayurvedic* medicine, *Dhatura* is revered for its healing potential, especially in treating respiratory conditions, pain relief, and even as an anesthetic. It is often used to address ailments like

asthma, cough, and some forms of fever, as it has antispasmodic and sedative properties. However, *Dhatura* carries a significant danger due to its toxicity. The plant contains several potent alkaloids, particularly atropine, scopolamine, and hyoscyamine, concentrated mostly in the seeds, making them highly toxic. These alkaloids can cause severe poisoning if consumed improperly, leading to symptoms like dilated pupils, dry mouth, hallucinations, and even death. As such, in *Ayurveda*, the use of *Dhatura* is very controlled, and its application is usually administered in minimal, carefully measured doses, often mixed with other herbs to balance its potent effects.

#### Plant Features:

- Root: The root system is cylindrical and brown, often spreading with lateral branches, anchoring the plant in the soil.
- Stem: The stem is erect, dark purple or black in color, cylindrical, and has short internodes.
- Leaves: The leaves are large, dark green, and have pointed margins, growing between 6 to 11 cm in length.
- Flowers: The flowers are large, bell or trumpet-shaped, and typically white or purple, contributing to the plant's striking appearance.
- Fruit: The fruit is a spiny capsule, round in shape, which contains 50-100 seeds that are light brown, flattened, and resemble chili seeds. In *Ayurveda*, *Dhatura* is considered a potent herb, used primarily in treating conditions related to excess mucus, respiratory issues, or inflammation. Despite its medicinal uses, the plant's high toxicity requires it to be used cautiously, typically under the supervision of an experienced practitioner. The toxic nature of the plant is well known, so it is rarely used in its raw form; instead, its preparations are carefully regulated.

#### Classical and Vernacular Names <sup>2</sup>

In *Ayurveda*, *Dhatura* is referred to by multiple names, including *Dhattura*, *Unmatta* (meaning delirium inducing), *Kanaka* (golden in nature), *Shivapriya* (beloved of Lord Shiva), and others. These names reflect its varied uses and effects on the human body. Some common synonyms are:

- Hindi: *Sada Dhatura*<sup>3</sup>
- English: Thorn Apple
- Telugu: *Ummetta*
- Tamil: *Ummattai*, *Umate*

- Marathi: *Dhotra*, *Dhatura*

#### Ayurvedic Properties of Dhatura<sup>4</sup>

1. *Rasa*: *Tikta* (bitter), *Katu* (pungent)
2. *Guna*: *Laghu* (light), *Ruksha* (dry), *Vyavayi* (penetrating), *Vikasi* (spreading)
3. *Veerya*: *Ushna* (hot)
4. *Vipaka*: *Katu* (pungent post-digestive effect)
5. *Prabhava*: Deliriant, *Madaka* (intoxicating)
6. *Doshagnata*: Primarily *Kaphavatashamaka* (pacifying *Kapha* and *Vata doshas*)

Therapeutic Actions: Pain-relieving, anti-inflammatory, antispasmodic, cardiogenic, and diuretic.

#### Therapeutic Uses<sup>5</sup>

- *Dhatura* has a wide range of medicinal applications, including treatment for:
  - Asthma
  - Cough
  - Fever
  - Inflammation
  - Edema
  - Neuralgia
  - Insanity
  - Myalgia
  - Hyperacidity
  - Dysmenorrhea

Its seeds are aphrodisiac, and its roots are traditionally used in the treatment of rabid dog bites. The leaves are used in poultices for conditions such as sciatica, lumbago, and painful swellings. Additionally, the leaf juice is applied externally for treating lice and skin diseases.

Mode of Action Mode of action of *Dhatura*, focusing on its primary active compounds: atropine and hyoscyine.

1. Active Compounds in *Dhatura*:
  - Atropine
  - Hyoscyine
2. Mechanism of Action:
  - Blocking Acetylcholine Receptors:
    - Atropine and Hyoscyine block acetylcholine receptors.
    - This leads to parasympatholytic or sympathomimetic actions.
3. Effect on the Central Nervous System (CNS):
  - Initial Stimulation:
    - These alkaloids initially stimulate the CNS.
  - Later Depression:

- They later cause CNS depression.
  - This depression particularly affects the respiratory center.
4. Effect on the Heart:
- Vagolytic Action:
    - The vagolytic action may stimulate the heart.

#### Common Formulations Involving Dhatura

*Dhatura* is used in various *Ayurvedic* preparations, such as:

- *Kankasawa*
- *Ekangvira Rasa*
- *Puspadhanwa Rasa*
- *Tribhuvana Kirti Rasa*
- *Laghu Vishgarbha Taila*

#### Toxicological Profile and Poisoning<sup>6</sup>

*Dhatura* is classified as a *Sthavara Vanaspatik Visha* (plant-based poison) in *Ayurveda* and a cerebral deliriant poison in modern toxicology. The fatal dose is approximately 60-100 seeds or 60-75 mg of atropine. Poisoning symptoms include:

1. Dry mouth and thirst
2. Dilated pupils, dry skin
3. Blurred vision (diplopia)
4. Agitation, hallucinations, delirium
5. Hyperpyrexia, convulsions
6. Urinary retention
7. Death from tachycardia, arrhythmias, and respiratory depression

#### Ayurvedic Antidotes for Dhatura Poisoning<sup>7</sup>

To treat poisoning, traditional *Ayurvedic* remedies include:

- Cow milk with sugar
- Juice of *Vrintaka* fruit
- *Karpasasthi* flower decoction
- *Nimbu Swarasa* (lemon juice)
- *Jiraka* (cumin) juice

#### Medico Legal Aspects

Poisoning due to *Dhatura* can be accidental or intentional. Accidental poisoning may occur from ingesting the seeds, especially by children, or from improper therapeutic use of atropine. *Dhatura* is occasionally used as a stupefying agent for theft, robbery, and kidnapping, where the seeds are mixed with food or beverages.

*Dhatura* is a plant with both potent therapeutic properties and significant toxicity. Its use in *Ayurveda* is well-documented, with applications ranging from the treatment of respiratory conditions to managing pain and inflammation. Despite its beneficial uses, the toxicity of the plant, especially its seeds, makes it a double-edged sword. Proper knowledge and careful administration are essential to avoid the dangers of poisoning. While modern research supports *Dhatura's* wide-ranging pharmacological actions, *Ayurvedic* practitioners must carefully balance its therapeutic benefits with its inherent risks.

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#### DISCUSSION AND CONCLUSION