

# A Review On Datura Plant

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**Abstract-** *Daturastramonium* is a plant that's used in medicine. It contains important chemicals like tropane alkaloids, amino acids, and others. The plant has many benefits, but it can be poisonous if not used properly. *Daturastramonium* is a plant used in traditional medicine worldwide. This article reviews its medicinal properties and the chemicals it contains, highlighting its potential uses and benefits. This plant has contributed various Pharmacological actions in the scientific field of Indian systems of medicines like analgesic and antiasthmatic activities. The present paper presents an exclusive review work on the Ethnomedical, phytochemical, pharmacological activities of this plant.

**Keywords-** Datura plant, Pharmacological actions

## I. INTRODUCTION

Plants have always been crucial in treating human illnesses and diseases globally.

- The demand for medicinal plants is rising in both developed and developing countries due to the growing recognition of natural products.
- Herbal medicine is a significant part of traditional and modern medicine systems.
- *Daturastramonium* is a well-known plant that's been used in traditional medicine for a long time.



Fig.1 Datura flower

- It grows wild and has beautiful flowers.
- People have been studying it to extract important medicines like atropine and scopolamine, which are used to treat various health issues.

- The plant contains special compounds called tropane alkaloids, which are responsible for its medicinal and psychoactive effects.

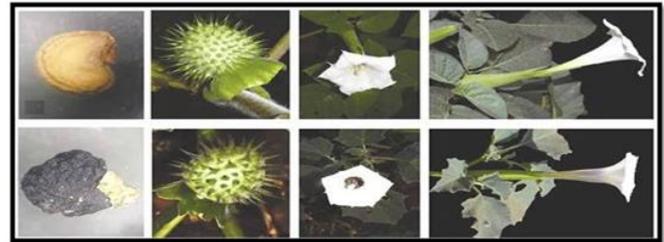


Fig.2 Datura fruit and flower

- These compounds have been used to treat various health issues, including pain, anxiety, and respiratory problems.
- Overall, the *Daturastramonium* plant is a valuable resource that has been used in traditional medicine for centuries. Its leaves and bark are used to treat a range of health issues, from respiratory problems to skin conditions.
- It's worth noting that while the plant has been used traditionally for these purposes, it's essential to consult a healthcare professional before using it or any other herbal remedy to treat a medical condition.
- This happened because people sometimes try to use the plant for recreational purposes or to get a "high", not realizing how toxic it can be.
- These incidents are relatively rare, but they're a reminder of the plant's potential dangers.
- The *Daturastramonium* plant has some medicinal uses, but it's also very poisonous. Here are some of its uses:
  - I. Reduces inflammation: All parts of the plant can help reduce swelling and inflammation.
  - II. Relieves respiratory issues: It can help open up airways and relieve congestion.
  - III. Treats infections: It's used to treat dental and skin infections.
  - IV. Relieves toothache: The plant is used to treat toothache pain.
  - V. Stimulates the nervous system: It can stimulate the central nervous system.
- However, the plant is also hallucinogenic and can cause serious poisoning. If someone eats any part of it, they

might experience severe symptoms like:- Confusion, Dizziness, Hallucinations, Delirium, Seizures, Coma.

- These symptoms occur because the plant contains toxic chemicals that can block normal brain function. Medical professionals might find it challenging to diagnose poisoning cases because the symptoms can mimic other conditions.
- The berries of the Daturastramonium plant are particularly poisonous, and eating them can be deadly. If someone eats around 125 seeds, it can cause heart failure and death.
- The seeds have a high concentration of toxic chemicals and act quickly.

#### Regional And Other Names :-

- Sanskrit: Umatta-virkshaha
- English: Thornapple
- Hindi: Sadah-Datura, Safed Datura
- Tamil: Umatai
- Arab: Jonz-masal
- Gujrat: Dhatoria
- Bengali: Dhattura
- Malayalam: Maraummam
- Marathi: Kanaka

#### Scientific Classification of D. Stromonium :-

- Kingdom: Plantae
- Division: Magnoliophyta
- Class: Magnoliopsida
- Order: Solanales
- Family: Solanaceae
- Genus: Datura
- Species: Daturastromon



Fig. 4 Datura flower

#### Botanical description:-

- D. stramonium is an annual plant that grows up to 1 meter tall when cultivated. Its stem is greenish-yellow, sturdy, and branched, with a smooth texture and some light hair.

- The branches grow in a forked pattern, and the plant has big leaves. It produces trumpet-shaped flowers that can be white or purple, adding to its unique appearance.
- The leaves are big, oval-shaped, and pale green with a hairy texture. They have a stalk and are 4-6 inches long.
- The veins on the leaves are a darker color, and the edges have teeth-like notches.

#### Phytochemicals :-

- Daturastramonium contains important chemicals called tropane alkaloids, mainly hyoscyamine and scopolamine.
- Some of these chemicals, like 6 -ditigloyloxytropene and 7-hydroxyhyoscyamine, were recently discovered in the plant.
- The plant D. Stramonium contains two important chemicals, hyoscyamine and scopolamine.
- Researchers have studied how these chemicals are distributed in different parts of the plant and at different stages of its growth.
- Young D. Stramonium plants have the highest amounts of hyoscyamine and scopolamine in their stems and leaves, with hyoscyamine being the main component.
- These chemicals are used in medicines because they have anticholinergic properties, meaning they can affect the nervous system.
- D. Stramonium contains several alkaloids, including atropine, hyoscyamine, and scopolamine, which are used in various medical applications.

**Pharmacological activity :-**Systems of medicines. The plant as a whole possesses Remarkable biological activities which are summarised Below.

#### Antibacterial Activity:-

- The leaf extract of Daturastramonium exhibits Antibacterial activity.
- The leaves of Daturastramonium have antibacterial properties, especially against certain types of bacteria like:
  - - Salmonella typhii
  - - Pseudomonas aeruginosa
  - - Proteus vulgaris

It's moderately effective against:

- - Klebsiella pneumonia
- - Staphylococcus aureus
- Escherichia coli.
- The extract of Daturastramonium has been shown to be effective against a range of bacteria, including both Gram-positive and Gram-negative types.
- Its antimicrobial activity increases with the concentration of the extract, making it a potent natural remedy against various bacterial infections.

**Nematicidal Activity:**-Nidhi et al reported the efficient nematicidal activity of Theaqueous extract prepared from the leaf of DaturaStramonium.

**Antifungal activity:**-It was reported that the leaf extract of DaturastramoniumWas found to exhibit excellent antifungal activity.

- A mixture made from Daturastramonium, Calotropisgigantea, Azadirachta indica (neem), and cow manure has strong antifungal properties.
- This was discovered by K. Usha and others. The mixture, as well as extracts from these plants using methanol and water, can effectively fight against a type of fungus called Fusariummangiferae.

**Contact toxicity:**-The extracts from the leaves and seeds of Daturastramonium can kill Triboliumcastaneum, a type of insect, when they come into contact with it.

**Anticancer activity:**-Ahmad and his team tested Daturastramonium leaf extract on human cancer cells from:

- Breast cancer (MDA-MB231)
- Head and neck cancer (FaDu)
- Lung cancer (A549)

They treated these cells with the extract for 1-2 days and found that it:

- Killed cancer cellsCaused oxidative stress (damage) to the cells.
- When the cancer cells were exposed to the Daturastramonium extract for 2 days, it killed them. All types of cancer cells were affected, but some were more sensitive than others.
- Daturastramonium can be very dangerous if not used properly. It can cause:
  - - Vomiting
  - - High blood pressure
  - - Loss of consciousness (leading to coma)

**Antiasthmatic activity :-D.** Stromonium in asthma treatment and possible effectOn prenatal development was studied.

- If a pregnant woman uses Daturastramonium for asthma, it can harm her unborn baby. The baby's brain and nervous system may be affected, causing permanent damage.
- This is because the Datura can affect the baby's development and lead to problems.
- So, be careful when using this plant medicine if you're pregnant .

**Anti microbialactivity:-**Mukesh et al studied on the antimicrobial activity ofcombined crude ethanolic extract of Daturastramonium, Terminalia arjuna and Withaniasomnifera in cup plate diffusion method for antibacterial and the antifungal activity.

- The extracts were subjected to screening to detect potential antimicrobial activity against the Staphylococcus aureus, Bacillus subtilus, Escherichia coli, K. pneumonia, M. luteus and C. albicans comparing with Ciprofloxacin standard drug.
- Minimum inhibitory concentrations (MIC) of the extracts were also be determined against the four selected microorganisms showing zones of inhibition =10mm.
- The plant extracts, made with water and alcohol, showed strong pain-relieving and anti-inflammatory effects. They were tested using various methods, including hot plate, tail immersion, and tail clip tests, and proved effective against different types of pain and inflammation caused by heat, chemicals, and physical stimuli.
- The results were significant, indicating that the extracts have promising medicinal properties.

**Anticholinergic activity :-**Daturastramonium contains chemicals called alkaloids that can affect the brain and body.

- These chemicals have medical uses, but they can also be misused and are poisonous if taken incorrectly.
- People and animals have been accidentally poisoned by eating parts of the plant.
- If someone eats jimson weed, they might experience:
  - 
  - - Dry mouth and thirsty
  - - Dry skin
  - - Blurred vision and big pupils
  - - Can't pee
  - - Fast heartbeat
  - - Feeling confused, restless, or hallucinating
  - - Might even lose consciousness.

- It blocks a chemical in the brain and body, causing bad effects. This chemical helps control things like heart rate, digestion, and thinking.
- When it's blocked, it leads to symptoms like confusion, dry mouth, and fast heartbeat.

Human Cancer Cells, Jordan Journal of Biological Sciences. 2(1); 2009: 9-14.

- [14] Sharma M C and Sharma S, Phytochemical, Preliminary Antimicrobial Evaluation of Combined Crude Aqueous Extract. International Journal of Microbiological Research. 1(3); 2010: 166-170.

### REFERENCES

- [1] Kirtikar JD, Basu BD. Indian medicinal plants. Allahabad: LalitMBasu; 1994, p. 1229-1231.
- [2] Parashuram M. Isolation of 11,12,13,17-Tetrahydro(Hydroxymethyl)-10-Nitrodtriacontahydrospiro[Inden5,6 A] Hexacene-2,2'-Pyran]=3,6(1H,18bh) Dione and its Spectroscopic characterization and biological activities of Bimetal from seeds of *Daturastramonium*. Asian J Bioch Pharm Res 2011; 3(1): 501-506.
- [3] Das S, Kumar P, Basu SP. Review article on phytoconstituents and potentials of *Daturastramonium* linn. J Drug Del therap 2012; 2(3): 4-7.
- [4] Shagal MH, Modibbo UU, Liman AB. Pharmacological for the ethnomedical use of *Daturastramonium* bark extract in treatment of diseases caused by some bacteria. Int Res Pharm Pharmacol 2012; 2(1): 16-19.
- [5] Pretorius E, Marx J. *Daturastramonium* in asthma treatment: possible effects on prenatal development. Environ Toxicol Pharm 2006; 21(3): 331-337.
- [6] Balachandran P, Rajgopal G. Cancer—an ayurvedic Pharm Res 2005; 51(1): 19-30.
- [7] Boumba A, Mitselou A, Vougiouklakis T. Fatal poisoning from *Daturastramonium* seeds. Vet Human Toxicol 2005; 46: 81-82.
- [8] Diker D, Markovitz D, Rothman M, Sendovski U.
- [9] Coma as a presenting sign of *Daturastramonium* seed tea poisoning. Eur J Int Med 2007; 18(4): 336-338.
- [10] Taha SA, Mahdi AW. *Datura* intoxication in Riyadh. Trans R Soc Trop Med Hgy 1984; 78: 134-135.
- [11] Sharma N and Trivedi PC, Screening of Leaf Extracts of Some Plants for Their Nematicidal and Fungicidal Properties Against *Meloidogyne incognita* and *Fusarium oxysporum*. Asian Journal of Experimental Science. 16; 2002: 21-28.
- [12] Usha K, Singh B, Praseetha P, Deepa N, Agarwal DK, Agarwal R, Nagaraja A. Antifungal activity of *Daturastramonium*, *Calotropis gigantea* and *Azadirachta indica* against *Fusarium mangiferae* and malformation in mango, European Journal of Plant Pathology. 124; 2009: 637-657.
- [13] Ahmad IM, Abdalla MY, Mustafa NH, Qnais EY and Abdulla FA. *Datura* Aqueous Leaf Extract Enhances Cytotoxicity via Metabolic Oxidative Stress on Different