



## Ativisha (*Aconitum heterophyllum* wall): A unique drug in ayurveda

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### Abstract

Ayurveda is a traditional medical system present in India since 2000 B.C. Medicinal plants forms a major part of treatment in Ayurvedic and also in different ancient healing systems around the world. In India, most of the rural population depends on herbal medicines in primary health care level. Ativisha (*Aconitum heterophyllum* wall) of Ranunculaceae family is an Ayurvedic herb that is used extensively in Ayurveda. In Charaka Samhitha, it has been mentioned in management of obesity, piles, stomach disorders etc... In Sushruta Samhitha, it has been mentioned in the management of diarrhea. Many phytochemical constituents (metabolites) are obtained from this plant, like diterpene alkaloids which is having analgesic and anti-inflammatory activities. Various literature were screened and the relevant items were considered for a constructive review of the drug.

**Keywords:** *Ativisha*, ayurveda

### Introduction

Ayurveda is a specialized medical system, which is grounded on the concept of body, mind and soul. In Ayurvedic medicine, treatment of diseases is done by natural methods and also by medicinal plants and this makes it so special. The fundamentals of Ayurvedic treatment is to remove the causative factors of the disease instead of suppressing just the symptoms. *Aconitum heterophyllum* also known as Atis, is an herb seen within the temperate and alpine regions of Himalayas. The tuber of *Ativisha* is extremely healthy and widely utilized in Ayurveda. In Charaka Samhitha, it has been advised for treating obesity, hemorrhoids, abdominal disorders etc... In Sushruta Samhitha it has been advised as a remedy against loose bowels.

**Habitat:** *Ativisha* is found in the Himalayan Mountains from Kumau to Hasora, surrounding areas of Shimla and Chamba at around 6 to 15 thousand feet height [1].

### Scientific classification of *Aconitum Heterophyllum*

**Kingdom:** Plantae

**Sub kingdom:** Tracheobionta

**Super division:** Spermatophyta

**Division:** Magnoliophyta

**Class:** Magnoliopsida

**Subclass:** Magnoliidae

**Order:** Ranunculales

**Family:** Ranunculaceae

**Genus:** *Aconitum*

**Species:** *Aconitum heterophyllum*

### Classification according to Bhruhatrayi, Laghutrayi and Nighantu

1. Caraka Samhita- *Lekhaneeya* (has scraping action on tissues and Kapha), *Arshoghna* (treating hemorrhoids) [2]

2. Sushrut Samhita- *Sirovirechana* drug group (clearing morbid *Doshas* from head and neck) [3]
3. Astanga Sangraha- *Pippalyadi*, *Vacadi*, *Lekhaniya*, *Arsoghna* (*Prativisha*- A type of *Ativisha*) [4]
4. Astanga Hridaya- *Ativisha* is listed under the *Vacaharidradi*, *Vatsakadi Gana* [5].
5. Dhanvantari Nighantu- *Guduchyadi Varga* [6]
6. Kaiyadeva Nighantu- *Oshadhi Varga* [7]
7. Bhava prakash Nighantu- *Haritakyadi Varga* [8]
8. Priya Nighantu- *Shatapushpadi Varga* [9]

**Synonyms:** *Suklakanda*, *Bhangura*, *Ghunavallabha*, *Kasmira*, *Shishubhaishajya* [10]

**Regional names of *Ativisha*:** Hindi- Atis, Marathi, Gujarati - *Ativish*, Punjabi-Batis, Tamil-*Ativididyam*, Telugu - *Atibasa*, Bengali- *Ataich* [11].

### Varieties

Asthang Sangraha- *Ativisha* and *Visha* [12]

Madanadi (Madanpal Nighantu) - *Rakta*, *Sveta*, *Krishna*, *Pita* [13]

Dhanvantari Nighantu - *Ativisha* (*Sveta Kanda*) and *Pravisha* (*Shyam Kanda*) [14]

Raj Nighantu- *Shukla* (*Shweta*), *Krishna* and *Aruna* [15]

**Abhava Pratinidhi Dravya (Drug substitution):** Substitute drugs are selected on the basis of similarity in *Rasa*, *Guna*, *Virya*, *Vipaka* and mainly the *Karma*. *Musta* (*Cyperus rotundus* Linn.) is used for substitution drug for *Ativisha* [16].

### Botanical Description

#### Morphological characters

Perennial, vertical herb grows up to 1.2 m tall, Roots are biennial, paired and have tubers. Tubers are cylindrical or conic, around 3-6 cm long with scarce root fibers and thin

bark. Stems are erect, simple and branched. They grow 15–20 cm high, is glabrous below and also finely pubescent within the upper part. Leaves are 5-10 cm, acute, sharply toothed, ovate, upper amplexic and lower possessing long petioles. Colors of flower are azure to aqua with purplish veins in panicles. Flowering and fruiting season of *Ativisha* is May- October<sup>[17]</sup>.

### Microscopic characters

The microscopic study of (Debashish Paramanick et.al 2017) *Ativisha* showed single layered epidermis containing light-brown tabular cells rupturing on formation of cork, 5 - 10 rows of tangentially elongated and thin-walled cells. Cork cambium single layer consisted of tangentially elongated, thin-walled cells and much wider cortex consisting of tangentially elongated or rounded, thin-walled parenchymatous cells with intercellular spaces, cells<sup>[18]</sup>.

### Chemical constituents

*Aconitum heterophyllum* contains chemicals like atisine, atidine, histisine, hetidine, heterophyllisine, heterophylline, heterophyllidine, heterastine, dihydroisoatisine, isoatisine, hetisinone, benzoyl heteratisine, benzolmesaconine, lactone-atisenol, 14-anisoylaconine, aconitine, mesaconitine, jesaconitine, hypaconitine (root);  $\beta$ -sitosterol,  $\beta$ -carotene, isoatisine (rhizome); heterophylloidine, aconitine, veratrine, 6-acetylheratisine, 6-benzoylheratisine (plant)<sup>[19]</sup>.

Alkaloids, carbohydrate, proteins and amino acids, saponins, glycosides, quinones, flavonoids, terpenoids are present in the leaf, root and stem of *Aconitum heterophyllum*.

### Pharmacodynamics of Ativisha

*Rasa- Tikta* (bitter) and *Katu* (pungent) taste

*Guna- Laghu* (light) and *Ruksha* (dry) properties

*Virya- Ushna Veerya* (hot potency)

*Vipak- Katu Vipaka* (attains pungency after digestion)<sup>[20]</sup>

### Properties

*Ativisha* having properties like *Kapha-Pittahara*, *Dipana* (increases digestive fire), *Pachana* (digests undigested material), *Shotahara* (anti-inflammatory), *Vishaghna* (anti-poisonous), *Krimihara* (anthelmintic), *Jwarahara* (antipyretic), *Kasahara* (antitussive) *Grahi* (prevents water loss from the body), *Arshoghna* (antihemorrhoid) and *Ati-Saraghna* (anti-diarrhoeal)<sup>[21]</sup>.

### Action of Ativisha

*Ativisha* is non-poisonous, antiperiodic, anti-inflammatory, astringent, tonic, febrifuge and antispasmodic.

### Therapeutic uses

#### Internal uses

1. *Ativisha* is known hepatoprotective, antipyretic, analgesic, Antioxidant, anti-flatulent, anti-periodic and carminative properties. By taking *Ativisha* with dried ginger, Bel fruit or nutmeg powder, it works effectively in diarrhea<sup>[22]</sup>.
2. *Ativisha* works in hypertension effectively. *Ativisha* aqueous pulp which has especially atisine as its main component produces hypotensive results. It is good for infants and children against gastrointestinal fever<sup>[23]</sup>.

3. *Devadarvyadi Kwath* which contains *Devadaru*, *Ativisha*, *Vacha*, *Musta* and *Haritaki* is used in treatment of all types *Atisara* (Diarrhea)<sup>[24]</sup>
4. In worm infestation *Ativisha* is given with *Vidanga*<sup>[25]</sup>.
5. *Ativisha* with *Indrajaya* and bark of *Kutaj* with *Madhu* or rice water is used in *Pittaja Atisara*<sup>[26]</sup>.
6. Decoction made by *Ativisha* along with *Bilva*, *Mocarasa*, *Lodhra*, *Dhataki* and *Amra* seed are used in severe diarrhea<sup>[27]</sup>.
7. In *Grahani* treatment, decoction made from *Ativisha*, *Sunthi* & *Musta* is given orally to reduce the *Ama*<sup>[28]</sup>.
8. *Ativisha* root is made into paste by grinding with honey and administered orally in *Mushika Visha*<sup>[29]</sup>.
9. In case of cough, vomiting and fever, *Ativisha* is given with honey or with *Karkakangi* and *Pippali*<sup>[30]</sup>.
10. Ghee prepared with *Ativisha* is used orally or as nasal drops in case of acute poisoning of *Nasya* and *Dhooma*<sup>[31]</sup>.

### External Uses

1. It is used as an anodyne liniment in neuralgia along with other types of pain<sup>[32]</sup>.
2. *Ativisha* seeds are grinded in honey and applied to the throat in tonsillitis. Taking incense roots through the nose is useful in headaches, especially migraines<sup>[33]</sup>.
3. In the treatment of *Vrana* (Wound) *Syonaka*, *Prativisa* (Type of *Ativisha*), *Kantakari mūla* are made into paste and applied over the wound<sup>[34]</sup>.

### Therapeutic Uses according to Nighatus

1. Bhavapraksha Nighantu: *Ativisha* use in treatment of *Atisara* (diarrhea), *Kasa* (Cough), *Krimi* (Worm), and *Chardi* (Vomiting)<sup>[35]</sup>.
2. Raj Nighantu: *Ativisha* is *Katutikta* in *Rasa*, *Ushna Virya*, *Kapha Pitta Nashak*, relive the *Pitajajwar*, *Amatar*, *Kasa* (Cough) and *Chardi* (Vomiting)<sup>[36]</sup>.
3. Dhanvantari Nighantu: *Ativisha* is *Katu-Tikta* in *Rasa*, *Ushna Virya*, *Vata-Kapha Nashak*, relive the *Jwar*, *Amatar*, *Kasa* (Cough), and *Chardi* (Vomiting)<sup>[37]</sup>.
4. Kaidev Nighantu: *Ativisha* haing *Tikta* in *Rasa*, *Ushna Virya*, *Laghu*, *Agnidipak*, *Pachak*, *Pitta-Kapha Nashak*, relive the *Amadosha*, *Kasa* (Cough), *Krumi* and *Chardi* (Vomiting)<sup>[38]</sup>.

### Pharmacological Study on Ativisha

1. Root Extract of *Aconitum heterophyllum* (225, 450 and 900 mg/kg p.o) showed anti-inflammatory activity in cotton pellet-induced granuloma in rats<sup>[39]</sup>.
2. *Aconitum heterophyllum* root had shown antioxidant and nephroprotective activities<sup>[40]</sup>.
3. *A. heterophyllum* methanol portion shows latent hypolipidemic activity<sup>[41]</sup>.
4. Alcoholic extract of *A. heterophyllum* tubers showed antidiarrheal activity of in castor oil induced diarrhea and gastric transit time in mice<sup>[42]</sup>.
5. *A. heterophyllum* root showed antisecretory and antimotility effect, which arbitrates through nitric oxide path way<sup>[43]</sup>.
6. Pharmacological studies on the root tubers of *A. heterophyllum* showed its anti-diarrheal, anti-helminthic and antihyperlipidemic properties<sup>[44]</sup>.
7. *Aconitum heterophyllum* roots have antioxidants and it showed hepatoprotective activity<sup>[45]</sup>.

### Clinical study on *Ativisha* and compound drug

1. Syrup Vachadi Yoga contains *Ativisha* and this syrup was effective in *Atisara* [46].
2. *Ativisha* has Anti-inflammatory, anti-pyretic, anti-diarrhoeal activities [47].
3. *Pathadya Churna* has *Ativisha* and this *Churna* was effective in treatment of *Grahani roga* [48].
4. Researchers report that *A. Heterophyllum* holds antifungal cytotoxic, antiviral and immune-stimulant properties [49].

### Important Formulations of *Ativisha*

*Balachaturbhadrika Churna* [50], *Lodhrasava* [51], *Lakshminarayana Rasa* [52], *Rasnairandadi Kashaya* [53], *Sudarshana Churna* [54], *Panchatikta Guggulu Ghrita* [55].

### Side-effects of *Ativisha*

*A. heterophyllum* is the only non-toxic species with therapeutic potential. Its heavy doses of around 5-6 gm causes dryness in throat (*Galshosh*), tremors (*Kamp*) and symptoms of *Vataja Dosha* [56].

### Purification Process

After sipping in *Gomayaras*, it is purified by washing and taking it dry in the sun [57].

### Discussion

*Ativisha* mentioned in classical texts are found highly useful in treating sizable number of various ailments. Classical texts have mentioned its properties briefly, however, this drug is used in various formulations. *Aconitum Heterophyllum* (*A. Heterophyllum*) is the main ingredient in many Ayurvedic formulations and is also used in Chinese and Bhutanese herbal medicines. Alkaloids are present in roots, of which atisin is 0.4% which is far less toxic than aconitine and pseudo aconitine. The plant possesses potent immune-stimulant properties. Most species of *aconitum* are very toxic due to the presence of its bound phyto-constituents. The phytochemical constituents of *Ativisha* however helps in balancing its toxic properties when made into medicinal form. *Ativisha* had pharmacological activities like anti-inflammatory, antipyretic, antibacterial, antiperiodic and is utilized in cough, diarrhea and dyspepsia, is used after fever and utilized in irritability of stomach and abdominal pains. Modern studies had shown that *A. heterophyllum* has good antimicrobial activity against gram-negative bacteria. The Ayurvedic Pharmacopoeia of India advises the use of the dried, tuberous root in emesis and helminthiasis along with other therapeutic applications. The Ayurvedic literature suggests the utilization of *musta* (*Cyperus rotundus*) as a *pratinidhi dravya* (substitute) for *Ativisha* (*Aconitum heterophyllum*). *A. heterophyllum* and *C. rotundus* possess anti-inflammatory, antipyretic, antibacterial and anti-diarrheal properties. It is noticeable that while *Veerya* is totally different, the biological properties of *Ativisha* and *Musta* square up pretty well. This is further supported by pharmacologic studies, which showed that, *A. heterophyllum* as well as *C. rotundus* have antidiarrheal, antipyretic, anti-inflammatory, anti-hyperlipidemic. *Ativisha* is probably not dangerous for lactating mothers also. When *Stanya* is affected with *Kapha*, it may be used to suppress the same. Due to *Kapha*, *stanya* becomes very heavy and it may cause unnecessary secretion

and vomiting in infants. In such cases, *Ativisha* powder may be used by mothers.

### Conclusion

This article presents a comprehensive review of literature on *Ativisha*. *Ativisha* is used effectively and safely in Ayurveda as well as in many traditional health systems. It has several medicinal properties *viz.* alexipharmic, anodyne, anti-atrabilius, anti-flatulent, anti-periodic, anti-phlegmatic, carminative, anti-oxidative, anti-inflammatory, and expectorant properties. This plant when judiciously used will be useful to treat many conditions.

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