



RESEARCH ARTICLE

A TOXICOLOGICAL REVIEW OF VATSANABHA (ACONITUM FEROX)

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ABSTRACT

Vatsanabha (Aconitum ferox) is one of the deadly poison categorized under the *Mahavisha* (by *rasatarangini*) and *Sthavara visha* (by *sushrut and charak*). It is a common drug indicated therapeutically for the management of various disease like *Pleehodara* (Splenomegaly), *Kushtha* (Skin disease), *Pandu* (Anemia), *Jwara* (fever), *Amavata* (Rheumatoid arthritis), *Abhishyanda* (Conjunctivitis) etc. As *Acharya Charak* mentioned that even poison in small amount acts like a nectar. So It is use in various medicinal formulations after proper purification. The use of impure *vatsanabha* may results in toxic effects like burning in whole body, unconsciousness, inhibition in heart rate, death etc. Modern toxicology also describes manifestation, treatment, autopsy findings and medico-legal points of *Aconitum ferox*. So this review helps us to understand the therapeutic and toxicological aspect of *Vatsanabha* (*Aconitum ferox*) as per *Ayurveda* and Modern toxicology.

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INTRODUCTION

Agad tantra is the branch of *Ayurveda* in which the diagnosis and management of various poisoning such as snakes, insects, spiders, rats bite and also other poisonous substances like plants and minerals are described (Kaviraj Ambikadutta Shastri, 2003). In modern medicine *Agad tantra* is named as toxicology, the science dealing with properties, action, toxicity, fatal dose, detection, estimation, treatment and autopsy finding (in case of death) in relation to the poisonous substances. A poison is a substance which when administered, inhaled or ingested is capable of acting deleteriously on human body. There is no bounding between a medicine and poison, for a medicine in a toxic dose is a poison and a poison in a small dose may be medicine (Gautam biswas, 2015). *Vatsnabha* is a one of the deadly poison that is widely used therapeutically in the form of *Ayurvedic* formulations to cure various diseases. It is a deciduous perennial plant of 2 to 6 feet height with dark green digitate leaves and an erect terminal spike of blue helmet shaped flowers hence called monk's hood. No other plant is grow near it. It is a cardiac poison belonging to family Ranunculaceae and growing in eastern temperate and sub-alpine regions of the Himalayas, eastwards of Uttarakhand, Nepal, Kashmir and Sikkim.

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All parts of the plant are poisonous but the root being most potent. The root is mostly used for medicinal purpose. Its dry root is conical or tapering in shape, usually shrivelled and has longitudinal wrinkles. It is 5-10 cms long and 1-2 cms thick at the upper extremity and dark brown externally. It has no odour but somewhat sweetish taste which gives it the name *Mitha bish* (Krishanvij, 2012).

MATERIALS AND METHODS

The article is based on review of different *Ayurvedic* and modern texts and research papers. Material related to *Vatsnabha* (*Aconitum ferox*) has been collected from different *Ayurvedic* books, journals and various websites related to it.

Toxicological review as per ayurveda

Synonyms: *Vish*, *Amrita* (Acts as nector if used in suitable dose after purification), *Kshved*, *Garala*, *Stokaka*, *Pranahara*, *Marana*, Naag (Sharma, 2008).

Classification

- *Charak samhita- Sthavar vish* (poisonous plant) (Kashinath Shastri, 2016).
- *Sushurut samhita- Kanda vish* (Tuber poison) (Kaviraj Ambikadutta Shastri, 2003)

- *Ras-shastra- Mahavisha* (Siddhi Nandan Mishra, 2008).

Vernacular name (Sharma, 2011)

Sr. No.	Language name	Synonyms
1.	Assamese name	Vish
2.	Bengali name	Kathvish, Katvish, Mitha vish
3.	Bihari	Dakara
4.	English	Aconite, Monk's hood
5.	Gujarati	Bachanaag
6.	Hindi	Meetha vish, Meetha Teliya, Bachnaag
7.	Kannada	Vatsanabhi
8.	Marathi	Bachnag
9.	Punjabi	Mohri, Shayam mohair
10.	Tamil	Vasnavi
11.	Telgu	Nabhi, Vasnabhi

Appearance of Vatsanabha plant (Pandit Kashinath Shatri, 2014 and Sharma, 2008)

The leaves of *vatsanabha* plant are resembles to the leaves of *sindubar* and present in group of five. Size of roots are just like the size of goat's umbilicus of and no other plants are survives near the plant and height of its plant is nearby two hands (*Dvihasta*).

Appearance of useful (Graahya) Vatsanabha Kand (Pandit Kashinath Shatri, 2014)

For medicinal purpose it's tuber should be thick (*Sthool*), smooth (*Snigdha*), heavy (*Guru*), new (*Nava*), Taken after the ripening of fruits and Should be free from insect bites. The roots should be collected in the season of winter (*Sheet ritu*) and autumn (*Basant ritu*, means between the month of December to march), because in this period roots are more potent and effectives

Types of Vatsanabha (Pandit Kashinath Shatri, 2014)

According to *Rasatarangini* there are three types of tuber on the basis of colour (*varn*)

- *Krishnabh* (blackish in colour)
- *Kapisha* (yellowish-brown)
- *Paandu* (yellowish white)

(In properties of *vatsanabha*, *Kapisha* is better then *krishnabha* and *paandu* is better then *kapisha*)

Ayurvedic pharmacological properties (Sharma, 2011)

Guna (Physical properties)	<i>Laghu</i> (Light), <i>Teekshan</i> (Sharp), <i>Vyavayi</i> (Piercing), <i>Vikasi</i>
Rasa (Taste)	<i>Madhur</i> (Sweet)
Virya (potency)	<i>Ushan</i> (Hot)
Vipaak (Metabolic properties)	<i>Madhur</i> (Sweet)
Effect on Tridosha	<i>Tridoshaghna</i> (balance all the three doshas, mainly balances <i>vata</i> and <i>kapha dosha</i>)

Toxic effect of vatsanabha

- According to *Acharya sushruta* it produces toxic effect as torticollis (neck stiffness) and yellow discolouration of stool, urine and eyes (Kaviraj Ambikadutt Shastri, 2012).
- As per *Rastarangini* due to intake of unpurified *vatsanabha* it produces burning in whole body (*Daha*), unconscious/syncope (*Moha*), inhibition of heart rate

(*Hridgatirodhan*), death (*Mrityu*) (Pandit Kashinath Shatri, 2014).

- Text-book of *Rasaratna samucchaya* explains 8 stages of toxic effect of *vatsanabha* and these stages refers to spreading of poison in different parts of body. These stages are also dependent on level of toxicity and dosage of *vatsanabha*. These are following (Dr.Indradev Tripathi, 2013).

STAGE	SYMPTOMS
1 st	<i>Twaka vikar</i> (skin problems)
2 nd	<i>Vepathu</i> (tremors)
3 rd	<i>Daha</i> (burning sensation)
4 th	<i>Indriya vikar</i> (disturbance of sense organs)
5 th	<i>Fenodgati</i> (mouth frothing)
6 th	<i>Skanda bhang</i> (severe pain and fatigue of shoulders)
7 th	<i>Jadyata</i> (stiffness)
8 th	<i>Marana</i> (finally causes death)

Purification of Vatsanabha

Poisonous plants are subjected to purification process (*shodhana sanskara*), before its therapeutic use. This process reduces toxicity of poisonous plant considerably and keeps it to required optimum level. As we mentioned the toxic sign & symptoms of *vatsanabha* above, so we can use following method of its purification

- Roots of *Vatsanabha* are cut down into the small pieces and tied into the piece of cloth and suspended into cow's urine for three consecutive days and then exposed to sunlight. Every day the urine is replaced by fresh urine. By this process *Vatsanabha* becomes pure (Pandit Kashinath Shatri, 2014).
- *Vatsnabha* roots are cut down in small pieces and boiled in cow's milk or buffalo's milk or goat's milk by the method of *pottaly sweda* in *Dola yantra* for three hours. By these methods it becomes pure (Pandit Kashinath Shatri, 2014).
- Pieces of *Vatsanabha* roots are covered with a cotton cloth which is dipped into red mustard (*rakta sarshap*) oil and kept for three days. After three days this *vatsanabha* root in powder form is well mixed (*mardan*) with *tankana* in *kharala*. By this method *vatsanabha* powder becomes pure (Siddhi Nandan Mishra, 2008).

Treatment of vatsnabha poisoning

If due to over dose of *Vatsanabha* or its formulations and usages of it's in improper manner or without purification toxic symptoms appears, following preparation should be given

Sr.No.	According to	Formulations
1	Anandkand ^[19]	<ul style="list-style-type: none"> • <i>Tankan</i> 1 to 2 nishka along with 4 times <i>ghee</i> • <i>Tanduleeyaka svaras in 1 pala matra</i> • <i>Putrakjeevaka phal-majja in 1 nishka pramana</i> • <i>Tuttha in panadvaya matra</i> (8 gm) along with <i>Nara-</i> • <i>mootra</i> (male urine)
2	Brihadrasarajsunde ^{r[20]}	<ul style="list-style-type: none"> • <i>Putrakjeevaka majja</i> along with lemon juice • <i>Patavan</i> tree juice along with <i>mishri</i>(sugar)
3	Rasa manjari ^[21]	<ul style="list-style-type: none"> • <i>Bandhyakarkoti</i> along with cow's <i>ghee</i>
4.	Anupan manjari	<ul style="list-style-type: none"> • Combination of <i>ghee, honey</i> and bark of <i>arjun</i>

(Antidote should be given after the ending of 5th *vega* and before the end of 7th *vega*.)

Medicinal properties of vatsanabha (Pandit Kashinath Shatri, 2014)

Vatsanabha having the following properties

- *Pranahara*-poisonous, if taken without purification it takes away life
- *Vyavayi*- spreads all over the body without digestion
- *Vikashi*- it loosens the joints
- *Aagneya*-hot in potency
- *Yogavahi*- acts as catalyst for other herbal ingredients to deliver the therapeutic action
- *Brimhana*- nourish the body
- *Veeryavardhan*- improves the quality and quantity of sperms
- *Kantharukghna*- useful in throat disorders
- *Sannipataghna*- useful in chronic disorders
- *Rasayana*- having properties of rejuvenating and anti aging
- *Deepana*- improving the digestion power
- *Balavardhan*- improved body strength
- *Agnimandhyahara*- relieving the indigestion
- *Pleehodara*- useful in splenomegaly
- *Vataraktahara*- useful in gout disease
- *Shwashara*- useful in respiratory disorders
- *Kaasahara*- useful in cough and cold
- *Gudamayahara*- useful in ano-rectal disorders
- *Grahnihar*- useful in irritable bowel syndrome
- *Gulmahara*- useful in abdominal tumor
- *kushtahara*- useful in skin diseases
- *Panduhara*-useful in anemia
- *Jwarhara*-useful in fever
- *Amavatahara*- helpful in rheumatoid arthritis
- *Vataghna*-useful in neurological disorders
- *Timirahara*- useful in eye disorders
- *Nishandhyahara*- useful in night blindness
- *Abhishyanda*- useful in conjunctivitis
- *Karnashoth*- useful in ear swelling
- *Netrashotha*- relieves eye swelling
- *Karnshoolhara*- useful in ear ache
- *Shirshoolahara*- useful in headache
- *Grudhrasi*- useful in sciatica
- *Kativedna*- useful in lower back ache
- *Akhu, vrushchika, sarpa vishahara*- useful in rodent bite, scorpion bite and snake bite

Contra-indications while consuming of vatsanabha

- During the consumption of *Vatsanabha* one should be avoid the food substance having properties of *pitta* aggravation like *ushna* (hot), *katu* (pungent), *Amal* (sour), *lavana* (salty), *sarshap tail*(mustard oil), *lashun*(garlic) etc.^[23]
- It is also contra-indicated in olds, early childhood, diseased, pregnancy, lactating woman, emaciated persons, having symptoms of tuberculosis.
- It is also avoided in persons with having symptoms of *pitta* aggravation like anger, hunger, excessive thirst,

exercise, sun exposure, during summer and rainy season and when there is chance of *pitta* aggravation (Pandit Kashinath Shatri, 2014).

- While consuming the *vatsanabha* preparation one should be taken the *go-dugdh*, *ghrit*, *takra*, *sneha*, sweet curd, sugar, sweet taste(*madhur rasa*) substance, *shaali dhaan*, cold water (*sheetal jala*), honey etc (Siddhi Nandan Mishra, 2008).

Vatsanabha as a Visharasayana

First perform the bio-purification and follow the proper diet of a person, who wants to take the *vatsanabha*. After bio-purification start taking of *vatsanabha* in one *Sarshap pramana* and then gradually increase the dose by *Raj-sarshap*, *Moonga pramana*, *Brihi pramana*, *Yava pramana*, *Maasha pramana* and finally dose equal to *Ratti pramana*. This *kalpa* along with sugar gives the result as like the *Rasayana* (Siddhi Nandan Mishra, 2008).

Toxicology review of vatsanabha as per modern toxicology

Active principle and its action

Active principles found in *aconitum ferox* are Aconitine, pseudoaconitine, aconine, picratonine, benzoylamine, neopelline, etc. Among them aconitine is the chief alkaloid which is most virulent and others are less active alkaloids. Aconitine and other related alkaloids acts on the voltage-sensitive sodium channels of the cell membranes of excitable tissues. Aconitine first stimulates and then paralyzes the peripheral sensory and secretory nerves, CNS and nerves of myocardium, skeletal and smooth muscles (Gautam Biswas, 2015 and Krishan, 2012).

Toxic manifestation of aconitum ferox

The ingestion of aconite root produces feeling of warmth in mouth and throat which soon become a tingling and pricking sensation followed by salivation, nausea and vomiting. It produce muscular weakness, slow and weak respiration, slow and irregular pulse. Its large dose acts directly on the heart and produce arrhythmias. In early stage pupils contract and dilate alternately and dilate in late stage. Visual disturbances produced blurred vision or colour patches in visual field. Death may occur from shock or syncope, but usually occurs from asphyxia due to paralysis of the respiration (Krishan, 2012). Krishan vij, Textbook of forensic medicine and toxicology, edition 5th, reprint in 2012, chapter 42, page 528.

Treatment of aconitum toxicity

First activated charcoal or milk should be advocated that delay absorption. Stomach is washed with warm water or tannic acid or mixture of iodine. For avoiding of vagal inhibition of heart, atropine may be given. Inotropic therapy is required if hypotension persists. Artificial respiration and oxygen inhalation should be given to combat respiratory embarrassment (Krishan, 2012 and Gautam Biswas, 2015).

Postmortem appearances

There is no specific finding present. Pallor of mucous membrane may be present. Organs are congested. Fragments of

root may be present in stomach and mucous membrane of stomach is inflamed. Congestion and engorgement of the brain and lungs may be found. In lungs hemorrhagic pulmonary oedema and in heart diffuse contraction-band necrosis in myocardium may be found (Krishan, 2012 and Gautam Biswas, 2015).

Medicolegal Aspect (Gautam Biswas, 2015)

It is regarded as an ideal homicidal poison because it is cheap, easily available and have small lethal dose and small fatal period. It is extremely unstable and destroyed by putrefaction. Hence can't be detected by chemical analysis. Its accidental poisoning occurs due to eating of roots by mistake or use of quack remedies or consumption of herbal decoction made from aconite roots. It is also used as an abortifacient, cattle and arrow poison.

Therapeutic Dose (Pandit Kashinath Shastri, 2014)

- 1/16 to 1/8 ratti

Fatal Dose (Gautam Biswas, 2015)

- Root-1- 2GM
- Aconitine-2-5mg

Fatal period (Gautam Biswas, 2015)

- 2-6 hours

Important Formulation (Pandit Kashinath Shastri, 2014)

Mahashankha vati, Sanjivani vati, Tamra parpati, Kaphaketu ras, Tribhuvankirti rasa, Saubhagya vati, Rambaana rasa, Anand bhairava rasa, Hinguleshavara rasa, Panchamrita rasa, mrityunjaya rasa, Shivtandav rasa, Jaya vati, Panchamrita rasa, Amrit rasayana, Vish rasayana, Vishprabha vartika

DISCUSSION & CONCLUSION

Vatsnabha have the both synonyms which is just opposite to each other, one is *Amrita* means it Acts as nector if used in suitable dose after purification and other one is *Visha* means poison if it used in improper manner. Its property *ruksha, laghu, vikasi* and *vyavayi* is similar to poison. Its toxicological symptoms are described in both *ayurveda* and modern science. Various methods of its purification and therapeutic uses is mentioned in different *ayurvedic* books, which can be used in treatment.

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