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'Queen of Poisons' Aconitum with special reference to Indian Aconite - *Vatsanabha*

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ABSTRACT

Aconitum, the "Queen of Poisons" commonly known as Monkshood or Wolf's bane, is a genus of perennial plants belonging to the family Ranunculaceae. In *Ayurveda* also few species of Aconitum are used for its therapeutic actions and the most potent of them is *Aconitum Ferox*, also known as Indian aconite or *Vatsanabha*, and it has the ability to function as both the ultimate poison and an elixir. In *Ayurveda*, *Vatsanabha* is considered as *Mahavisha* included among *Sthavara Visha* by *Acharya Charaka*, and in *Kanda Visha* by *Acharya Susrutha*. *Aconitum Ferox* is a highly toxic with the estimated fatal dose of 1g of root powder with a fatal period of 6 hours which contains a potent cardiotoxin and neurotoxin known as Aconitine. Ingesting even a small amount of the plant can result in severe symptoms and even death. As a result of the high toxicity of *Vatsanabha*, prior to any therapeutic use, the roots should under gone proper *Sodhana* process. *Rasayana* (rejuvenating), *Deepana* (improves digestion), *Balavardhana* (improves strength) *Agnimandyahara* (relieves indigestion) *Pleehodara* (useful in splenomegaly), *Vataraktahara* (useful against gout) *Shwasahara* (useful respiratory diseases), *Kasahara* (relieves cough), *Gudamayahara* (useful in ano-rectal disorders) etc. are just a few of the therapeutic indications of *Vatsanabha* that have been used successfully to treat a range of medical conditions. Recent Researches have shown that *Vatsanabha* contains several biologically active compounds that may have numerous potential therapeutic properties. The pharmacological potential of *Aconitum Ferox* still justifies vast research possibilities.

Key words: *Vatsanabha, Mahavisha, Aconitum, Aconitum Ferox, Visha, Indian Aconite, Ayurveda, Plant Poison*

INTRODUCTION

Aconitum, commonly known as monkshood or wolf's bane, is a genus of perennial plants belonging to the family Ranunculaceae. The genus Aconitum contains over 300 species and is distributed widely throughout the Northern Hemisphere, including Asia, Europe, and North America. Aconitum species are known for their attractive flowers, which range in colour from white to purple and blue. However, from centuries they are known for their efficacy as a potent medicine as well as for their poisonous alkaloids hence, it is known as the "queen of poisons".

The morphology of aconite is striking and distinctive, making it easily recognizable. They are herbaceous with large, deeply lobed leaves that are often palmate or divided into three to five leaflets. The stem of an aconite plant is erect, branched, and can grow up to 2 meters tall which is typically green or purplish in colour. The flowers are distinctive, with a hooded shape that resembles a monk's cowl. They are typically blue or purple, although some species may have white or yellow flowers. The flowers are generally arranged in long spikes or clusters. They produce dry, elongated fruits that split open to release their seeds. The roots of an aconite plant are fleshy, tuberous, and often spindle-shaped.[1] They are used in traditional medicine but can be toxic if ingested. The plants contain a variety of alkaloids, including aconitine, mesaconitine, and hypaconitine,[2] which can cause severe cardiotoxicity, neurotoxicity and cytotoxicity.[3,4,5]

Despite of its toxic nature, aconitum alkaloids are known to have potent analgesic and anti-inflammatory

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properties, as well as the ability to regulate the cardiovascular and nervous systems. On the cardiovascular system it has been shown to decrease heart rate, lower blood pressure, and improve blood flow to the heart. It has also been shown to have anti-arrhythmic effects and to be useful in the treatment of atrial fibrillation. On the nervous system it has been shown to have analgesic and anti-inflammatory effects,[6] and has been used to treat conditions such as arthritis and rheumatism.[7] Aconite has also been shown to have sedative and anxiolytic effects,[8] and has been used to treat anxiety and depression.

In *Ayurveda* also few species of Aconitum are used for its therapeutic actions as Aconitum ferox (*Vatsanabha*), Aconitum chasmanthum, Aconitum heterophylum (*Ativisha*), Aconitum palmatum (*Prativisha*) etc. The most potent of them is Aconitum ferox, also known as Indian aconite or *Vatsanabha*, and it has the ability to function as both the ultimate poison and an elixir.

The purpose of this review is to provide an overview of the history, medicinal uses, and safety concerns of Aconitum ferox (*Vatsanabha*). This review will also explore the current state of research on *Vatsanabha*, including clinical trials and laboratory studies. By examining the existing literature on *Vatsanabha*, this review aims to provide a comprehensive understanding of this important plant and its potential uses in various medical conditions.

VATSANABHA

Botanical description[9]

Vatsanabha botanically identified as *Aconitum Ferox* is native to the Himalayas and is found in regions such as Nepal, Bhutan, and Tibet. It is a perennial plant that can grow up to 2 meters in height. The leaves are large and palmate, with deeply cut lobes. They are dark green in colour and can reach up to 30 cm in diameter. The flowers of *Aconitum Ferox* are blue to violet in color and are arranged in a dense, elongated cluster at the top of the stem. Each flower has 5 petals, 2 of which are large and helmet-shaped, while the other 3 are smaller and narrow. The flowers bloom in the late summer and early autumn. The roots of *Aconitum Ferox* are thick and fleshy, with a cylindrical shape. They are dark brown to black in colour and can grow up to 1 meter in length which contain toxic alkaloids. Overall, the morphology of *Aconitum ferox* is typical of plants in the Ranunculaceae family, with large, deeply cut leaves and showy, helmet-shaped flowers.

General Description

Vatsanabha, its synonyms, and qualities were described by nearly all of *Nighantu*, but *Rasa Shastra's* growth boosted *Vatsanabha's* applicability. *Rasa Vagbhata* specifically indicated that three months of *Vatsanabha* administration heals all eight primary forms of *Kushtha*, six months of *Vatsanabha* administration improves complexion, and twelve months of *Vatsanabha* administration cures all ailments.[10]

From the time of the Vedic civilization, the plant *Vatsanabha* has been renowned for its medicinal benefits. Nearly all of the *Samhitas* in *Ayurveda* discuss it, and later, *Nighantus* have provided a full account, including its distinguishing characteristics. *Vatsanabha* has been utilized in *Ayurveda* for a very long time, but its significance enhanced once *Rasashasta* was flourished.

Derivation of the word *Vatsanabha* is from the resemblance of the tuber of Aconitum ferox with the umbilicus of Calf. In *Ayurveda* based on its morphology, properties and therapeutic actions it is popular with various synonyms as *Visha* (is a poison and it spreads very quickly all over the body (*Ksweda*) as the consumption makes the individual unconscious, (*Garalam*) as it kills the person if consumed.

Vatsanabha is remarked with numerous synonyms in *Ayurveda* Texts which are tabulated below.

Table 1: Synonyms in *Ayurveda* Texts

Synonyms	B.P[11]	DN[12]	RN[13]	SN[14]	PN[15]	RT[16]	RJN[17]	SHN[18]
Amrutha		+	+				+	
Darada				+				+

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Garala		+	+	+				+
Kalakuta				+				
Kakola								+
Kshweda						+		+
Mahaoushada		+	+					
Mahavisha					+			
Marana		+	+					
Naga		+	+					
Nepali							+	
Pranaharakam		+						
Shoukilya								+
Sindhuvara	+	+					+	
Saurasthraka								+
Sthoka		+						
Tailakanda					+			
Ugram		+	+					
Vatsanabha	+	+	+	+	+	+	+	
Visham	+	+				+	+	+
Vishamugram		+	+					

B.P. - Bhavaprakasha Nighantu, R. N. - Raja Nighantu, D. N. - Dhanwantari Nighantu, S.N. -Saraswati Nighantu, P. N. - Priya Nighantu, R.T. - Rasatarangini, RJN - Rasajalanidhi, Sh.N. - Shaligrma Nighantu.

Taxonomical Classification[19]

Kingdom : Plantae

Class : Magnoliopsida

Order : Ranunculales

Family : Ranunculaceae

Genus : Aconitum

Species : *Aconitum ferox* Wall.

In Ayurveda, *Vatsanabha* considered as *Mahavisha* is included among *Sthavara Visha* by *Acharya Charaka*, and in *Kanda Visha* by *Acharya Susrutha*.[20] *Vatsanabha* is also classified under different *Vargas* in various *Nighantus* as enlisted in Table 2.

Table 2: Classification of *Vatsanabha* in *Nighantus*[21,22]

1.	*Bhavaprakasha*	*Dhatvadi Varga*
2.	*Raja Nighantu*	*Pippalyadi Varga*
3.	*Sodala Nighantu*	*Candanadi Varga*
4.	*Dhanwanatari Nighantu*	*Mishrakadi Varga*
5.	*Shaligrama Nighantu*	*Visa Varga*
6.	*Saraswati Nighantu*	*Candanadi Varga*
7.	*Priya Nighantu*	*Shatapusphadi Varga*
8.	*Kaiyyadeva Nighantu*	*Mishraka Varga*

Pharmacological Properties[23]

Rasa: *Madhura*

Guna: *Ruksha, Tikshna, Laghu, Vikasi, Sukshma, Vyavayi*

Virya: *Ushna*

Vipaka: *Katu*

Dosha Karma: *Tridosha Shamaka* (especially *Kapha Vata Shamaka*)

Chemical composition[24]

Aconitum ferox root contains the alkaloids Aconitine, Pseudoaconitine, Chasmaconitine, Indaconitine, Hypoaconitine, Mesoaconitine, Lycoctonine, Delphinine and Bikhacontine.

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Toxic effects

Aconitum Ferox is a highly toxic with the estimated fatal dose of 1g of root powder with a fatal period of 6 hours which contains a potent cardiotoxin and neurotoxin known as Aconitine. Ingesting even a small amount of the plant can result in severe symptoms and even death. Symptoms of *Aconitum Ferox* poisoning can occur within minutes to hours after ingestion and may include, Numbness and tingling in the mouth and throat, Severe gastrointestinal symptoms, such as nausea, vomiting, and diarrhoea, Irregular heartbeat, heart palpitations, and chest pain, Muscle weakness, paralysis, and respiratory failure, Confusion, dizziness, and loss of consciousness.[25]

In *Ayurveda*, *Acharya Susrutha*[26] explains *Greevasthambha* and *Peeta Vid Mutra Netra* as the toxic effects of *Vatsanabha*. *Rasaratna Samucchaya* describes 8 stages of toxic effects of *Vatsanabha* based on the spreading of poison in different parts of the body. These stages are also dependent on the level of toxicity and dosage of *Vatsanabha*.[27]

Table 3: The stages of *Vatsanabha Visha*

1st stage	*Twak Vikara*
2nd stage	*Vepathu*
3rd stage	*Daha*
4th stage	*Vikrata*
5th stage	*Phenodgamanam*
6th stage	*Skandha Bhanga*
7th stage	*Jadyata*
8th stage	*Marana*

Purification

As a result of the high toxicity of *Vatsanabha*, prior to any therapeutic use, the roots should under gone proper *Sodhana* process. The *Sodhana* of *Vatsanabha* mentioned in different *Ayurveda* text books are given below in Table 4.[28,34]

Table 4: Enumeration of the different procedure of *Shodhana*

SN	Text	Purifying Media	Method	Process Time
1.	*Rasa Tarangini*[28]	*Gomutra* (Cow's urine)	Pieces of *Vatsanabha* in size of *Chanaka* immersed *Ghatayantra* (pot) with media, placed under bright sunlight for 3 days, every replacing with fresh *Gomutra*. 4th day, dried after removing the outer layer and stored.[35]	4 days
2.	*Rasa tarangini*[28]	*Godugdha* (cow's milk)	*Swedana* (Steam cooking) of *Pottali* (pack) withsmall pieces of *Vatsanabha* in size of *Chanaka* (size of chick pea) in *Dolayantra* (vessel), later collectedafter it cools on its own, dried and stored.	1 or 2 *Yama* (3 or 6 hours)
3.	*Rasa Tarangini*[28]	*Aja Dugdha* (goats milk)	*Swedana* of *Pottali* with small pieces of *Vatsanabha* in size of *Chanaka* in *Dolayantra,* collected after it cools on its own, dried, stored.	3 hours
4.	*Rasendrasara Sangraha*[29]	*Gomutra*	Pieces of *Vatsanabha* in size of *Chanaka* are given *Bhavana* (trituration) in *Khalwayantra* (mortar and pestle)	3 days consistent
5.	*Rasendrasara Sangraha*[30]	*Triphala Qwatha* aloneor with *Ajadugdha*	*Swedana* of *Pottali* with small pieces of *Vatsanabha* in size of *Chanaka* in *Dolayantra,* collected after it cools on its own, dried and stored.	

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6.	*Rasendrasara Sangraha*	*Gomutra*	*Swedana* of *Pottali* with 10 *Tola* of small pieces of *Vatsanabha* in *Dolayantra,* collected after it cools onits own, dried, stored.	24 hours
7.	*Ayurveda Prakasa*[3]	*Godugd ha*	*Swedana* of *Pottali* with small pieces of *Vatsanabha* in *Dolayantra,* collected after it cools on its own, dried, stored.	5 hours
8.	*Ayurveda Prakasa*[3]	*Mahisha Shakruth* (buffaloe sdung)	*Vatsanabha* pieces placed in the *Patra* tarnished with *Mahisha Shakruth* (Buffalo dung) and packed as a ball, burnt with high temperature using *Karisha.* After cooling by its own the pack is broken open to collect the purified *Vatsanabha*	1 *Prahar a* (3 hours)
9.	*Yogartnakar a*[33]	*Godugd a*	*Swedana* of *Pottali* with small pieces with *Vatsanabha* in *Dolayantra,* later collected after itcools on its own, dried, stored	1 *Prahar a* (3 hours)
10.	*Yogartnakar a*[34]	*Godugd ha* and *Jala*	*Swedana* of *Pottali with* small pieces with *Vatsanabha* in *Dolayantra,* collected after it cools onits own, dried, stored	1 *Prahar a* (3 hours)

Pratyoushadha

Several medications have been listed in the literatures which have the potential to counteract the harmful effect *Vatsanabha* poisoning symptoms and signs in affected individuals. As per modern medicine the use of emetics or stomach wash with the solution containing charcoal or tannic acid or milk is advised.

Table 5: *Pratyoushadha* according to different texts

SN	Text	*Pratyoushadha*
1.	*Rasendra Chintamani*[35]	*Haridra* (*Curcuma longa Linn.*) and *Meghanada* (*Amaraanthus tricolor*) *Swarasa* (juice extract). *Sarapakshi* (*Ophiorrhiiiza mungos*) or *Tankana* (borax), *Putranjivaka Majja* (Pulp of fruits of *Putranjiva roxburghii. Wall.*) along with *Nimbu* (*Citrus medica Var. acida*) *Swarasa.*
2.	*Rasendra Sambhava*[36]	*Patavanavrukshayasa Rasa* (*Erythrina variegate L.*)1 *pala* and *sharkara* (sugar)
3.	*Rasa Jalanidhi*[37]	*Jati* (*Jasminum officinale L.*), *Neeli* (*Indigofera tinctoria Linn.*), *Saindhava (*Rock salt*), kakamachi* (*Solanum nigrum Linn.*), *Aparajita* (*Clitoria ternatea Linn.*), *Triphala*, *Kustha* (*Saussurea lappa CB Clarke*), *Madhuka* (*Yastimadhu- Glyzcerhia glabra Linn.*), *Jiraka* (*Cuminum cyminum Linn.*), *Kshiravruksha* Powdered Bark of *Arjuna* (*Terminalia arjuna W. & A.*) mixed *madhu* (honey) and *dadhi* (curds). *Tankana* mixed with honey and juice of *meghanada* (*Amaraanthus tricolor*).
4.	*Rasa Jalanidhi*	*Goghrita* along with *bhargi, Dadhi, Snuhi kshara (*Alkali of *Euphorbia nerifolia Linn.), Sariva (Hemidesmus indicus R.Br), Tanduliya, Dhooma, Manjista (Rubia cordifolia Linn),* and *Yastimadhu (Glyzcerhia glabraLinn.*)
5.	*Prayoga Samuchyya*[38]	*Triphala Kwatha, Neelimula* (roots of *Indigofera Tintorica Linn.*)*Maricha Kwatha* (*Piper nigrum Linn.*) *Triphala kwatha, Ghritha* and *Kshira*
6.	*Visha Vaidya Jyotsnika*[39]	*Nirvisha* (Delphinium Denudatum Wall.) *Neelimoola* (Indigofera Tintorica Linn.).
7.	*Kriyakoumdi*[40]	*Maricha* (*Piper nigrum Linn.*) *Kashaya*, *Tandulodaka*, *Triphala Kashaya*. *Chitraka swarasa* (*Plumbago zyelinica*

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		Linn.) *Nirvisha* (Delphinium *Denudatum Wall*.) *Gomutra* (cow's urine) with *Navaneetha* (butter)

Therapeutic Uses

Therapeutic actions of *Vatsanabha* are elaborated in different *Ayurveda* texts and *Nighatus* with the therapeutic dose 1/16 to 1/8 *Ratti*, which is approximately 8-16mg[41]. In Ayurveda the therapeutic uses of *Vatsanabha* is described as *Pranahara* (which takes away life), *Vyavayi* (spreads to all parts of the body) *Vikashi* (Loosens joints), *Agneya* (hot in potency), *Yogavahi* (acts as a catalyst) *Brumhana* (nourishing) *Veeryavardhana* (improves sperm quality and quantity) *Kantharuk* (useful in throat disorders), *Sannipataghna* (useful in fatal disorders), *Rasayana* (rejuvenating), *Deepana* (improves digestion), *Balavardhana* (improves strength) *Agnimandyahara* (relieves indigestion) *Pleehodara* (useful in splenomegaly), *Vataraktahara* (useful against gout) *Shwasahara* (useful respiratory diseases), *Kasahara* (relieves cough), *Gudamayahara* (useful in ano-rectal disorders), *Grahanihara* (useful against IBS), *Gulmahara* (useful in abdominal tumors) *Kushtahara* (useful in skin diseases) *Panduhara* (useful in anemia) *Jwarahara* (useful in fever) *Amavatahara* (useful in rheumatoid arthritis) *Vataghna* (Balances *Vata*), *Timirahara* (useful in eye disorder) *Nishandhyahara* (useful in night blindness) *Abhishyanda* (useful in conjunctivitis) *Netrashotha* (relieves eye swelling) *Karnashotha* (relieves ear swelling) *Karnashoolahara* (useful in ear ache) *Shirashoolahara* (useful in headache) *Grudhrasi* (useful in sciatica) *Kativedana* (relieves lower back pain), *Akhu, Vrushchika, Sapra vishahara* (Useful in rodent bite, scorpion bite and snake bite).[42,43,44]

Recent researches in *Aconitum ferox*

There have been several recent research studies on *Aconitum ferox*, which have focused on its chemical composition, traditional uses, and potential therapeutic applications.

Chemical Composition[45]

A study published in 2021 analyzed the chemical composition of *Aconitum ferox* using high-performance liquid chromatography (HPLC) and found that it contained several biologically active compounds, including alkaloids, Aconitine, Pseudoaconitine, Chasmaconitine, Indaconitine, Hypoaconitine, Mesoaconitine etc. The researchers suggested that these compounds could have potential applications in drug development.

Anti-inflammatory Activity[46]

Another study published in 2021 investigated the anti-inflammatory activity of *Aconitum Ferox* extract in vitro and in vivo. The researchers found that the extract was able to reduce inflammation in animal models and suggested that it could be used to develop new anti-inflammatory drugs.

Traditional Use[47]

A review published in 2020 examined the traditional uses of *Aconitum Ferox* in *Ayurvedic* and *Tibetan* medicine. The authors found that the plant has a long history of use for treating pain, inflammation, and neurological disorders. They suggested that further research could help to validate these traditional uses and identify new therapeutic applications.

Toxicity[48]

A study published in 2019 investigated the toxicity of *Aconitum Ferox* extract in rats. The researchers found that high doses of the extract could cause liver and kidney damage, highlighting the need for caution when using this plant for medicinal purposes.

DISCUSSION

Vatsanabha, a versatile medicinal plant in *Ayurvedic* literature, has been skilfully employed to address various minor and challenging health conditions. However, if not utilized in accordance with the principles governing its formulation and dosage, it can result in severe adverse reactions. Both modern and ancient texts describe symptoms that closely align, ultimately pointing towards the risk of death due to cardiac arrest. Therefore, a thorough understanding of *Shodhana* methods and *Prathyaoushada* is essential for managing potential issues. *Rasayana* (rejuvenating), *Deepana* (improves digestion),

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Balavardhana (improves strength) *Agnimandyahara* (relieves indigestion) *Pleehodara* (useful in splenomegaly), *Vataraktahara* (useful against gout) *Shwasahara* (useful respiratory diseases), *Kasahara* (relieves cough), *Gudamayahara* (useful in ano-rectal disorders) etc. are just a few of the therapeutic indications of *Vatsanabha* that have been used successfully to treat a range of medical conditions. Recent Researches have shown that *Vatsanabha* contains several biologically active compounds that may have numerous potential therapeutic properties.

CONCLUSION

In conclusion, *Vatsanabha* emerges as a versatile and valuable Medicinal Plant in *Ayurveda*, with a rich history of application across a spectrum of ailments. Its judicious use, adhering strictly to the principles outlined in *Ayurvedic* literature regarding formulation, preparation, and posology, reveals its therapeutic potential. However, it is crucial to underscore the importance of responsible and informed usage, as deviating from these guidelines may result in severe adverse reactions. In the pursuit of integrating traditional knowledge with contemporary practices, further research and collaboration are warranted to bridge the gaps in our understanding. This not only enhances the credibility of *Ayurveda* but also ensures the safety and efficacy of *Vatsanabha* as a therapeutic agent. Ultimately, a balanced and informed approach to the utilization of *Vatsanabha* will contribute to its continued relevance and significance in the realm of *Ayurvedic* medicine. Overall, these studies suggest that *Aconitum Ferox* has significant potential for therapeutic applications, but also highlight the need for further research to fully understand its chemical composition, safety, and efficacy.

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