Aconitum ferox Wall. ex Ser.

**Scientific Name:** *Aconitum ferox* Wall. ex Ser.

**Synonym:** *Aconitum virorum* D. Don, *Delphinium ferox* Baill.

**Family:** Ranunculaceae

**Genus:** Aconitum

**Species:** ferox

**Common Name:** Indian aconite; Monkshood; Bishnaq; Henbane

**Parts used:** Dried tuberous root

**Plant Description:** It is a deciduous perennial herb that grows up to 1.0 meter height with 0.5 meter wide and which favors many types of soil. It is a beautiful plant with the tall and erect stem crowned in racemes of large eye-catching blue, purple, white, yellow or pink zygomorphic flowers with numerous stamens. They are distinguished by having one of the five petaloid sepals (the posterior one), called the galea in the form of a cylindrical helmet; hence the English name monkshood. There are 2-10 petals, in the form of nectarines. The two upper petals are large. They are placed under the hood of the calyx and are supported on long stalks.

**Chemical composition:** The tuber known as Bish, contains an crystalline alkaloid which is close analogy with aconitine, has been called as napellin or pseudo-aconitine with a transparent vitreous appearance, soluble in boiling water, less soluble in ether, chloroform and alcohol; and a small quantity of aconitine, picro-aconine, benzyl-aconine and homo-napelline.

**Structures of isolated chemical constituents of Aconitum ferox Wall. ex Ser.**

![Pseudoaconitine](image1)

![Bikhaaconitine](image2)
**Actions of Herb:** Diaphoretic, diuretic, antiperiodic, anodyne, antidiabetic, antiphlogistic antipyretic.

**Medicinal Uses:** Its control over spermatorrhoea and incontinence urine is equally great. It is also useful in cases of paralysis and leprosy. The root is used in the form of paste (lep), spread upon the skin in cases of neuralgia and muscular rheumatism, acute and chronic, itching as in erythema; in nasal catarrh, tonsillitis, sore throat, coryza, acute gout and other painful affection. For internal administration the tincture of *A. ferox* must be used with great caution. Internally the tincture of root is used in treatment of fever and rheumatism, usually in combination with other drugs; it is also used as a remedy for cough, for asthma and for snake-bite. These are employed in the treatment of a variety of fevers and inflammations of the membranes of the throat, nose, stomach and intestines.

**Side Effects & Toxicity:** Aconite may cause hypotension (low blood pressure), irregular pulse, various arrhythmias (altered heart beats), or first-degree heart block. Aconite poisoning can cause prolonged re-polarization of the myocardium, which leads to triggered automaticity and ventricular tachyarrhythmias including ventricular ectopy, ventricular tachycardia (fast heart beat), and ventricular fibrillation. Aconite has also been reported to cause nausea, vomiting, epigastric pain, diarrhea, muscle cramps, retrosternal discomfort, dizziness, vertigo, variations in motor/sensory skills of limbs, ataxia (loss of coordination), paresthesia (altered sensation), "stiffness" in face, trunk and limbs, clonic convulsions, coma, leukocytosis (high white blood cell count), dimness of vision, blackouts, blurred or double vision, agitation, hyperventilation, difficulty breathing, and respiratory depression. Aconite may cause liver or kidney damage, hyper-salivation, throat constriction, hypokalemia (low potassium in the blood), and hypothermia (low body temperature). Tingling and numbness have occurred when aconite is applied to the skin (topically). Aconite may lower blood sugar levels. Caution is advised in patients with diabetes or hypoglycemia, and in those taking drugs, herbs, or supplements that affect blood sugar. Serum glucose levels may need to be monitored by a healthcare provider, and medication adjustments may be necessary.

**Contraindications:** It is contraindicated in pregnancy, lactation, and in early childhood, patients of cardiac, liver, kidney and brain diseases. Aconite is contraindicated in patients with coronary disease, cardiac dysfunction, and arrhythmias or homodynamic instability. Avoid aconite use in
patients with gastrointestinal disorders, stomach ulcers, duodenal ulcers, reflux esophagitis, ulcerative colitis, spastic colitis, and diverticulosis.

Dosing

Adults (18 years and older)
There is no proven safe or effective dose for aconite. Topical (application on the skin) use is not recommended. Aconite is sometimes used in liniments (rubifacients) with Belladonna. Historically, a 1.3% aconitine topical liniment has been used. Taking 1-5 drops of a tincture of the fresh leaf by mouth four times a day to relieve pain has been used. Also, homeopathic preparations of 6c to 30c have been used. A 6c potency strength is made by diluting one part of aconite tincture to 99 parts of alcohol or water then the solution is taken and diluted again with 99 parts of alcohol or water. This process is repeated 6 additional times, resulting in a 6c potency.

Children (younger than 18 years)
There is no proven safe or effective dose for aconite, and use in children is not recommended. Homeopathic aconite has been studied in infants to help relieve postoperative agitation, but further information is needed to confirm these results.

Interactions with Drugs
Anti-arrhythmic medications may antagonize the effects of aconite and increase the risk of cardiotoxicity or other side effects. Patients taking anti-arrhythmics or other heart medication should consult with a qualified healthcare professional, including a pharmacist. Aconitine may lower blood sugar levels. Caution is advised when using medications that may also lower blood sugar. Patients taking drugs for diabetes by mouth or insulin should be monitored closely by a qualified healthcare provider. Medication adjustments may be necessary. Aconitine may lower blood pressure. Caution is advised when using medications that may also lower blood pressure. Also, combined use of aconitine (an alkaloid found in aconite) with anesthetic medications or diuretic medications (those that increase urine flow) may also lower blood pressure. Caution is advised. Theoretically, digoxin may interfere with aconitine effects on the heart. Combined use of these medications could be extremely dangerous and result in additive effects of both agents. Consult with a qualified healthcare professional, including a pharmacist.

Interactions with Herbs and Dietary Supplements
Aconitine may lower blood pressure. Caution is advised when using herbs or supplements that may also lower blood pressure. Also, combined use of aconitine (an alkaloid found in aconite) with herbs and supplements that have anesthetic effects or diuretic effects (those that increase urine flow) may also lower blood pressure. Caution is advised. Aconitine may lower blood sugar levels. Caution is advised when using herbs or supplements that may also lower blood sugar. Theoretically, digoxin-like herbs or supplements (foxglove, Siberian ginseng) may interfere with aconite effects on the heart producing an unknown and potentially dangerous effect. Consult with a qualified healthcare professional, including a pharmacist before combining therapies.
Phytochemical Screening of *A. ferox* Wall. ex Ser.
The ethanolic and aqueous extracts of *A. ferox* were screened for possible active principles using standard phytochemical methods.

<table>
<thead>
<tr>
<th>Active principles</th>
<th>Aqueous extract</th>
<th>Ethanolic extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkaloids</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Cyanogenic glycosides</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Saponins</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Tannins</td>
<td>+</td>
<td>+++</td>
</tr>
<tr>
<td>Steroids</td>
<td>++</td>
<td>++</td>
</tr>
</tbody>
</table>

+, ++, and +++ describe the strength and frequency of colour change

**Effect of *A. ferox* on the cardiovascular system**
*A. ferox* produced dose - dependent depressor effects on the force of contraction of the isolated frog heart. Effects of *A. ferox*, acetylcholine, histamine, and adrenaline on the force of contraction of the isolated frog heart are shown in Figure below.

![Figure: Effects of Acetylcholine, Histamine and *A. ferox* (AF) on the isolated frog heart.](image)


**Moisture Content**
Moisture content of raw material increased when purified. The excess of water content absorbed to the tuberous root is from purifying medium, as roots are the highly water absorbing part of a plant.

**Volatile oil Content**
Volatile oil was not present in the samples.

**Extractives**
Comparing the values obtained water soluble extractives decreased while alcohol soluble extracts increased during the purification process. Water soluble extractive mainly represents the percentage of organic constituents such as tannins, sugar, plant acids, mucilage and glycosides.
**Ash Value**
The ash mainly represents the inorganic salt present in the drug. Ash value regarded as general criteria to ascertain purity of any drug. Acid insoluble ash, mainly gives the percentages of sand and impurities that remain insoluble in dilute HCl and it was found to be 0.86, 0.57, and 0.56 respectively. Lower the value of acid insoluble ash, the higher the purity. Water insoluble ash mainly gives the percentage of organic matter present in ash and it is found to be 1.46, 1.28, and 1.369 respectively.

**Fiber Content**
Fiber content remains more or less same after purification.

**Sugar Content**
Total sugar is the sum total of reducing and non-reducing sugar in a plant part. The total sugar was found to be 3.51. Reducing sugar content was 2.99 and non-reducing sugar 0.52.

**Qualitative Chemical Analysis**
The study revealed the presence of steroids and alkaloid whereas; no phenols and flavonoids were found in *Aconitum ferox* sample.

**Thin-layer Chromatography**
Thin-layer chromatography was carried out with Toulene-Butanol (1:1), Hexane-Butanol (4:1), Toulene-Acetic acid (7:3) and Chloroform-Methanol (9.5:0.5). In Toulene-Butanol solvent system green spot was observed in UV light and Rf value was 0.2100. In the same solvent system brown spot was visualized when placed in iodine chamber with Rf value 0.8403. In Hexane-Butanol solvent system green spot was observed under UV light with Rf value 0.7692. Brown colored spot having Rf value 0.0982 was visualized on placing in iodine chamber. In Toulene-Acetic acid solvent system blue spot with Rf value 0.8691 was seen whilst brown spot observed on placing in iodine chamber revealed 0.3268 Rf value. In Chloroform-Methanol solvent system two brown spots were visualized on placement in Iodine Chamber having 0.7589 and 0.6250 Rf values respectively.

**Atomic Absorption Spectroscopy**
Atomic absorption spectroscopy was studied for zinc, copper and nickel. Concentration of zinc was found to be 0.4398 ppm; copper concentration was found to be 0.4931 ppm and nickel concentration was found 0.5471ppm in *A. ferox* extract.

**References**


Rai P, Pathak A, Rajput SJ. Stability-indicating reversed-phase liquid chromatographic methods for the determination of aconitine and piperine in a polyherbal formulation. The Maharaja Sayajirao University of Baroda. Pharmacy Department, Quality Assurance Laboratory, Centre of Relevance and Excellence in Novel Drug Delivery Systems, G.H. Patel Building, Donor's Plaza, Fatehgunj, Vadodara, Gujarat, India.


