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A COMPLETE REVIEW ON *ATIVISHA –ACONITUM HETEROPHYLLUM*

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ABSTRACT

Ativisha (Aconitum heterophyllum wall) of family *Ranunculaceae* is an Ayurvedic herb which is known for its significant medical properties. The roots of the plant find use in one form or the other in an assortment of ayurvedic preparations. Lots of phytochemical constituents (metabolites) are extracted from this plant, especially diterpene alkaloids which are the chief compounds having pharmacological activities such as analgesic and anti-inflammatory, therefore, an attempt has been made to review the different studied carried out in its chemistry as well as pharmacology.

KEYWORDS: *Aconitum heterophyllum, Ativisha, Ayurveda.*

INTRODUCTION

Aconitum which is also recognized as aconite is a genus consisted of 250 species of angiosperm plants. These perennial herbs occur in mountainous parts of the Northern Hemisphere according to Chisholm[1]. They grow in the moisture-retentive but well-drained soils of mountain meadows. Most species show lethal nature and should be handled with care. Amongst various species of genus Aconitum, Aconitum heterophyllum also known as “Atees”, is widely distributed in the alpine and sub-alpine region of Himalayas, showing essential medicinal assets because they hold prime position.

Morphological characters:

The species A. heterophyllum belongs to the genus Aconitum (kingdom: Plantae, phylum: Magnoliophyta, class: Magnoliopsida and family: Ranaunculaceae). Roots are biennial, paired and have tubers. They are whitish or grey in colour. Stems are known to be erect, simple and branched. They are 15–20 cm high, glabrous below and finely crispopubescent in the upper part. Leaves are known to be heteromorphous and glabrous possessing long petioles, and blades are orbicularcordate or ovate-cordate in outline with a usually narrow sinus (1–1.5 cm deep). The leaves are usually 5-lobed.

Medicinal uses:

Internal uses:

The underground stem and root as such are used in traditional system of medicine. The root powder of *Ativisha* with honey is prescribed for cough irritations and bronchitis, it is an antihelmintic and in action it is potent against guinea-worms. It is effective in blood-pressure. The aqueous pulp of A. Phyllum as well as its main constituent namely atisine produces marked hypotensive effect. It is prescribed in malerial fevers but cannot replace quinine. It is one of the bitter constituents which are prescribed in Ayurveda[2] which give relief in non-insulin dependent diabetes

Plants are rich sources to search new active compounds that become a trial to modern pharmaceutical industry and many synthetic modern medicines are made from plant reported by Benamar *et al*.[3].

Plants have secondary metabolites that suppress the growth and development of adjacent biological systems named as allelochemicals[4]. Phenolic and flavanoid compounds are extracted from this plant which has antioxidant and antibacterial effects[5, 6].

A. heterophyllum is a good aphrodisiac and effective as a diuretic. It is a good bitter remedy against gastroenteric fevers amongst infants and children. Homeopathy designates this natural herb as a principle drug for neuralgia. It is also useful in rheumatism, nervous pains as an analgesic and nerve sedative. It is claimed that the roots of the plant control hysteria and possess heart and nerve sedative property.

A. heterophyllum is found as the main active ingredient of the herbal preparation Diarex vet with other essential medicinal plants and has been efficiently used in the cases of indigestion, flatulence and diarrhoea of varying aetiologies like bacterial, fungal and Protozoal[7].

The Indian central indigenous drug committee in 1901 declared *A. heterophyllum* quit ineffective an antiperiodic. Chopra[8] and others also have drawn the same conclusion.

External uses:

The crushed leaves of *Aconiyum*, mixed with rock salt are applied focally. The seeds crumpled in honey are applied locally on throat and in tonsillitis. Inhalation of roots by nose is beneficial in headache, especially migraine.

Phytochemical constituents

A. heterophyllum possesses some phytochemical constituents which have medicinal values. The composites of *A. heterophyllum* such as alkaloids, amide alkaloids, flavonoids, flavonol glycosides, diterpenoid and norditerpenoid compounds were isolated and characterized with the help of chromatographic separation techniques and their structures were explained by the using nuclear magnetic resonance techniques. These compositions were the chief target of the

medicinal chemists as they hold both medicinal and toxic nature. A complete study of the basic components of the roots of *A. heterophyllum* has directed to the isolation of seven new diterpene alkaloids. The weak base fraction yielded heteratisine and three more alkaloids labelled as heterophyllisine, heterophylline and heterophyllidine. These compounds are lactone alkaloids which have structure relation to heteratisine. The strong base fraction produced two new alkaloids (atidine and F-dihydroatisine). The very strong base fraction yielded alkaloids designated as hetidine and hetisinone. The latter had been encountered earlier as a chemical transformation product of hetisine[9].

Pharmacology:

Atisine is much less toxic than aconitine and pseudaconitine and consequently the species is often regarded as non-poisonous. Although the alkaloid *atisine* produce hypotension the whole aqueous extract of the root induced marked hypertension apparently through an action on the sympathetic nervous system. It is now confirmed that the alkaloid *atisine* is the important constituent of *A. heterophyllum* which acts as antiperodic aphrodisiac and tonic aconitine has action as the CNS CVS and respiratory system due to the presence of benzyl ester and OH groups in the molecular structure[10] this system is present is present in the polyesters of *Celastrus paniculatus*[11] and these esters have got similar action as aconitine.

Verma *et al*. demonstrated that the anti-inflammatory activity of ethanolic root extract of *A. heterophyllum* (225, 450 and 900 mg/kg *p.o.*) was calculated in cotton pellet-induced granuloma in rats[7]. The extract has reduced inflammation as evidenced by reduced weight of cotton pellet in cotton pellet-induced granuloma in rats. The results revealed that the anti-inflammatory properties of extract and the effects were analogous to diclofenac sodium, a standard non-steroidal anti-inflammatory drug. In recent years, there is growing awareness that apart from being safer, economical and simply available herbs, phytochemicals and herbal products can affect the course of inflammatory diseases and may provide an amalgamation of nutritional substances, which help in re-establishing and maintaining wear and tear of tissues. Therefore, it would be rational to logically evaluate the traditional medicines used for their potential use in inflammatory diseases. *A. hetrophyllum* plant has been reported to hold antifungal cytotoxic, antiviral and immune-stimulant properties[12-15]. Other compounds extracted from *A. heterophyllum* include flavonoids, tannins, saponins and sugars[7].

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