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Ethnopharmacology and pharmacology of ayurvedic plant Ativisha

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ABSTRACT

Living a healthy life and increasing immunity is a trend in the year 2020. A low immunity gives rise to several types of diseases including gastroenteritis. This short review discusses the pharmacological and ethnopharmacological scope of Ayurvedic plant *Ativisha* (*Aconitum heterophyllum*) from the family Ranunculaceae with special focus to *Jwaratisara* (diarrhea with fever) in children.

Keywords: Ativisha, *Aconitum heterophyllum*, Diarrhea.

INTRODUCTION

People are more aware about personal hygiene and immunity in the year 2020. This is because a new novel Corona virus disease which has flu or influenza like symptoms became endemic and ultimately changes itself to pandemic status throughout the world at the beginning of the year of 2020. The epicenter of the disease is believed to be in Wuhan province of China [1].

Increasing body immunity not only protect us from respiratory diseases but also fights gastric problems such as gastroenteritis and so many recurrent infections like fever. India made remarkable development in reducing deaths among Indians younger than 5 years, with total deaths decreased from 2.5 million to 1.5 million from 2001 to 2012. But still the third most common cause of death in under-five children, responsible for 13% deaths and killing an estimated 300,000 children in this age group in India each year is diarrhea.[2] Diarrhea is caused by pathogens such as bacteria, protozoans and viruses like Vibrio cholerae, Shigella spp., rotavirus, norovirus etc.

Ayurveda is the 5000 years old *'Jivan Darshan'* (Philosophy of life) which deals not only disease but also helps us how to maintain a healthy and long life. In spite of several well-known and popular immunoboosting plants like *Aswagandha* (*Withania somnifera*), *Guduchi* (*Tinosphora cordifolia*), *Amlaki* (*Emblica officinalis*), *Haridra* (*Curcuma longa*) etc. there are several other known plants like *Ativisha* in Ayurveda which have potent antipyretic, anti-diarrhael activity specially for children. *Ativisha* is a Sanskrit term derived from '*Atikranta visam'*, that means though the plant belongs to the poisonous plant family, Ranunculaceae, but exceptionally it doesnot have poisonous effect at all. Apart from this, the constitute of *Ativisha* is very much suitable to the constitute of children, hence it is also called as *'Sishu Bhesaj'* (perfect drug for children.

Ayurvedic plant *Ativisha* comes under the genus Aconitum that consists of two fifty species of plants. In the northern hemisphere Aconitum occurs in mountainous parts of the Northern Hemisphere[3]. They mainly grows in the well-drain, moisture-retentive soils of mountain meadows. Most of the plants in this group exhibit poisonous activity and should be used with caution. Amongst the genus Aconitum, *Aconitum heterophyllum* popularly known as *'Atees'* in local language, is widely distributed in the alpine region of Himalayas.

ETHNOPHARMACOLOGY

It is one of the best remedy for gastro enteric fevers and diarrhea which may be correlated with *Jwaratisara* in Ayurveda. related to infants and children. Diarrhea in children often accompanies fever along with inflammation. Ativisha is a plant of choice for its treatment with all the secondary symptoms. There are several paediatric medicines as mentioned in ayurvedic classical books that contain Ativisha. For instance, in Ayurvedic compilation book named, 'Ayurved Sangraha' it is mentioned under

*'Baalrogadhikar' (*chapter of pediatric dieseses*)*, in several formulations like *Pippaladang ghritam*, *Puskaradichurnam*, *Baalkutajavlehya* etc. *Baalchaturbhadra churna* which is a very popular antidiarrheal anti pyretic medicine also contain *Ativisha* as one of its main ingredient. It is an anthelmintic in property and it is potent against guinea-worms. The powder of the root of *Ativihsa* when administered with honey is very good remedy for cough and bronchitis. It is used for the management of diseases of nervous system, digestive system, fever and rheumatism traditionally. The seeds are used as a diuretic. The leaves of *Ativisha*, mixed with rock salt are applied locally. The seeds along with honey are applied topically for soothing effect in tonsillitis. Simply inhalation of roots is highly beneficial in the management of headache. It is also effective in blood-pressure as its main constituent Atisine produces marked hypotensive effect. It is prescribed in malerial fevers as an adjuvant. It is one of the Tikta (bitter) and katu (pungent) rasa containing plant constituents which are prescribed in Ayurveda to give relief in non-insulin dependent diabetes. One of the prominent actions of *Ativisha* is its antidiarrheal activity when taken with fine powder of *Jaiphal (Myrstica fragrans), Sunth (Zingiber officinales)*, and *Bael (Aegle marmelos)*. The fresh juice of the root along with milk acts as an expectorant. The plant is also used to treat reproductive disorders and is also known to have hepatoprotective, antioxidant and carminative properties.[4,5]

PHARMACOLOGY

Hypolipidemic activity[6]: In a study, Methanol Fraction of *Ativisha*, exhibited hypolipidemic activity. The methanolic extract of *Ativisha* was administered orally in diet-induced obese rats. After four weeks treatment, blood samples were collected for the estimation of serum lipids and lecithin-cholesterol acyltransferase (LCAT). Liver was collected for the assay of HMG-CoA reductase (HMGR). In the study it was found that *Ativisha* markedly lowered total cholesterol, triglycerides and apolipoprotein B concentrations in blood serum. It also showed positive effects on serum high-density lipoprotein cholesterol and apolipoprotein A1 concentrations.

Antioxidant and Nephro-protective Activitiy[7]: In another study it is reported that root extract of *Ativisha* had antioxidant and Nephroprotective activity in Glycerol Induced Acute Renal Failure in Rats. In the study it was revealed that in- vitro antioxidant activity was found to be equal to Vitamin C and in an in vivo study root extract treated animals showed significant attenuation of biochemical parameters and histopathological changes of the kidney as compared to glycerol treated group.

Antidiarrhael activity[8]: In another study, *Ativisha* is reported with antisecretory and antimotility effect of which mediates through nitric oxide path way and thus proves its use in Ayurveda as anti-diarrheal drug. The results showed reduction in normal fecal output after 5th and 7th h of treatment in the study. It also showed significant activity in other parameters like small intestinal transit, fluid accumulation, and PGE_2-induced enteropooling models, which restored the altered biochemical parameters as well as prevented Na(+) and K(+) loss.

Antibacterial activity[9]: In a research finding, phytochemicals of *Ativisha* namely, two new aconitine-type norditerpenoid alkaloids 6-dehydroacetylsepaconitine (1) and 13-hydroxylappaconitine (2), along with three known norditerpenoid alkaloids lycoctonine, delphatine and lappaconitine were isolated from the roots of the *Ativisha*. Studies revealed that those phytochemicals exhibited significant antibacterial activity.

Immunobiological activity[10]: Certain Ayurvedic plants were investigated for treatment of chronic infections and immunological disorders. *Ativisha* among them along with *Kurchi (Holarrhena sp.)* appeared to stimulate phagocytic function while inhibiting the humoral component of the immune system.

Anti-inflammatory activity[11]: A study demonstrated the anti-inflammatory activity of ethanolic root extract of *Ativisha* was calculated in cotton pellet-induced granuloma in rats. The extract reduced inflammation as evidenced by reduced weight of cotton pellet. The results were analogous to diclofenac sodium, a non-steroidal anti-inflammatory drug (NSAID).

CONCLUSION

The *Ativisha* is a medicinal plant of India, which is commonly used in so many pediatric diseases specially *Jwaratisara* (diarrhea with fever) and *Kshin- Vyadikhammata* (poor immunity). Several research and validation took place for evaluation of this highly therapeutic plant. Further research is needed for evaluating other potent aspects of *Ativisha*.

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