Ethnopharmacology and pharmacology of ayurvedic plant Ativisha

S. Mukhopadhyay1, S. Palbag2
1 Director, ISM Drugs Control, Kolkata, West Bengal- 700006, India
2 Drug Inspector, ISM Drugs Control, Kolkata, West Bengal- 700006, India

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-diarrheal activity specially for children. Ativisha is a Sanskrit term derived from ‘Atikranta visam’, that means though the plant belongs to the poisonous plant family, Ranunculacaeae, 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 Hemisphere3. 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
"Baixogadriker" (chapter of pediatric dieceses), in several formulations like Pippaladang ghriram, Puskarakidchuram, Baalkutajavalehya etc. Baalchaturbhadra churna which is a very popular anti diarrheal 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 Ativisha 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 malarial 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 anti diarrheal activity when taken with fine powder of Jaiphal (Myristica fragrans), Sunth (Zingiber officinale), 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: In a study, Methanol Fraction of Ativisha, exhibited hypolipidemic activity. The methanic 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 Activity: 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.

Antidiarrheal activity: 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 5h and 7th h of treatment in the study. It also showed significant activity in other parameters like small intestinal transit, fluid accumulation, and PGE2-induced enteropooling models, which restored the altered biochemical parameters as well as prevented Na(+) and K(+) loss.

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

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

Anti-inflammatory activity: 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 Jwatarisara (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.

REFERENCES

1. Paraskevis D, Kostaki EG, Magiorkinis G, Panayiotakopoulos G, Sourvinos G, Tsiodras S. Full-genome evolutionary analysis of the novel coronavirus virus (2019- nCoV) rejects the hypothesis of emergence as a result of a recent recombination event. Infect Genet Evol 2020;79:104212.
2. Million Death Study Collaborators. Bassani DG, Kumar R, Awasthi S, Morris SK, Paul VK, et al. Causes of neonatal and child mortality in India: A nationally representative mortality survey. Lancet. 2010;376:1853–60.
3. Chisholm H: Encyclopædia britannica. Aconite, Cambridge University Press, 1911: 151–152.
4. Paramanick D, Panday R, Shukla SS, Sharma V. Primary Pharmacological and Other Important Findings on the Medicinal Plant Aconitum heterophyllum (Aruna). J Pharmacopuncture. 2017;20(2):89-92. doi:10.3831/KPI.2017.20.011
5. Ukani MD, Mehta NK, Nanavati DD. Aconitum heterophyllum (ativišha) in ayurveda. Anc Sci Life. 1996;16(2):166-171.
6. Subash AK, Augustine A. Hypolipidemic effect of methanol fraction of Aconitum heterophyllum (ativišha) in ayurveda. J Pharmacol Pharmacol. 2012;3(4):224-228. doi:10.4103/2231-4040.104713
7. Konda VG, Erike M, Raghuraman LP, RajamaniKMK. Antioxidant and Nephroprotective Activities of Aconitum heterophyllum Root in Glycerol Induced Acute Renal Failure in Rats. J Adv Pharm Technol Res. 2012;3(4):224-228.
8. Prasad SK, Jain D, Patel DK, Sahu AN, Hemalatha S. Antisecretory and antimotility activity of Aconitum heterophyllum and its significance in treatment of diarrhea. Indian J Pharmacol. 2014;46
9. Ahmad M, Ahmad W, Ahmed M, Zeeshan M, Obaidullah, Shaheen F. Norditerpenoid alkaloids from the roots of Aconitum heterophyllum Wall with antibacterial activity. J Enzyme Inhib Med Chem. 2008;23(6):1018-1022.
10. Atal CK, Sharma MI, Kaul A, Khajuria A. Immunomodulating agents of plant origin. I: Preliminary screening. J Ethnopharmacol. 1986;18(2):133-141.
11. Verma S, Ojha S, Raish M. Anti-inflammatory activity of Aconitum heterophyllum on cotton pellet-induced granuloma in rats. Journal of medicinal plants research. 2010;4(15):1566-9.

**HOW TO CITE THIS ARTICLE**
Mukhopadhyay S, Palbag S. Ethnopharmacology and pharmacology of ayurvedic plant Ativisha. J Ayu Herb Med 2021;7(1):46-48.