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PHARMACOGNOSY AND THERAPEUTIC APPROACH OF VASA (ADHATHODA VASICA)- A COMPREHENSIVE REVIEW.

Vd. Balaji Sawant¹ , Vd. Ashok Prajapati² , Vd. Janhavi Alwe³ , Vd. Shraddha chaudhary⁴

¹ Professor and H.O.D. Department of Dravya Guna, Smt. K.G.Mittal P. Ayurveda Mahavidyalaya, Charni Road, Mumbai-02

² P.G.Scholar, Department of Dravya Guna, Smt.K.G.Mittal P. Ayurveda Mahavidyalaya, Charni Road, Mumbai-02

³ Asst.professor, Department of Dravya Guna, Smt.K.G.Mittal P. Ayurveda Mahavidyalaya, Charni Road, Mumbai-02

⁴ Asst.professor, Department of Dravya Guna, Smt.K.G.Mittal P. Ayurveda Mahavidyalaya, Charni Road, Mumbai-02

Corresponding Author -Vd .Ashok Prajapati Final M.D. Student, Dept. of Dravyagunavidnyan, Smt .K.G .Mittal P .Ayurveda Mahavidyalaya, Charni Road, Mumbai-02.

Contact no-8169502634 ; 07738650952

Email ID -ashokprajapati778866@gmail.com

ABSTRACT-

Background: *Adhatoda vasica* belonging to the family *Acanthaceae* is a medicinal plant having phytoconstituents like alkaloids, phenolics, flavonoids, sterols and their glycoside derivatives. It acts as a cardiovascular protective drug, abortifacient, antitubercular, antimutagenic, antiulcer, antiasthmatic activities, hepatoprotective, antibacterial and antitussive drug. In the modern era, due to the emergence of drug resistant pathogens and rapidly increasing immune disorders, there is an urgent requirement to investigate metabolites for pharmaceutical applications. *Adhatoda vasica* mentioned in Ayurveda classics has also been included in WHO manual- *The Use of Traditional Medicine in Primary Health Care*. The present paper gives an account of updated information on its pharmacological activities and phytochemical constituents. .

Keywords: *Adhatoda Vasica*, *Acanthaceae*, phytoconstituents, pharmacological activity.



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INTRODUCTION:

Ayurveda is the science of life (Ayu + Veda). In Ayurveda there are more than 600 medicinal plants are mentioned which are used either alone or in combination in different kalpanas. Among them Vasa is an Ayurvedic medicinal plant which is used for cough, asthma, breathing problems, nasal congestion, bleeding disorders, upper respiratory tract infections, heavy menstruations, epistaxis etc. Vasa is commonly known as Malabar nut.

VASA

Latin Name: Adhatoda vasica

Family: Acanthaceae

SYNONYMS:^[1-2-3]

Vasaka, Vasica, Vasa, Vasadani, Bhishakmata, Vaidyamata, Sinhika, Sinhasya, Sinhaparni, Sinhamukhi, Sinhalika, Panchmukhi, Vaajidanta, Atrushak, Vrush, Taamra, Maruka, kanthiravi.

- 1) **Atarusha** : It controls the infective respiratory problems.
- 2) **Vasa** : It expels kapha from respiratory systems.
- 3) **Vasica** : Its anti-tussive and bronchodilatory effects are much praised.

- 4) **Vrush** : It has plenty of nectar in the flowers.
- 5) **Vaidyamata** : It is considered as mother of all treatments.
- 6) **Sinhasya** : Denotes its shape, like the mouth of a lion.
- 7) **Vaajidanta** : means horse like tooth.

TYPES: As mentioned by Dr. Desai, besides vasa there are *Justicia picta* and *Justicia gendarussa*. There is another variety named *Adhatoda beddomei* which is abundantly used in Kerala.

It is a small evergreen bush which grows commonly in open plains, especially in the lower Himalayas, India, Sri Lanka, Burma and Malaysia.⁴

BOTANICAL DESCRIPTION: It is a small evergreen perennial shrub with an average height of 1 to 1.5 metres. Its branches are opposite and ascending. Leaves are 7.5 to 20 cm long and 3-6 cm wide. They are light green on top and darker green beneath. They grow in opposite formation and are entirely lanceolate. On drying they become brownish green and smell like strong tea. Its stem is soft. Flowers are white and grow in bunches. Flowers are streaked with two purple lines. The fruit contains four globular seeds.⁵

Prevalence of autoimmune disorders worldwide were 19.1% and its rapidly increasing at rate of 7.1% annually.⁽⁷⁾

MATERIAL AND METHODS-

The Drug Vasa (Whole plant- including leaf, flower) was procured from Smt. K. G. Mittal P. Ayurveda Mahavidyalaya. Kalina Garden. Santacruz. Pharmacognostic (Macroscopical and Microscopical) study of Adhatoda vasica was done at Alarsin Pharmaceutical Laboratories. Andheri. Mumbai.



ANALYTICAL REPORT: ADULSA WHOLE PLANT (Adhatoda vasica)

TEST	SPECIFICATIONS	RESULT
APPEARANCE	Fresh whole plant	Fresh whole plant
COLOUR	Leaf green, flower green white, stem grayish green	Leaf green, flower green white, stem grayish green
ODOUR	Characteristic	Characteristic
TASTE	Bitter	Bitter
MOISTURE CONTENT	NMT 70 %	60.10 %
ASH	NMT 21 %	7.94 %
A I A	NMT 1 %	0.71 %
A S E	NLT 3 %	9.12 %
W S E	NLT 22 %	26.78 %

CHEMICAL COMPOSITION

Adhatoda vasica contains alkaloids, phytosterols, polyphenolics, and glycosides. Its principal constituents are quinazoline alkaloids with vasicine as its chief alkaloid. Leaves have Vitamin C and carotene and an essential oil. Its seeds contain 25.8% of deep yellow oil composed of glycerides of arachidic 3.1%, behenic 11.2%, lignoceric 10.7%, cerotic 5%, oleic 49.9% , linoleic acids 12.3% and β



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sitosterols 2.6%. Besides it has K, Na, Ca, Mg and trace amounts of Zn, Cu, Cr, Ni, Co, Cd, Pb, Mn, Fe. In roots, Concentration level of protein is 8.5%, vasicine 7.5%, vitamin C 5.2%, and fats 2.5%.⁶

THERAPEUTIC USES:⁷

- As Sushrut Acharya has mentioned about Bronchodilator: Vasicine is claimed to have bronchodilator activity. RLX which is a bronchodilator obtained by chemical modification in the molecule of vasicine, inhibits antigen induced mast cell degranulation and histamine secretion from target tissues.
- Antitussive: *Adhatoda vasica* also has antitussive property. It is as effective as codeine on mechanically or electrically and irritant aerosols induced coughing, in rabbits and guinea pigs.
- Asthma Vasa syrup is an excellent medication for asthma. Vasicinone is anti-allergic. Methanolic extracts from the entire plant possess anti-allergic and anti-asthmatic properties.
- Acute Upper Respiratory Tract Infection It acts in the upper respiratory tract by making the kapha thinner and ejecting it out, thus providing relief to the patient.
- Antitubercular activity Bromohexine and ambroxol, semi-synthetic derivatives of vasicine from vasa have growth inhibitory effect on *Mycobacterium tuberculosis*.⁷
- Antibacterial activity the leaves extract of vasa exhibits moderate antibacterial activity against bacteria like *Bacillus subtilis*, *Vibrio cholerae*.
- Radioprotective effects the ethanolic extracts of vasa prevents radiation induced chromosomal damage in bone marrow cells.
- Anti-ulcer activity *Adhatoda* leaf powder showed a considerable degree of anti-ulcer activity.
- Antifeedant and toxic activity Crude methanolic extracts from vasa shows antifeedant and toxic activity against larvae.
- Sucrase inhibitory activity the methanolic extracts from the leaves of vasa showed excellent sucrase inhibitory activity with sucrose as a substrate. The alkaloids, vasicine and vasicinol inhibit sucrase activity, with an IC₅₀ value of 125µM and 250 µM respectively.
- Anti-inflammatory activity Vasicine has anti-inflammatory activity.
- Abortifacient activity Vasa possess abortifacient and uterotonic properties, making it useful for inducing abortions and for stimulating uterine contractions in order to speed child birth.



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- Antidiabetic activity of vasicine⁸

CONCLUSION:

The traditional uses of Vasa help in treating various diseases and is been well known in this brief review. Vasa particularly in curing diabetes is gaining importance in the Ayurvedic pharma industry. Vasa has been widely studied for its phytochemical and pharmacological activities. The clinical trial on Diabetes will be further done in the upcoming days at OPD Dravyaguna Department of Smt. K. G. Mittal P. Ayurveda Mahavidyalaya. Charni road. Mumbai. Thus, the Pharmacognostic, therapeutic study of Vasa shows its efficacy and relevance in the treatment of Diabetes and drug procured from Smt. K. G. Mittal P. Mahavidyalaya Garden, Kalina is of standard quality and can be used for clinical trial.

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