

ASSESSMENT ON BIOLOGICAL ACTIVITIES OF *ADHATODA VESICA*: A REVIEW

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ABSTRACT

In healthcare system the medicinal plants are most commonly used in a whole world. The metabolites that is present in the extract of herbal plants that contain different chemical substance that may produce different therapeutic effects. The *Adhatoda Vesica* herbal plant that is most commonly used is a southeast region for the treatment of different microbial diseases. The methanolic extract of leaf and synthesis of AgNPs is able for the curing of different skin diseases and wound healing purpose. The *Adhatoda Vesica* plant contains a number of secondary metabolites such as alkaloids, saponins, amino acids, carbohydrate, flavonoids and proteins etc. A prolonged intense look of literature data revealed some important biological activities like antibacterial, anti-inflammatory, antifertility, anti-ulcer, anti-tissue, anti-typhoid and anti oxidant, Immunomodulatory, hepatoprotective, and wound healing. The pharmacological and phytochemical review of *Adhatoda Vesica* realized the importance of the medicinal plants.

Keywords: *Adhatoda Vesica*, Microbiological activity, Phytochemistry and Metabolites.

INTRODUCTION

Plants are the natural source of drugs that are used for the treatment and curing of various diseases generated by microorganisms such as bacteria and virus in the body of living organisms¹⁰. The natural products are used to control the complication in the body of living beings. The branches that used herbal medicines for the treatment of various pharmacological diseases are commonly called Ayurvedia, Unani, Homeopathy, Siddha etc. The whole principle of these ancient branches depend upon the availability of herbal plants. Different plants are rich source of chemical substance that is helpful for the analgesic and anti-inflammatory treatments. The *Adhatoda Vesica* and many others species contain high quantity of secondary metabolites, especially Vitamin C, used against for the treatment of various biological activity includes anti-pyretic, anti-diabetic and oxytoxic¹³. About 40% of medicines that are use for the curing of dangerous diseases have plant origins. In Southeast Asia the *Adhatoda Vesica* specie parts are used against throat

irritatious and skin disorders¹⁴. *Adhatoda Vesica* contain large amount of alkaloids. The leaf and root extract of *Adhatoda Vesica* used as medicines in form of tablets⁶. The herbal medicine is slow reactive natural chemical with respect to synthetic drugs. The old medicinal system and modern studies suggested that the use of natural herbs as a medicine that improves the body resistance mechanism against the microorganism effect without any side effects¹⁶.

PHYTOCHEMISTRY

The phytochemical analysis helps to determine the active constituents of *Adhatoda Vesica* on preparing extract by using different solvents such as CCl₄, CH₃OH, C₂H₅OH and n-hexane. 1% conc. Solvent extract of methanol is used for the treatment of wound healing¹⁶. The novel alkaloids present in the areal parts of *Adhatoda Vesica* use for histopathological analysis. The adhatonine and vasicol that are the active alkaloids maintain the respiratory system. Methanolic

extract are very effective for contraction, epithelization, granulation and collagenation treatment⁷.

PHARMACOLOGY

Traditionally all parts of *Adhatoda Vesica* are used as medicines for the treatment of harmful diseases.

Anti-bacterial activity

Kamlesh Chandra Prakash and his co-worker reported the anti-bacterial activity of *A. Vesica*. A phytochemical study realized that the nature and activity of leaves extract of *Adhatoda Vesica* depend upon the solvent used. Methanolic extracts of leaves show different reading in various medium against Gram positive and negative bacteria⁹. The synthesis of AgNPs from the leaf extract of *Adhatoda Vesica* is effective in anti-bacterial activity is reported by Bhumi G* and his fellows¹. Debadin Bose and Someswar Chatterjee also discuss the anti-bacterial activity of AgNPs. They also observe the toxicity of green synthesized silver nanoparticles. The size of AgNPs is in range of 20nm in diameter. They used Disc diffusion method for measuring the antibacterial activity against *Pseudomonas aeruginosa*. The nanoparticles that produce from the leaf extract have ability to stop the growth of bacterial species². John M. Grange a, and Noel J.C. Snell work on biological active constituent (benzylamine, bromohexine etc) that are pH effective. They pH that inhibit the growth of bacteria species as a result they are very effective against diseases of bacteria. SIGNACIMUTHU and this partner study vasicine acetate and 2-acetyl-benzylamine in leaf extract of *Adhatoda Vesica*. Both are naturally occurring alkaloids that are used for the treatment of asthma, cough and the diseases generated by bacterial species¹⁵. The herbal extract such as Acetone, Aqueous, and Ethanol extract show antibacterial activity against Gram positive bacteria is studied by P. Akila, L. Prince and his co-workers. They use agar well diffusion method to check the anti bacterial activity¹².

Anti-inflammatory activity

A. Chakraborty and A. H. Brantner by various experimental analyses studied the anti-inflammatory activity. They use Chorioallantoic membrane test for detection of saponins and active alkaloids that show positive response against Anti-inflammatory activity. Sateesh Belemkar and his co-worker used methanolic extract of *Adhatodavasica N.* and menthol in *Menthapiperita L.* against anti-inflammatory activity. They observe that the methanolic

extract show inhibitory effect against the chemical that are responsible for inflammation. For inhibit the inflammation used different amount of doses of methanolic extract such as 200,400,600mg/kg¹³. J. J. DOSHI and his research fellows also use the leaf extract of *Adhatodavasica* and apply the different patients and observe the anti-inflammatory activity⁴.

Hepatoprotective activity

The hepatoprotective activity of *Adhatodavasica* leaf is studied by Dipankar Bhattacharyya and their co-workers in rats. They use different amount of doses in mg/kg to check the activity³. G. Roja and their research fellows used Acanthaceaeas biomedication. The *Adhatodavasica* contain a large quantity of Ascorbic acid. They are the active constituent to protect liver damage and play role in hepatoprotective activity. The active alkaloids such as vasicine and vasicinone contain 5.98% and 5.2% of dry weight of water shoot extract of *Adhatoda vasica*⁵.

Anti-Ulcer Activity

Anti-Ulcer activity was reported by N. Shrivastava and co-workers. *Adhatodavasica* are the very effective parts in herbal medicines and they are beneficial effects. The anti-ulcer activity of the leaf extract of *Adhatodavasica* is studied with the help of two models. 1. Ethanol-induced 2. Aspirin-induced model. About 80% of activity is noticed by Ethanol-induced model¹⁴.

Anti-tissue activity

The leaves extract of *Adhatodavasica* and their anti-tissue activity in guinea pigs and rabbits is studied by Jayant N. Dhuley. The role of codeine against coughing is similar to the role of anti-tissue activity of *Adhatodavasica* in guinea pigs and rabbits⁶.

Anti-typhoid and anti Oxidant Activity

Manoj Kumar and co-worker studied the anti-typhoid activity of *Adhatodavasica*. The phytochemical studies of leaf extract show that they are very effective for the treatment of acute disease typhoid. The leaf extract have a large amount of anti-oxidant and reducing properties. The growth of *Salmonella typhi* is stopped by the antioxidant. The antioxidant acts as supplement for the patients of typhoid⁸.

Antifeedant and toxic activity

M. M. Sadek study the antifeedant and toxic activity of methanolic leaf extract of *Adhatodavasica*. The toxic studies of leaf extract on *Spodopteralittoralis* larvae is

observed. In artificial diet the leaf extract disc is incorporated a strong toxic effects show against the *Spodopteralittoralis* larvae¹¹.

Immunomodulatory activity

G. Vinothapooshan and K. Sundaruse *Adhatodavasica* leaves extracts of in different solvents (methanolic, chloroform and diethyl ether) to studies the immunomodulatory activity in different animal in the southeast region. Chemotherapeutic agents and other treatment such as cancer the *A.vasica* do not affect the immune system of the animal's body¹⁷.

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