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REVIEW ARTICLE **OPEN ACCESS**

Pharmacological Properties of *Abutilon indicum linn*: an Overview

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ABSTRACT

The plant Abutilon indicum, also known as Indian abutilon or Indian mallow, is a species of the Malvaceae family and is widespread in tropical and subtropical areas. It has been used in conventional medicine for a variety of disorders. This plant has many therapeutic uses, including sedative, anti-inflammatory, antioxidant, demulcent, aphrodisiac, laxative, and diuretic. The plant is useful for Siddha therapies. Tamil people use the bark, root, leaves, flowers, and seeds as medicines. Additionally, the leaves can be used to alleviate pile issues. The phytochemical investigation revealed steroids, alkaloids, saponins, amino acids, flavonoids, and glycosides in the plant material. This plant appears to possess a variety of potential medicinal properties. There have been numerous pharmacological studies done, and there are various biological uses for the leaves, including anti-inflammatory and anti-hyperlipidemic, anti-microbial, wound healing, anti-microbial, and anti-diarrheal activity, have been identified.

Keywords: *Abutilon indicum, Traditional medicines, Pharmacological activities, Medicinal uses, Phytoconstituents*

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INTRODUCTION

South Asia is home to the native plant Abutilon indicum, often known as "Thuthi" or "Kanghi" in Hindi. The Malvaceae family includes the Abutilon genus, which includes roughly 150 seasonal or perennial plants, including shrubs, herbs, and even tiny trees, are widely grown in America, Africa, Asia, and Australia's tropical and subtropical latitudes[1]. Fever can be treated with the roots and leaves of this plant, making it a valued ornamental and medicinal plant. Abutilon indicum is widely grown in Sri Lanka, Bangladesh, Pakistan, and India[2]. The herb is regarded as antibacterial, diuretic, astringent, anthelmintic, and carminative. To cure high fevers, colds, bronchitis, mumps, diabetes, hernias, haemorrhoids, diarrhoea, and other worm infections, it is used topically[3].

TRADITIONAL MEDICINE

Abutilon indicum is a fairly typical roadside plant that is growing as weed in India's hottest regions [4]. The ability of plants to produce various chemical components, such as alkaloids, glycosides, steroids, flavonoids, proteins, amino acids, phenolic compounds, carbohydrates and Saponins, which are then used to treat a variety of diseases, including jaundice, body aches, bronchitis, toothaches, diabetes, fever, cystitis, piles, ulcers, gonorrhoea, leprosy[5]. Additionally, they're used to treat high fever, ringing in the ears, hearing loss, pulmonary tuberculosis, mumps and cough. In ayurvedic treatments for haemorrhoids, diabetes, and menorrhagia, the entire herb is used. In rats, A. indicum leaf extracts exhibit hypoglycemic effects[6].

THERAPEUTIC POTENTIAL OF ABUTILON INDICUM

Larvicidal Activity

An insecticide called a larvicide is used to keep mosquitoes away from your home both inside and outside. Before they can develop into adult mosquitoes, they kill the mosquito larvae. Crude extracts of A.indicum in hexane, ethyl acetate, acetone, petroleum ether ethanol and were tested for their ability to kill larvae. The petroleum ether extract was shown to have the highest larval fatality, and β-sitosterol, whose LD_{50} value for C. Quinquefasciatus is 26.67 ppm was found to be a possible mosquito larvicidal compound[7]. After a 24 hour exposure, the larval mortality was seen. All of the extracts had mild larvicidal properties. However, A. indicum petroleum ether extract was shown to have highest larval mortality rate[8].

Anti Microbial Activity

By measuring the zone of inhibition, extracts from leaves have been shown to have antibacterial activity against both Gram positive and negative strains as well as fungi. When compared to E. coli and Aspergillus niger, the leaves extract of Abutilon indicum had excellent anti-Staphylococcus aureus action (2.5 g/ml) and Candida parapsilosis (2.5 g/ml) at very low concentrations[9]. The antibacterial effects of A. indicum leaf extracts in chloroform, ethanol, and aqueous solutions against Klebsiella pneumoniae, Bacillus subtilis, Salmonella typhi, Pseudomonas aeruginosa Escherichia coli and Staphylococcus aureus, were investigated. The ethanol extract demonstrated the highest antibacterial activity among the different extracts (14, 25, 14, 25, 17, 18 mm), followed by the chloroform extract (13, 17, 8, 15, 15, 20 mm), while the aqueous extract had very little antibacterial action[10].

Analgesic Activity

Analgesics are medications that target the central nervous system and peripheral pain mediators to selectively reduce pain without impairing consciousness. Analgesics are narcotic and non-narcotic. The analgesic activity of ethanol, petroleum ether, chloroform and a dose level of aqueous extract were evaluated against 400mg/kg body weight. Petroleum Analgesics are medications that target the central nervous system and peripheral pain mediators to selectively reduce pain without impairing consciousness. Both narcotic and non-narcotic analgesics exist. Using 400 mg/kg body weight dose, the analgesic effects of ethanol, chloroform, petroleum ether and aqueous extracts were evaluated. Greater analgesic action was seen in the petroleum ether extract. The activity may be the result of peripheral or central analgesic mechanism [11]. It was discovered that petroleum ether extract and benzene extract both had good analgesic effects. When 400 and 600 mg/kg are used as the dose, fixed oil of the plant showed excellent analgesic activity. Eugenol (4-allyl 2methoxy phenol) isolated from Abutilon indicum found to have a powerful analgesic effect[12].

Hepatoprotective activity

The liver is crucial in the control of physiological functions. It is involved in several processes like secretion, metabolism, detoxification and storage of many substances that take place in the liver. One of the most severe illnesses is liver diseases. They are divided into three categories: cirrhosis, hepatosis (non-inflammatory disorders), and Hepatitis (inflammatory liver disease), either acute or chronic (a degenerative condition that leads to liver fibrosis). Toxic substances, excessive alcohol intake, infections, and autoimmune disorders are the main causes of liver illnesses. The liver needs to be protected from all of these chemicals [13].

When given orally to rats, the aqueous leaf extract of *A. indicum* was found to be generally safe, with an LD_{50} value more than 4 g/kg body wt. The altered serum biochemical markers in rats after carbon tetrachloride and paracetamol administration showed considerable liver injury. *A. indicum* aqueous extract pretreatment in rats resulted in considerable protection from the hepatotoxicity caused by paracetamol and carbon tetrachloride. *A. indicum's* aqueous extract is equivalent to silymarin in terms of its considerable hepatoprotective efficacy against paracetamol and carbon tetrachloride [14].

Dash *et al* examined the blood sample and serum sample was estimated for serum glutamic pyruvic transaminase, serum glutamic-oxaloacetic transaminase, serum alkaline phosphatase and total bilirubin. Animals treated with A. indicum significantly reduced CCl4-induced abnormalities[15].

Anti-asthmatic activity

Chronic wheezing, chest tightness, coughing, and breathing difficulties are hallmarks of asthma, a respiratory disease caused by bronchial constriction, inflammation, and increased mucus secretion as a result of bronchial hyperresponsiveness[16]. Dyspnea, chest tightness, coughing and wheezing are some of the symptoms of bronchial asthma that can be treated using a powder produced from the dried aerial parts of A.indicum. It was also shown to enhance lung function. in people with mild to moderate bronchial asthma[17].

Anti-ulcer activity

Studies including aspirin, ethanol-induced, pylorus ligation and acetic acid-induced ulcer models were employed to assess the anti-ulcer activity. Using the aspirin and pylorus ligation method, the extract's effect on gastric pH, gastric content volume, pH, total acidity and free acidity was also assessed[18]. Through pylorus ligation and an ethanol-induced ulceration method, the anti-ulcer effectiveness of Abutilon indicum leaves in albino rats was examined. The presence of secondary metabolites like alkaloids, tannins and flavonoids in the plant extracts might be the reason behind its anti-ulcer potential[19].

Anti-inflammatory activity

These are medicines or other substances that reduce bodily inflammation. Anti-inflammatory agent block various substance in the body that cause inflammation. The anti-inflammatory properties of the leaf's

ethanolic, chloroform, and aqueous extracts were studied. Flavonoids may be responsible for this activity[20].

The carrageenan-induced rat paw edoema model was used to evaluate the anti-inflammatory activity. Petroleum ether, ethanol, chloroform, and aqueous extracts were assessed in comparison to the carrageenan-induced rat paw edoema method at a dose level of 400 mg/kg body weight. The anti-inflammatory activity of different extract were compared with standard Diclofenac. The maximum anti-inflammatory efficacy was observed in the total ethanolic extract, with a percentage of inhibition of 50.48%, which is comparable to indomethacin[21].

Anticonvulsant activity

Wistar rats were used to induce convulsions with ptz and maximum electric shock (MES) to study the anticonvulsant efficacy of Abutilon indicum leaf extracts. At doses of 100 and 400 mg/Kg, It was shown that ethanolic extract delayed the onset of tonic seizures and enhanced the onset of clonic convulsions in PTZ-induced convulsions, suggesting a potent anti-convulsant activity.

In compared to the control group, ethanolic and aqueous extracts at doses of 100 and 400 mg/kg showed a protective effect in MES-induced seizures, increased the initiation of clonic convulsion time and decreased extensor time. This anticonvulsant activity of the extracts was thought to be caused by their linoleic acid and/or flavonoid content. [22].

Antidiarrhoeal activity

Abutilon indicum leaf extracts were investigated for their anti-diarrheal properties. The methanolic and aqueous extracts suppressed intestinal peristalsis, gastrointestinal motility, and enteropooling produced by PGE2, which significantly reduced diarrhoea. [23].

CONCLUSION

Abutilon indicum is a valuable medicinal herb, based on a variety of therapeutic benefits found in conventional medicine. A significant medicinal plant with a broad pharmacological spectrum is Abutilon indicum linn, according to a substantial body of scientific literature. A number of pharmacological research using extract from the various plant parts have been done. The parts of plant that are utilized the most for ethnomedicine are the leaves and seeds. Beta-sitosterol, tocopherol oil, caffeic acid, fumaric acid, vanillin, parahydroxybenzoic acid, sesquiterpene, and several components of essential oils like alpha-pinene, caryophyllene, and caryophyllene oxide are just a few of the outstanding biologically active substances found in the plant. It has been stated that the plant, which is widely utilised in India's conventional medicine system, possesses anti-inflammatory, hepatoprotective, antifungal, lipid-lowering, wound-healing and antibacterial activities. Abutilon indicum has a lot of potential for future study because of its therapeutic uses, and more pharmacological and clinical research should be done to uncover this plant's full potential.

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CONFLICT OF INTEREST

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