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Review Article

Medicinal properties of *Abutilon Indicum*

Abstract

Abutilon indicum is a common Indian shrub, belonging to the family Malvaceae; Also known as Mallow in english, *Abutilon indicum* is used as a medicinal plant. It has been extensively used as a traditional medicine as a laxative, emollient, analgesic, anti-diabetic, anti-inflammatory and blood tonic agent and also in the treatment of leprosy, urinary disease, jaundice, piles, relieving thirst, cleaning wounds and ulcers, vaginal infections, diarrhea, rheumatism, mumps, pulmonary tuberculosis, bronchitis, allergy, blood dysentery, some nervous and some ear problems. Various studies on the plant extract have been performed to confirm the anti-oxidant, anti-bacterial, analgesic, anti-inflammatory, anti-cancer, hepatoprotective, immuno-modulatory and larvicidal activities of the plant. This plant is often used as a medicinal plant and is considered invasive on certain tropical islands. In traditional medicine, *A. indicum* is used as a aphrodisiac, demulcent, diuretic, laxative, pulmonary and sedative (leaves). The bark is astringent and diuretic; laxative, expectorant and demulcent (seeds); laxative and tonic, anti-inflammatory and anthelmintic (plant); analgesic (fixed oil); diuretic and for leprosy (roots). The plant is very much used in Siddha medicines. In fact, the bark, root, leaves, flowers and seeds are all used for medicinal purposes by Tamils. The leaves are also used to treat for pile complaints. The flowers are traditionally used to increase semen in men. The phytochemical analysis showed the Presence of Alkaloid, Saponins, Amino acid, Flavonoids, Glycosides and steroids. This plant exhibits several potential pharmacological activities. A review on the various studies on the plant has been provided for the purpose of understanding its medicinal properties.

Introduction

Abutilon indicum, commonly called as “Thuthi” or “Kanghi” in hindi, is a native plant of South Asia. Nature is a best friend of our pharmacy field. Natural drugs are effective in action without side effects. *Abutilon indicum* (Linn.) sweet (Malvaceae) commonly called ‘Country Mallow’ is a perennial plant up to 3 m in height. Medicinal plants are the nature’s gift to human beings to make disease free healthy life. It plays a vital role to preserve our health. India is one of the most medico- culturally diverse countries in the world where the medicinal plant sector is a part of time- honored tradition that is a respected even today. Here, the main traditional systems of medicine include Ayurveda, Unani and Siddha [1]. In India different parts of medicinal plants have been used for curing various diseases from ancient times. In this regard, one such plant is *Abutilon indicum*. The *Abutilon* L. genus of the Malvaceae family comprises about 150 annual or perennial herbs, shrubs or even small trees widely distributed in the tropical and subtropical countries of America, Africa, Asia and Australia. Some of the plants belonging to the species are amongst much acclaimed Ayurvedic herbs and in the recent past there has been a renewed scientific interest in exploring the specie [2].

Distribution

Abutilon indicum (Linn.) Sweet family Malvaceae commonly called as ‘Country mallow’ (English), ‘Kanghi’ (Hindi) and ‘Atibala’ (Sanskrit). It is a perennial shrub, softly tomentose and up to 3 m in height. The plant is found in India, Sri Lanka, tropical regions of America and Malesia [3]. It is found as a weed in sub-Himalayan tracts, hills up to 1200 m and in hotter parts of India.

Botanical description

The leaves are ovate, acuminate, toothed, rarely subtrilobate and 1.9–2.5 cm long. The flowers are yellow in color, peduncle jointed above the middle. The petioles 3.8–7.5 cm long; stipules 9 mm long; pedicels often 2.5–5 mm long, axillary solitary, jointed very near the top; calyx 12.8 mm long, divided in to middle, lobes ovate, apiculate and corolla 2.5 cm diameter, yellow, opening in the evening. The fruits are capsule, densely pubescent, with conspicuous and horizontally spreading beaks. The stems are stout, branched, 1–2 m tall, pubescent. The seeds are 3–5 mm, reniform, tubercled or minutely stellate-hairy, black or dark brown [4,5].

Synonyms: Rishyaprokta, Kankatika, Balika, Rishagadha, Bhuribala.

Synonym(s): *Sida indica* L.,

Vernacular names of *Abutilon Indicum*

Hindi - Kanghi, Kakahi

English - Country mallow, Indian mallows

Bengali - Petari

Malayalam - Dabi, Uram

Guajarati - Khapat, Kansi, Dabli

Marathi - Mudra, Petari

Tamil -Tutti, Paniara, Hutti

Telugu -Tutturubenda

Scientific classification

Kingdo: Plantae

Order: Malvales

Family: Malvaceae

Genus: *Abutilon*

Species: *Abutilon Indicum*

Common name: *Abutilon*, Indian mallow.

Habitat: Present in sub-Himalayan tract and hills up to 1,200 m and hotter parts of India.

Traditional applications

It is useful in gout, tuberculosis, ulcers, bleeding disorders, and worms. It can be used as Digestive, laxative, expectorant, diuretic, astringent, analgesic, anti inflammatory, anthelmintic, demulcent and aphrodisiac. Decoction used in toothache and tender gums. Demulcents of leaves are locally applied to boils and ulcers. Roots are prescribed in fever, chest affection and urethrities. *Abutilon indicum* (Linn.) Figure 1 is three meter in height. Traditionally, Root and bark are used as aphrodisiac, anti diabetic, nervine tonic, and diuretic. Seeds are used in urinary disorders. The seeds are used as a laxative



Figure 1: *Abutilon indicum*.

in piles and in the treatment of cough. The Phyto chemical investigation of *A. indicum* leaves showed the presence of amino acids, glucose, fructose and galactose. From the roots, non-drying oil consisting of various fatty acids viz. linoleic, oleic, stearic, palmitic, lauric, myristic, caprylic, capric and unusual fatty acid having C [6], carbon skeleton, sitosterol, and amyirin from unsaponifiable matter were yielded.

Research on *Abutilon Indicum*

Analgesic and anti-inflammatory activity

Anti diabetic activity

Anti oxidant potential

Major chemical constituents

Hescoses, nn-alkane mixtures, alkanols, B sitasterol, Vanillic, p-coumaric, acceic, fumaric and amino acids, alantaolactone, iso alantolactone etc.

Antioxidant and antibacterial activity of *A. Indicum*

Investigated the antioxidant and antibacterial activity of *A. indicum* and *A. muticum*. Total antioxidant activity of both oils was checked by ABTS, FRAP, DPPH and oleic acid peroxidation methods. These methods indicated the presence of both the slow reacting and fast reacting components in the seed oils of both the herbs. The seed oil of *Abutilon indicum* and *Abutilon muticum* showed broad spectrum activity as they were active against Gram-positive and Gram-negative bacteria. The findings reveal seeds of *Abutilon species*, indigenous to Pakistan to be potentially valuable herb for oil production, delivery of drugs and cosmetic active ingredients [7].

Analgesic activity of *A. Indicum*

Analgesic potential of various extracts of root of *Abutilon indicum* Linn was evaluated by [8]. They subjected the powdered root (900 g) to successive solvent extraction with solvents in increasing order of polarity viz. petroleum ether (60-80 C°), methanol and ethanol by soxhlet apparatus for 72 hrs. They extracted marc by cold maceration for 72 hrs to obtain water soluble extract. Peripheral analgesic activity was studied using acetic acid induced writhing method in Swiss albino mice (20-30 g) while central analgesic activity was evaluated by tail flick method and tail immersion method. Results indicated that all the tested extracts except methanol extract exhibited significant analgesic activity in both animals' models. Petroleum ether extract showed higher analgesic activity. The activity may be related with central mechanism or due to peripheral analgesic mechanisms. Thus they authenticated the traditional use of *A. Indicum*.

Anti-inflammatory activity of *A. Indicum*

Anti-inflammatory action of *Abutilon indicum* (L.) Sweet leaves by HRBC membrane stabilization technique was investigated The ethanolic, chloroform and aqueous extracts of the leaves were screened for anti-inflammatory activity. They have taken the prevention of hypotonicity induced HRBC

membrane lysis as a measure of anti-inflammatory activity. All Three fractions showed a biphasic effect on the membrane stabilization. Their activities were found to be comparable to that of standard drug diclofenac sodium. However their activities decreased with time. The extracts were supposed to be act either by inhibiting the lysosomal enzymes or by stabilizing the lysosomal membrane [9].

Anticancer activity of *A. Indicum*

The study medicinal plants namely *Abutilon indicum* and *Blumea mollis* were chosen to screen for potential anti-oxidant properties and cytotoxic activity. The extract was also screened to assess the antioxidant activity using FRAP, 1, 1-Diphenyl-2-picrylhydrazyl [DPPH] radical scavenging activity and Nitric Oxide radical inhibition estimated by the use of Griess Illosvoy reaction with slight modification. These extracts show anti-oxidant properties as well as inhibitory effect on cancer cells with the increased concentration and duration [10].

Hepatoprotective activity of *A. Indicum*

A study was carried out to determine the hepatoprotective activity of aqueous leaf extract of the plant against carbon tetrachloride- and paracetamol- induced hepatotoxicity. The LD50 value of the extract was found to be higher than 4g/kg body weight when administered orally to rats. The study also showed that treatment of rats with carbon tetrachloride and paracetamol increased the levels of serum glutamic oxaloacetate transaminase, serum glutamic pyruvate transaminase, alkaline phosphate, total bilirubin and direct bilirubin and decreased liver glutathione levels. Pretreatment with the extract decreased the levels of serum glutamic oxaloacetate transaminase, serum glutamic pyruvate transaminase, alkaline phosphate, total bilirubin and direct bilirubin and increased liver glutathione levels restoring normalcy. This effect was comparable to that of the standard silymarin. The mechanism of action of the extract was found to be due to interference with cytochrome P450 which blocked the production of free radicals. It has been speculated that in case of paracetamol induced hepatotoxicity, the hepatoprotective effect of the extract could be due to promotion of glucuronidation [11].

Immuno modulation activity *A. Indicum*

“Bala compound” is an Ayurvedic preparation which is used to protect infants from common diseases by stimulating their immune system. One of the major ingredients of this Ayurvedic preparation is *A.indicum*. A clinical study with this compound has confirmed that administration of the compound to neonates resulted in increase in antibody levels such as IgG, IgM and IgA after three and six months of administration [12]. The immunomodulatory activity of ethanolic and aqueous extract of leaves of *A. indicum* (200mg/kg and 400 mg/kg) by heamagglutination antibody (HA) titre, delayed type hypersensitivity (DTH), neutrophil adhesion test and carbon clearance test. Study revealed that extract showed a significant increase in both primary and secondary HA titre. It also showed significantly potentiated DTH reaction and increase in percentage neutrophil adhesion test. The results of the study reported that both the extracts were found to have a significant

immunostimulatory activity on both the specific and non specific immune mechanisms. This activity was said to be attributed to the presence of flavonoids (quercetin), alkaloids, tannins, saponin glycosides and phenolic compounds [13].

Larvicidal activity of *A. Indicum*

Larvicidal activity of crude ethyl acetate, hexane, acetone, petroleum ether and methanol extracts of five medicinal plants such as *A. indicum*, *Aegle marmelos*, *Jatropha gossypifolia*, *Euphorbia thymifolia* and *Solanum torvum* were assayed for their toxicity against the early fourth-instar larvae of *Culex quinquefasciatus*. The larval mortality was observed after 24h exposure. All extracts demonstrated moderate larvicidal effects. However, the maximum larval mortality was found in petroleum ether extract of *A. indicum*. In the present study, bioassay-guided fractionation of *A. indicum* led to the separation and identification of a β -sitosterol as a potential new mosquito larvicidal compound with LC50 value of 11.49, 3.58 and 26.67 ppm against *Aedes aegypti* L, *Anopheles stephensi* Liston and *C. quinquefasciatus* Say (Diptera: Culicidae), respectively. H NMR, C NMR and mass spectral data confirmed the identification of the active compound. β -sitosterol has been recognized as the active ingredient of many medicinal plant extracts. All the crude extracts when screened for their larvicidal activities indicated toxicity against the larvae of *C. quinquefasciatus*. This article reports the isolation and identification of the β -sitosterol as well as bioassay data for the crude extracts. There are no reports of β -sitosterol in the genus *A. indicum* and their larvicidal activities are being evaluated for the first time. Results of this study demonstrated that the petroleum ether extract of *A. indicum* may be considered as a potent source and β -sitosterol as a new natural mosquito larvicidal agent [14].

Conclusion

The extensive survey literature reviewed that *Abutilon indicum* Linn, is an important medicinal plant with diverse pharmacological spectrum. Lot of pharmacological studies have been carried out with extract of the different parts of the plant. The present review summarizes some important pharmacological studies on hepatoprotective, wound healing, immunomodulatory, analgesic, antimalarial, antimicrobial, hypoglycemic activity *Abutilon indicum* and phytochemical investigations and isolated principles from them, which can be investigated further to achieve lead molecules in the search of novel herbal drugs. Due to medicinal properties there is enormous scope for future research on *Abutilon indicum* and further clinical and pharmacological investigation should be conducted to investigate unexploited potential of this plant. *Abutilon indicum* have many more pharmacological properties like, the main chemical constituents are carbohydrates, steroids, glycosides, flavonoids, tannins and Phenolic compounds. Hence this review article, effort has been taken to collect and compile the details notes on *Abutilon indicum* which will be useful to the society to venture into a field of alternative systems of medicine.

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