

Bauhinia variegata: A Promising Herb

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ABSTRACT

No plant in this earth is bereft of medicinal properties. India is rich in flora of medicinal plants that are being utilised for ages in traditional Indian medicine to cure human illnesses. Nature has blessed India with abundance of biological diversity, including over 40,000 plant species. India has about 12 percent of the global plant wealth. India's flora is among the richest in the world, owing to the country's diverse temperature, topography and habitat. *Kanchnara* has been widely used in *Ayurveda* since ages. Researchers are making substantial efforts to study the chemical and biological potential of this plant. This review article is an endeavour of the author to represent detailed description of literature on plant profile, phytochemistry and pharmacological activities of *Bauhinia variegata*.

Key Words *Anti-inflammatory, Bauhinia variegata, Kanchnara*

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INTRODUCTION

Bauhinia variegata often referred as mountain ebony is a hairy branched, medium sized tree belonging to family Fabaceae. Since ancient times, its stem bark, roots, flower, buds, leaves, seeds are being used for the treatment of many diseases like- diarrhoea, haemorrhoids, dysentery, oedema, leprosy, goitre, tumour, dyspepsia etc. The plant contains active ingredients like terpenoids, flavonoids, steroids, tannins, saponins, glycosides, reducing sugars as active constituents that bring out its biological effects. *Bauhinia purpurea* has anti-inflammatory, hepatoprotective, antiulcer, immunomodulatory hypolipidemic, antimicrobial, nephroprotective,

anticancer, antioxidant, antihelminth, antiulcer, hepatoprotective and wound healing effects.

DISTRIBUTION

It is prevalent worldwide, favouring the low hills of India with elevations reaching around 5000 feet, but it is mostly cultivated as an ornamental tree throughout the plains¹.

MORPHOLOGY

Bauhinia variegata Linn. is a small to medium sized tree having hairy branches. The leaves are split halfway down, 4.5-15cm long, and a cordate base with 11-15 nerves. Huge, variegated white-purplish flowers cling to leafless branches. Petals are 4-5 cm long, ovate obovate, the highest darker with purple veins, and the calyx is 2-2.7 cm long, hairy, and toothed at the apex. The pod

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is flat, glabrous, and 15–30 cm long containing 10–15 seeds. Flowers bloom from February to April, while Fruiting occurs in May to August².

HABITAT

Distributed over Punjab, central, south India, and China. It grows in tropical climates and is widespread throughout India. It is found wild in the sub-Himalayan and outer Himalayas at elevations of up to 1300 metres.

TAXONOMICAL CLASSIFICATION³

Table 1 Taxonomical Classification

Kingdom	Plantae
Sub-Kingdom	Tracheobionta vascular plants
Super Division	Spermatophyte- flowering plants
Division	Magnoliophyta- Flowering plants
Class	Magnoliopsida- Dicotyledons
Sub class	Rosidae
Order	Fabales
Family	Fabaceae
Genus	Bauhinia
Species	variegata
Botanical name	Bauhinia variegata Linn

CHEMICAL CONSTITUENTS

Presence of terpenoids, flavonoids, tannins, saponins, reducing sugars, steroids and cardiac glycosides was found when phytochemical screening of n-hexane chloroform, ethyl acetate and methanolic fractions of *Bauhinia variegata* flowers was done⁴.

PHARMACOLOGICAL ACTIVITY

Anti-inflammatory

Mohammed MA et al., 2009 identified anti-inflammatory activity in *Bauhinia variegata* and reported novel triterpene saponins which reduces oedema accompanied by significant reduction in

Prostaglandin level in serum, liver homogenate, and granulomas. Reduction in hepatic and pulmonary granuloma diameter was observed after treatment with compound 9 which was thought to be attributable to its anti-inflammatory effect⁵.

A novel flavonol glycoside 5,7,3',4'-tetrahydroxy-3-methoxy-7-O- α -L-rhamnopyranosyl (1 \rightarrow 3)-O- β -galactopyranoside taken from the roots of *Bauhinia variegata* showed substantial anti-inflammatory activity⁶.

Antigoitrogenic

The effects of *B. variegata* at a dose of 200mg/day were tested on rats with goitre caused by neomercazole and found to be useful in restoring the goitrogenic thyroid to normal levels⁷.

Anti-Microbial

Mishra A et al. (2013) observed antibacterial activity and discovered *Kanchnar* possesses antimicrobial activity against Gram-negative bacteria. The extract of leaves of *B. Variegata* plant suppressed bacterial growth. *Kanchnar* has a somewhat restricted antibacterial spectrum. *E. coli*, *Pseudomonas* species, and *Klebsiella pneumoniae* are all sensitive organisms. The polar extract proved efficient against *E. coli*, *Pseudomonas*, and *K. pneumoniae*⁸. In *Staphylococcus aureus*, administration of bark powder of *Bauhinia variegata* demonstrates antibacterial, bio-enhancing, and anti-inflammatory activities⁹.

Hypolipidemic

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In rats, aqueous and ethanolic extracts of *B. variegata* root at dose of 200 and 400 mg/kg body weight significantly reduced cholesterol and triglyceride levels ($P \geq 0.01$). VLDL levels were dramatically lowered ($P \geq 0.05$), while HDL levels significantly increased¹⁰.

Antiulcer

The ethanolic extract of *Bauhinia variegata* decreased the gastric output volume, total free acidity, and ulcer index in gastric ulcer caused by pyloric ligation and in aspirin-induced ulcer model in rats¹¹.

Haematinic

Hematinic activities of *B. variegata* was found when aqueous and ethanolic extract of stem bark of *B. variegata* raised the hemoglobin concentration of blood in hemolytic anemic rats¹².

Anti-tumor

B. Raj Kapoor et al., 2003 investigated the anti-tumor potential of *Kanchmar* and reported that the aqueous and ethanolic extract of stem of the *B. variegata* demonstrated an anti-tumour impact on swiss albino mice against dalton's ascetic lymphoma (DAL)¹³.

Effect on Wound Healing

Incision and Excision wound models in albino Wistar rats were utilised to assess the wound healing activities of ethanolic and aqueous extracts of *Bauhinia variegata* root at doses of 200 and 400 mg/kg body weight, respectively. Both aqueous and ethanolic extracts of the root of *Bauhinia variegata* at both doses induced considerable wound healing via excision and

incision wound models, which was comparable to the standard (framycetin) in the excision wound model¹⁴.

Immunomodulatory

The ethanolic extract of *B. variegata*'s stem bark showed immunomodulatory effect on both primary and secondary antibody responses. It also raised the phagocytic index and percentage of neutrophil adhesion¹⁵.

Hepatoprotective

Bauhinia variegata showed hepatoprotective activity against carbon tetrachloride induced hepatotoxicity in rats, which were treated with *B. variegata* stem bark ethanolic extract as per the dose of 100 and 200 mg/kg orally. It significantly decreased the level of AST, ALT, ALP and GGTP¹⁶.

CONCLUSION

The rich Indian medicinal flora is being used from centuries for several ailments, *Bauhinia variegata* being one such plant possessing multi-functional effects. This paper highlights the detailed profile of *Bauhinia variegata* along with its medicinal importance. A critical evaluation of the literature revealed that it contains different chemical constituents like terpenoids, flavonoids, tannins, cardiac glycosides etc that are responsible for various activities. This paper also presented the various pharmacological analysis that have been executed to justify the anti-inflammatory, immunomodulatory hypolipidemic, hepatoprotective, antiulcer

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antimicrobial, nephroprotective, anticancer, antioxidant, antihelminth, antiulcer, hepatoprotective and wound healing effects of this wonder drug *Bauhinia variegata*. There is still scope for further analysis to unveil the hidden medicinal properties it possesses.

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