



## Review Article

# An overview on the Pharmacognosy and Pharmacological activities of the *Bauhinia acuminata* including its other Species

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### ABSTRACT

These species are germinated nearby to tropical southeastern Asia. The fundamental names of white Bauhinia, white orchid-tree, and bone-chilling orchid-tree. The Bauhinia species have a great therapeutically effect and traditional properties of some specific disease and disorder. They have richly amount of flavonoids, quercetin, kaempferol, saponins, steroid, protein, phenols, tannins, and glycoside. The plant species have reported various experimental pharmacological activity that's like antinociceptive, antibacterial, antifungal, antidiabetic, stimulus, membrane stabilizing, and antimicrobial, ameliorative effect in chronic arsenicosis, hepatoprotective, carbon tetrachloride induced toxicity, antidiarrheal, cancer.

### INTRODUCTION


The therapeutic plants have been basic job in the development of human culture. As an origin of medication, medicinal plants have consistently been at cutting edge practically all societies of developments. The traditional plants a number of significant are created by rich resources of herbal medicinal plants. For a great healthful plants have been utilized to treat wellbeing issues, it also include flavor and nourishment to prevent syndrome epidemics. The optional metabolites

created by the plants are normally responsible for the organic qualities of plant species utilized all through the world. The microbial development in various circumstances is constrained by plant denote items. In this survey we gave general review of the medicinal plants [1].

*Bauhinia acuminata* family caesalpiaceae is estimated as medicinal important in the traditional arrangement of medicine and used broadly level for the treatment of fever, tumors, skin infections, inflammation, headache, etc [2]. This evergreen

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shrub distributed in Southeast Asia, Indonesia, Philippines and Malaysia [3]. White *Bauhinia* is one of the ongoing therapeutic plants frequently called as “Tapakuda” or “Bunga perak” by Malays, “Safed kachnar” by India and logically named as *Bauhinia acuminata* L. They have 200 species in the family of *Bauhinia acuminata*. This plant originates from the India and these days generally planted in the tropics and warm locales [4] including Malaysia. This is an ideal little tree for places where you do not need anything wild to dominate. It will become close to a few meters like (2 to 3 m tall) and won't occupy a lot of room or hold anyone up. This plants is very harmless. Wonderful white blossoms spread this tree in spring and fill the air with a sweet perfect odor. The white blossoms appear as though snowflakes holding tight the branches. Now and then it is called snowy Orchid tree. The leaves are molded similar to a cow's foot [5]. A decoction of the bark or leaves is given in biliousness, venereal maladies, and stone in bladder, infection and asthma. It improves processing. The flowers are eaten raw and have a cooling effect. The decoction method are used for part of roots is boiled with oil and applied to burns [6]. Several chemical constituent present in *Bauhinia acuminata* such as 3 phthalic acid esters, palmitic acid phthalic acid, gallic acid ursolic acid, quercetin, kaempferol, catechine, resveratrol, sesquiterpine, carbohydrates, phytosterols, terpenoids, saponins, tannins, flavonoids, alkaloids and amino acid [7] [8] [9] [10].



Fig-1 *Bauhinia acuminata*

## PLANT PROFILE

Its bush 78.74 to 118.11 inches growing to a height. Leaves are 0.08 to 0.15 meters long, bilobed and broad, apical cleft from the tip to about 1/3 of the length of the leaves. Base is fairly cordate and the projection are intense. Petioles is 0.015 to 0.04 m in length. Flower are white in shading with five petals, 10 yellow tipped stamens, a green stigma and it has a fragrant smell. The natural product is a unit with 0.075 to 0.15 m long and 0.015 to 0.018 m wide, hard, level, dehiscent and ten to 15 seeds [11] [9].

## VERNACULAR NAME –

English	Mountain Ebony
Hindi	Safed Kachnar
Tamil	Vellai Mandaarai
Manipuri	Chingthrao Angouba
Malayalam	Mandaoram,
Assamese	Boga kotora kanchan, Mati - Katota
Sanskrit	Sivamali
Kannade	Kanchan

## GEOGRAPHICAL DISTRIBUTION

*Bauhinia acuminata* is generally developed for their decorative qualities require extremely less space to develop. The species happens generally in deciduous woodlands and scour. *Bauhinia acuminata* is scattered tropical to subtropical & warm temperature Asia, and tropical regions of Africa and America. *Bauhinia acuminata* leaves found that the upper Miocene Xiaalongtan deposits from China, Wenshan, Southeast Yunnan.

## PLANT DESCRIPTION

*Bauhinia acuminata* grow to 2-3 meters tall. *Bauhinia* species, leaves are shaped like ox hoof and bilobed, 6-15 cm long and broad, with the apical cleft up to 50mm deep, and petiole is 15mm to 40mm long. The fruit pod is 7.5-15 cm in length and 1.5-1.8cm wide. The flowers are aromatic, with 5 white petals, green stigma and a 10 yellow tipped stamen and the diameter across 8-12cm [12].

ETHANOPHARMACOLOGICAL [12, 13, 14, 8, 15,].

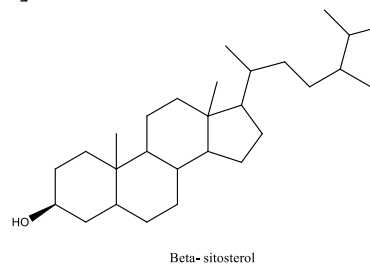
**Table 1: Ethnopharmacology**

Name of plant	Plant part	Traditional uses	References
Bauhinia acuminata	leaves	Gastrointestinal, skin and venereal diseases, leprosy. Acute and chronic pain, skin ailments, cancer, diabetes, throat infections and asthma.	Alharbi N.S. <i>et al.</i> , 2018 Padgaonkar A.V. <i>et al.</i> , 2018
	flower	Antioxidant, anti-inflammatory, anthelmintic, skin diseases, fever, wound healing and as antidiabetic and Antimicrobial, properties.	Biswas P., Panda S.K., Pani S., 2019
	bark	Gastrointestinal, skin and venereal diseases, leprosy. Acute and chronic pain, skin ailments, cancer, diabetes, throat infections and asthma.	Alharbi N.S. <i>et al.</i> , 2018 Padgaonkar A.V. <i>et al.</i> , 2018
	stem	gastrointestinal, skin and venereal diseases, leprosy Acute and chronic pain, skin ailments, cancer, diabetes, throat infections and asthma.	Alharbi N.S. <i>et al.</i> , 2018 Padgaonkar A.V. <i>et al.</i> , 2018
	root	Burns gastrointestinal, skin and venereal diseases, leprosy Acute and chronic pain, skin ailments, cancer, diabetes, throat infections and asthma.	Wealth of India 1998 Alharbi N.S. <i>et al.</i> , 2018 Padgaonkar A.V. <i>et al.</i> , 2018

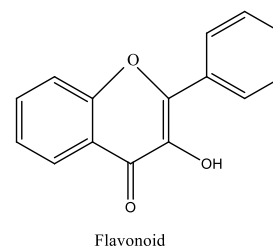
### PHYTOCHEMICAL ACTIVITY AND CHEMICAL CONSTITUENT

This types of blooming thorny bush neighbourhood to tropical south-eastern Asia. The leaves, bark, root, flower and seed, of this plant are utilized in conventional drug. It is utilized in the treatment of glandular swelling, skin ailments and ulcer. The substance constituents found in *Bauhinia acuminata* were nutrient C,  $\beta$  sitosterol (Fig-2), lupeol, kaempferol, 3, 5, 7-dehydroxy and 5, 7 dimethoxy-flavanone-4-o- $\alpha$ -L-rhamnopyranosyl- $\beta$ -D-glucopyranosides. *Bauhinia acuminata* flavonoids (Fig-3) indicated nearness of kaempferol, quercetin (Fig-4), and Apigenin. Kaempferol (Fig-5), quercetin, and Apigenin were available in both the species. Quercetin i.e quercetin-3-glycoside (Fig-6) was available in *Bauhinia acuminata* while quercetin-7-glycoside [16]. A few substance compound including palmitic acid, were distinguished from

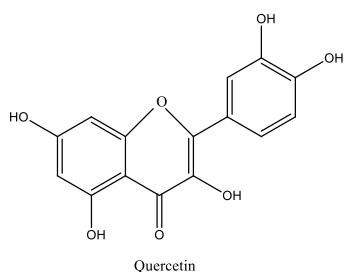
the leaves of *Bauhinia acuminata* [7]. A few substance constituents of *Bauhinia racemosa* have been recognized essentially as flavonols, coumarins, triterpenoids, stilbenes, steroids and tannins [17].



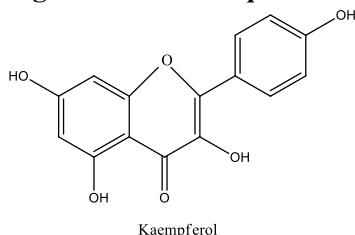
**Fig-2 Structure of beta sitosterol**



**Fig-3 Structure of flavonoid**



**Fig-4 Structure of quercetin**



**Fig-5 structure of kaempferol**

## PHARMACOLOGICAL PROFILE

They have a number of effects of pharmacological action of the plant incorporates against membrane stabilizing, nociceptive, anti-inflammatory, antidiabetic, hepatoprotective / carbon tetrachloride induced toxicity, antidiarrheal, antibacterial, antimicrobial, anticancer, and ameliorative effect in chronic arsenicosis.

## PHARMACOLOGICAL STUDIES

### Antimicrobial activity and mosquito larvicides

The antimicrobial activity reported by previous research paper which is mainly used as a leaves part of *Bauhinia acuminata*. Study assessed silver nanoparticles manufactured with leaves extract of *Bauhinia acuminata*. The aqueous concentrate was utilized as a topping and decreasing agent. The high antimicrobial activity showed by AgNPs. The estimated was larvicidal action against intestinal sickness, zika infection (that produced by mosquito bites), and filariasis vector (that affect the lymph nodes, lymph vessels). Results recommended the *Bauhinia acuminata* integrated AgNPs have promising potential in antimicrobial nourishment bundling just as a foliar splash to control plant pathogens, to coordinate the viability of fungicidal and larvicidal details [14].

### Antibacterial activity

Rough concentrate from seed pieces of *Bauhinia acuminata* indicated solid antibacterial movement against different pathogenic gram positive and gram negative microscopic organisms, the most touchy, *Bacillus subtilize* and the least delicate, *Pseudomonas aeruginosa* [18].

### Antidiarrheal and antimicrobial activity

Study assessed the methanolic concentrates of *Bauhinia acuminata* for antidiarrheal and antimicrobial movement. A rough methanolic remove demonstrated noteworthy antidiarrheal action with a huge decrease in magnesium instigated enter polling and portion subordinate impact in castor oil prompted loose bowels. Study not given proper to show any antimicrobial movement [19].

### Anti-nociceptive activity

Study assessed watery and alcoholic leaf removes for intense harmfulness and in tentatively initiated torment in creatures. Intense harmfulness concentrate by OECD rule 423 indicated the two concentrates were sheltered at portion of 5000 mg/k. In hot plate test, the two concentrates indicated essentially ( $p < 0.001$ ) antinociceptive movement. In hot plate test, the two concentrates noteworthy diminished ( $p < 0.001$ ) the quantity of squirms. In tail drenching test, the two concentrates demonstrated noteworthy increment in tail withdrawal reaction ( $p < 0.001$ ) [8].

### Antioxidant

Study assessed methanol concentrate of leaves and different divisions of *B. acuminata* for biologic screening, complete phenolic substance and cancer prevention agent action. Complete phenol content extended from 15/90 mg of GAE/g extractives to 124.80 mg GAE/gm of extractives. The fluid concentrate demonstrated most elevated phenolic content. Cell reinforcement action of IC50s in DPPH strategy went from 22.01 to 77.79. Of the extractives, carbon tetrachloride demonstrated most elevated free radical searching movement [20].

### **Cytotoxic / thrombolytic**

Study evaluated the cytotoxic and thrombolytic movement of a methanolic concentrate of leaves of *Bauhinia acuminata*. The concentrate demonstrated astounding cytotoxic action in salt water shrimp lethality bioassay, practically identical to vincristine sulphate. It demonstrated noteworthy thrombolytic impact utilizing streptokinase as standard [3].

### **Membrane stabilizing activity**

Study assessed methanol concentrates and parts of leaves of *B. acuminata* for antimicrobial screening and layer balancing out movement. Results indicated profoundly compelling layer balancing out action as prove by avoidance of lysis of erythrocyte by heat and hypotonic arrangement. In this examination, the antimicrobial movement was irrelevant [7].

### **Ameliorative effect in chronic arsenicosis**

Study assessed the ameliorative impact of *B. acuminata* stem bark powder against  $\text{NaAsO}_2$  prompted poisonousness in grown-up pale-skinned person rodents. Treatment with stem bark powder fundamentally ( $p < 0.06$ ) diminished arsenic aggregation in tissues, hair, and excrement. Results demonstrated oral treatment with the stem bark powder could improve initiated arsenicosis [21].

### **Hepatoprotective / carbon tetrachloride induced toxicity**

Study assessed the hepatoprotective movement of *B. acuminata* against carbon tetrachloride actuated hepatotoxicity. Hepatic harm was initiated by  $\text{CCl}_4$  in the mix with olive oil 1:1 in a solitary portion. Results indicated hepatoprotective action as prove by bringing down of  $\text{CCl}_2$  incited heights of SGOT, SGPT, ALP, and bilirubin levels ( $p < 0.01$ ) [22].

### **CONCLUSION**

In this review article, we had examined that the applicable phytochemical, pharmacognostic, and pharmacological effect of *Bauhinia acuminata*.

The different phytochemical examination has been uncovered that flavonoids, glycosides, alkaloids, tannins, and terpenoids are available as dynamic natural constituents which are in charge of various pharmacological activity of *Bauhinia acuminata*. The present study assessed that *Bauhinia acuminata* have different bioactive constituent and go about as antinociceptive, antibacterial, antifungal, antidiabetic, energizer, membrane stabilizing, and antimicrobial, ameliorative effect in chronic arsenicosis, hepatoprotective / carbon tetrachloride induced toxicity, antidiarrheal, cancer activity.

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