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Review Article

A Review on *Holarrhena Pubescens*

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ABSTRACT

Throughout history, medicinal plants have been recognised for their ability to prevent disease and are highly valued globally for their abundance of therapeutic compounds. These plants have been used for millennia. Since ancient times, holarrhena antidysenterica, often referred to as kurci, kurchi, or kutaj, has been used. The stem bark, leaves, and seeds of *Holarrhena antidysenterica* (syn. *H. pubescens*), a member of the Apocynaceae family, are used medicinally in Ayurveda. Many phytochemicals have been extracted from the plant in recent years, and they have demonstrated conventional pharmacological properties such as analgesic, antibacterial, anti-diarrheal, anti-diabetic, anti-oxidant, anti-urolithic, and anti-inflammatory properties. Furthermore, current research has revealed the following activities: neuroprotective, acetylcholinesterase inhibitory, anti-amnesic, and angiotensin-converting enzyme inhibitory. The goal of this review is to shed light on potential therapeutic applications for a range of illnesses. The Apocynaceae family includes *Holarrhena pubescens* Wall. Ex G. Don, which has a number of traditional medicinal uses. Its beginning of time, medicinal plants have been utilised for the benefit of humanity. Numerous research have been conducted to confirm their effectiveness, which has resulted in the development of numerous medications that can save *Ethamabhataj*: In the Charak Samhita, Drudhabala elucidated the several varieties of kutaj and their distinctions. Root: All forms of Arsha (hemorrhoids) can benefit from the application of root bark, as per Acharya Sushruta. As to Acharya Sushruta, leaves can be utilized in any kind of prameha when they are prepared as a decoction. Seed: Seeds are often used in medicine and are referred to as indrayava. Both crushed form and decoction are extensively used for diarrhea.

INTRODUCTION

Human civilisations were unaware of the importance of medicinal plants as a source of life-saving drugs, despite the fact that their existence

has been acknowledged for aeons. After this, ancient medical texts including the Chinese Pen Tsao, the Egyptian Ebers Papyrus, the Rig Veda

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and Sushruta Samhita in Ayurveda, and Dioscoride? De Material Medica emerged.



Three “doshas,” or bodily systems, named kapha, pitta, and vatta, are central to the principles of Ayurveda, the prominent ancient medicinal system in India. The Unani and Siddha medicinal systems are also important in some regions of India. As per these systems, Herbal remedies are widely used in medical systems across the globe. Using plant material as indigenous knowledge or as a traditional health care system, plant-derived medicinal items have been used in modern therapeutic products. Globally, the usage of herbal medicines has expanded to address public health issues and discover new products with established safety. Certain medications are not monitored or tested, and customers are unaware of the potential toxicity of traditional medicinal plants. Extracts from HP stem bark exhibit antibacterial action. Studies have been conducted on the anti-diabetic, anti-hyperglycemic, and anti-hyperlipidemic properties of seed ethanol, methanol, and aqueous extracts of HP7. In rats charged with starch, the hydro-methanol extract from the seed of an HP plant was found to block alpha-glucosidase activity.⁸

Botanical Description: A flowering plant species belonging to the Apocynaceae family is called Holarrhena antidysenterica. It is indigenous to the Indian Subcontinent, primarily Maharashtra in southern India. It is roughly 30 to 40 feet long and tall. The leaves are lanceolate in shape, with a

pointed tip, and a simple, green, glabrous, opposite, somewhat sessile, rectangular shape. They are 6 to 12 inches in length and 1.5 to 5 inches in width. Bark: The bark of this plant is slightly grey in colour and not smooth. Corymbose cymes are inflorescences.

Flowers: hairy on the outside, lobes oblong and rounded, mouth hairless, white, scentless, bracts short, calyx lobes five, acute ciliate, corolla salver-shaped, tube as long as lobes. Carpels 2 in free style filiform, stigma thick, stamens 5 included.

Fruit: Two around 1.5-inch-long follicles.

Seed: 0.5 inch long, greyish in hue. Commonly referred to as indrayava seeds. Time of flowering and fruiting: February through June.

Agricultural: Climate: It originates in the 1300 m high peaks of the Himalayas and is found practically everywhere in India, with the exception of marshes. Its tiny plants are frequently seen in huge numbers in the forests of Dun and Saharanpur. In several places, cultivation is also practiced.

Season: Early spring brings a profusion of flower blooms. There are now no leaves on the tree.

Taxonomical Classification:

Kingdom: Plantae

Class: Magnoliopsida

Order: Gentianales;

Family: Apocynaceae (Apocyns, Dogbane)

Super class: Phytoplana Holarrhena Pubescens wall ex G is the **Species:** species of Holarrhena R in the genus.

Ethanobotanical uses of kutaj: In Charak Samhita Drudhabala explained the types of kutaj with their differences. the Charak Samhita, Drudhabala elucidated the several varieties of kutaj and their distinctions.

Root: All forms of Arsha (hemorrhoids) can benefit from the application of root bark, as per Acharya Sushruta. As to Acharya Sushruta,

Leaves: can be utilized in any kind of prameha when they are prepared as a decoction.

Seeds: are often used in medicine and are referred to as indrayava. Both crushed form and decoction are extensively used for diarrhea. In several skin conditions, indrayava is also utilized as a paste. Blood loss is a typical usage for ghee, which is mostly made from Indrayava. Indrayava paste is frequently applied to burnt skin conditions.

Flowers: According to Acharya Sushruta flowers can be used in prameha.

Bark: It is used in the form of decoction in hemorrhoids. For wound healing, bark is used in the for of paste.

The pharmacological activities: that have been reported include anti-bacterial, antidiabetic, antihyperlipidemic, cytotoxic, anti-plasmodial, and anti-diarrheal effects. These findings were obtained by in vivo studies.⁴⁴

Various Activities of H.pubescens:

Anti-Diarrheal Property:

H. pubescens, commonly referred to as Cowitch or Velvet bean, is an antidiarrheal plant. Rats who consume the ethanol extract from H. pubescens seeds have far less diarrhea. Alkaloids extracted from H. pubescens seeds have the ability to inhibit diarrhea caused by enteropathogenic Escherichia coli. The extract from H. pubescens seeds has been shown to include flavonoids and alkaloids through phytochemical research, which may account for its antidiarrheal properties. The methanol and

aqueous extracts of H. pubescens leaves are efficient against infections that cause diarrhea.¹⁷

Antidiabetic Property:

Diabetic Prevention The passage discusses how different medical systems may employ the plant H. pubescens to treat diabetes. It has been discovered that the plant's seeds and leaves exhibit antihyperglycemic and hypoglycemic effects in rats, indicating that the plant may have medicinal relevance for the treatment of diabetes in people.

It has also been shown that H. pubescens leaves can be used to treat diabetes. Rats with diabetes were successfully treated by giving them an ethanolic extract of the plant's leaves at a BW for 21 days in a row. While further studies are necessary to confirm the safety and efficacy of H. pubescens in the treatment of human diabetes,

Anti-Diarrheal:

Preventive H. pubescens alkaloids showed promise as an anti-diarrheal drug in a different study by reducing enteropathogenic Escherichia coli growth in vitro and castor oil-induced diarrhea in vivo ⁶⁶. Plants are thought to possess antidiarrheal qualities due to phytochemicals such as flavonoids, alkaloids, tannins, steroids, and saponins. The extract from H. pubescens seeds contains alkaloids and flavonoids, which could be the reason for its activity. It was discovered that H. pubescens leaf extracts, both aqueous and methanolic, were efficient against the diarrheal pathogens.

Diuretic Property:

Wistar rats' urine output was shown to be considerably increased by the aqueous seed extract of H. pubescens. There was also a notable increase in the excretion of K⁺ and Na⁺ ions. Additionally, it has been observed that the chloroform extract of H. pubescens improves urine production in a dose-dependent way. Additionally, it was discovered that the urine had increased levels of Na⁺ and K⁺, suggesting that an increase in electrolyte excretion is probably what causes the diuretic effect.



Analgesic and anti-inflammatory properties :

Analgesic and anti-inflammatory effects of *H. pubescens* extract have been demonstrated in animal models. A methanol extract of the plant's bark decreased levels of nitric oxide and malondialdehyde in rats with colitis-induced colitis, but increased levels of glutathione and superoxide dismutase. According to research, the efficiency of *H. pubescens* varies with dose; a 400 mg/kg dose was found to suppress rat paw oedema by 74%. The chloroform extract's strongest analgesic and CNS-depressant effects were observed at a dose of 200 mg/kg.

Anti Malarial Activity: Chloroform extracts of *H. pubescens* bark showed significant in vitro and in vivo anti-malarial action when compared to *Plasmodium falciparum* isolates and administered to Swiss mice infected with the parasites. Ethanol and methanol extracts had significant antiplasmodial activity against *Plasmodium falciparum*, according to Nondo. Additionally, the *H. pubescens* root fractions demonstrated remarkable efficacy against *P. falciparum* that was resistant to artemisinin and chloroquine. In a separate study, the steroidal alkaloid conessine which was extracted from *H. pubescens* bark showed anti-plasmodial action.¹⁰

Novel Formulations:

There is limited research on novel formulations using *Holarrhena pubescens*. Some of them given are as follows:

Topical gel formulation:

To study's objective was to develop a topical gel formulation that included an extract of *Holarrhena pubescens* for the treatment of skin infections. A wide range of microorganisms, including bacteria and fungi, can result in skin infections, a common problem. *Holarrhena pubescens* is a plant that has long been used by Ayurvedic practitioners to treat a wide range of ailments, including skin infections. Using a solvent extraction method, the extract was created from the bark of the *Holarrhena pubescens*

plant, and the concentration of bioactive components like tannins, flavonoids, and alkaloids was standardised. Triethanolamine was used to regulate the pH and a carbopol polymer was used as a gelling agent to generate the gel. The gel's antimicrobial activity was tested using the agar well diffusion method, and the findings showed that it had good antimicrobial activity against a range of bacteria, including *Escherichia coli* and *Staphylococcus aureus*. The bioactive ingredients included in the extract of the pharma innovation journal. The *Holarrhena pubescens* having including flavonoids such quercetin and kaempferol, tannins, and alkaloids like conessine and kurchine. The antibacterial effects of the gel are derived from flavonoids such as kaempferol. The physical properties of the gel, such as its pH, viscosity, and spreadability, were evaluated as well. The gel's spreadability and viscosity were both satisfactory, indicating that it is stable and easy to apply to the skin.⁴⁵

Practical Uses

It can be used both Internally as well as externally. They are given described below:

Kutaja herb is very useful for the treatment of dysentery caused due to amoeba. It also a The seeds of this plant promote conception. Along with this these are used for toning up vaginal tissue after delivery in women. It is appropriate remedy for the rheumatoid arthritis and also osteoarthritis. Kutaja is useful remedy for the treatment of bleeding piles by keeping a check on the secretions of mucus and blood. A good herbal remedy in case of colic. It is also good to be used for mal-absorption.

Adverse Drug Reactions:

Unfavorable Drug Responses It is generally accepted that using *Holarrhena pubescens* as a medicinal plant is safe. Like any pharmaceutical or herbal supplement, it may, however, have negative effects on certain people. These are a few of the side effects of using *Holarrhena pubescens* that have been documented.



Gastrointestinal disturbances: Diarrhea, vomiting, and nausea are examples of gastrointestinal disorders that *Holarrhena pubescens* may induce. These side effects are typically minor and self-limiting, but in certain situations, you might need to see a doctor.

Allergic reactions: *Holarrhena pubescens* may cause allergic reactions in certain people, which might include swelling, itching, and skin rashes. In extreme circumstances, an allergic reaction that might be fatal called anaphylaxis may result.

Hypoglycaemia:

Hypoglycaemia, or low blood sugar, may result from *Holarrhena pubescens*' potential to reduce blood sugar levels. When using *Holarrhena pubescens*, people with diabetes who are taking medication to decrease their blood sugar levels should use it carefully and under medical supervision.

Liver toxicity:

There have been reports of *Holarrhena pubescens* poisoning some people's livers. While uncommon, this reaction has the potential to be quite dangerous.⁵³

Conclusion:

Holarrhena pubescens, a plant with a long history of usage in traditional medicine, has been shown to possess various pharmacological characteristics. The plant's therapeutic properties stem from its phytochemicals, including alkaloids, glycosides, and flavonoids.

Kurchi is a herb having a variety of medicinal and pharmacological properties. Research indicates that it contains insecticidal, antibacterial, wound healing, antioxidant, cardioprotective, hypolipidemic, gastroprotective, anticancer, antimutagenic, and antinociceptive properties.

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