



A PHYTOPHARMACOLOGICAL REVIEW OF POTENTIAL DRUG KUTAKI (PICRORHIZA KURROA (Linn.))

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ABSTRACT

Ayurveda is one of the most ancient medical sciences of the world, which aims at promotion of health and treating the disease of an individual. In the last decades as suffering COVID situations, lot of interest has been generated in the medical world regarding Ayurveda and other contemporary medicines. Atharvaveda (around 1200 BC), Charak Samhita and Sushrut Samhita (1000–500 BC) are the main classics that give detailed descriptions of over 700 herbs. Ayurveda provides us the knowledge of overcoming the diseases. In *Bhavprakash Nighantu*, Acharya Bhavprakash has mentioned the herbs as *Picrorhiza kurroa* (Linn.) for its various activity. This potential drug has unique phytopharmacological properties.

KEY WORDS: *Picrorhiza kurroa*, perennial herb, phyto-constituents, Immunomodulatory activity, Anti-arthritic activity, Hypolipemic activity, Anti-inflammatory activity Hepato-protective, Anti-diabetic

INTRODUCTION

Ayurveda is one of the most ancient medical sciences of the world, which aims at promotion of health and treating the disease of an individual. In the last decades as suffering COVID situations, lot of interest has been generated in the medical world regarding Ayurveda and other contemporary medicines. Atharvaveda (around 1200 BC), Charak Samhita and Sushrut Samhita (1000–500 BC) are the main classics that give detailed descriptions of over 700 herbs¹ Ayurveda provides us the knowledge of overcoming the diseases. In *Bhavprakash Nighantu*, Acharya Bhavprakash has mentioned the herbs as *Picrorhiza kurroa* (Linn.)² for its various activity.

It is found in the Himalaya region from Kashmir to Sikkim at an elevation of 2700 to 4500 m & Nepal, found abundantly between 3500 to 4800 m³. It is found far away from the community and takes from hours to days to walk to its growing habitat.

Picrorhiza kurroa Family (Scrophulariaceae) is the known species. *Kutaki* is a small perennial herb. There are 132 constituents present in different parts of kutaki. Rhizome contains a glucoside called Picrorrhizin, a fairly large percentage of soluble bitter substance with an acid reaction⁴.

AIM

To review phytopharmacology of plant *Picrorhiza kurroa* (Linn)

OBJECTIVES

- To study the ayurvedic and modern texts of Botany, Pharmacognosy, Ayurvedic and other related texts.
- To prepare the through review as per obtained data about *Picrorhiza kurroa*

Taxonomy of *Picrorhiza kurroa* (Linn)

Kingdom	Plantae
Phylum	Tracheophytes
Division	Dicotyledonae
Class	Asterids
Order	Scrophulariales
Family	Scrophulariaceae
Genus	<i>Picrorhiza</i>
Species	<i>Picrorhiza kurroa</i>

Morphological Characteristics of *Picrorhiza kurroa* (Linn)³

- *Kutaki* is a small perennial herb. Stem is small, weak, creeping, erect at flowering, leafy & slightly hairy.
- The Rhizome: They are joint and zigzag, greyish-brown, cylindrical, irregularly curved with branching & rooting at the jointed nodes, 5 to 10cm long.
- The Leaves: 5 to 10 cm long, almost radical, sharply serrate, turning black on drying.
- The Flowers: very small, white or pale blue purple in dense terminal spikes. Bracts are oblong or lanceolate, equalling the calyx. sepals are lanceolate. Corolla units are five in number and have a cleft in the middle.
- The Fruit: It is two-celled spherical capsule.
- The Seeds: Seeds are many, white with an oblong curved raphae.

Phytochemical Analysis⁴

These secondary metabolites are diverse types of chemical groups responsible for specific therapeutic activity. There are 132 constituents present in different parts of kutaki. Following are the various chemical constituents present in rhizome of Kutaki (*Picrorhiza kurroa*) picrorhizine, Cathartic acid, Picroside I, Picroside II, Iridoids, Acetophenones, Cucurbitacins, Pikuroside, Phenol glycosides, Flavenoids, Sugars, Resins, Alkaloid, sterpenoids. Rhizome contains a glucoside called Picrorrhizin, a fairly large percentage of soluble bitter substance with an acid reaction. The drug also contains other substance such as glucose, wax, cathartic acid etc

Pharmacological activities of *Picrorhiza kurroa* (Linn) as per modern science

1.Immunomodulatory activity⁵

The effect of an ethanolic extract of each drug was studied on delayed type hypersensitivity, humoral responses to sheep red blood cells, skin allograft rejection, and phagocytic activity of the reticuloendothelial system in mice.

2.Anti-arthritic activity⁶

Open-label studies conducted in India show a preliminary benefit for persons with primarily rheumatoid arthritis.

3.Hypolipemic activity⁷



A hypolipemic activity of P.Kurroa was observed in a high fat diet feeding mouse. Liver weight, serum aspartate transferase (AST), Alanine transferase (ALT), low density lipoprotein (LDL), triglyceride and total cholesterol levels were significantly reduced by the treatment. On the contrary, serum HDL level seems not affected by P.Kurroa water extract.

4. Anti-inflammatory activity⁸

Apocynin concentration dependently inhibited the formation of thromboxane A₂, whereas the release of prostaglandins E₂ and F_{2α} was stimulated. Apocynin inhibited arachidonic acid induced aggregation of bovine platelets, possibly through inhibition of thromboxane formation. The rhizome of *Picrorhiza* is used to treat inflammatory diseases as a traditional medication.

5. Hepatoprotective activity⁹

Plant is a potent Immuno-stimulant of both cell mediated and hormonal immunity *Kurroa* is also useful in treatment of asthma. Isolated compounds from *P.Kurroa* have Apocynin inhibited arachidonic acid induced aggregation of bovine platelets, possibly through inhibition of thromboxane formation. Isolated compounds from *P.Kurroa* have also been shown to have hepatoprotective activity. Non-alcoholic fatty liver diseases (NAFLD) in rats was cured by giving standard hydro-alcoholic extract of *P.Kurroa*. It Reduced the lipid content of liver significantly at the dose of 400 mg/kg.

6. Antidiabetic activity¹⁰

Extract of *Picrorhiza* was found to lower blood glucose in laboratory animals. Chronic administration of the extract significantly reduced blood sugar in alloxan-induced diabetic rats for 10 days. The extract was also used to reduce the increased blood urea nitrogen and serum lipid peroxides in alloxan-induced diabetic animals and to inhibit the body weight reduction and leucopenia induced by alloxan administration.

In the streptozotocin induced diabetic rats, treated with a gavage of ethanol extraction of *Picrorhiza* herbal formulation. It reduced NADPH – oxidase dependent superoxide generation and decreased expression of malondialdehyde and advanced oxidation protein products in diabetic kidney. So, extraction of *Picrorhiza* improves diabetic nephropathy through inhibition of redox sensitive inflammation.

Referances

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