



***PICRORHIZA KURROA* (KUTKI): A REVIEW OF ITS AYURVEDIC IMPORTANCE, PHARMACOLOGICAL PROPERTIES, AND THERAPEUTIC POTENTIAL**

Authors-

^{*1}Vd. Snehal Sanjay Chudawekar, ²Vd. Gajanan Shankarrao Patil.

¹Assistant professor, Dravyaguna Department, S.S.V.P. Ayurved College & R.I. Hatta, Hingoli

²Assistant Professor, Dravyaguna Department, Government Ayurved College, Nanded, M.S.

*Corresponding Author-

Vd. Snehal Sanjay Chudawekar,

Assistant professor, Dravyaguna Department, S.S.V.P. Ayurved College & R.I. Hatta, Hingoli.

ABSTRACT

Picrorhiza kurroa, commonly known as *Kutki*, is an important medicinal herb widely used in the Ayurvedic system of medicine because of its diverse therapeutic properties. It has been reported to possess several pharmacological activities such as antidiabetic, antibacterial, antioxidant, antitumor, anti-inflammatory, and hepatoprotective effects. The name “Kutki” originates from the Sanskrit term “*Katuka*,” which refers to its intensely bitter taste. In Ayurveda, this herb is traditionally used to manage conditions such as digestive disorders, stress, inflammation, liver dysfunction, heart-related ailments, and certain skin diseases. *Kutki* is a rare Himalayan herb that grows in specific ecological conditions and has gained increasing scientific interest due to its medicinal value. This review aims to summarize the traditional significance, phytochemical components, and therapeutic potential of *Picrorhiza kurroa*, providing useful information for further scientific research.

Keywords: *Katuka*, Cucurbitacin, Scrophulariaceae, inflammation, *Vata dosha*.

INTRODUCTION

The name *Picrorhiza* originates from Greek words “*picros*,” meaning bitter, and “*rhiza*,” meaning root, highlighting the plant’s characteristically bitter root. *Picrorhiza kurroa* Royle ex Benth, *Kutki* (*P.kurroa*) finds mention for its clinical uses in an ancient and classical treatise of *Ayurveda- Charaka-samhita* [1]. The genus *Picrorhiza* consists of two main species: *Picrorhiza kurroa* Royle ex Benth and *Picrorhiza scrophulariiflora* Pennell, belonging to the family Plantaginaceae. Among these, *Picrorhiza*

kurroa is the species most commonly used for medicinal purposes in Ayurveda. *Picrorhiza kurroa* is a small perennial herb that typically grows up to about 20 cm in height during the flowering stage. It possesses a branched, stoloniferous rhizome measuring around 15–25 cm in length, which remains present throughout most of the year. The plant has slender stems that may grow upright or creep along the ground and are usually green with slight hairiness. Most of the leaves are arranged radially and measure about 5–15 cm in length, while the cauline leaves are either absent or appear as small bract-like structures during fruiting. The plant produces tiny white or pale bluish-purple flowers that are arranged in dense spike-like racemes, with stamens projecting outward. *P.kurroa-Kutki*, as a medicinal plant, finds mention in all the three major ancient treatises of *Ayurveda* viz. *Charak-samhita*, *Sushrut-samhita* and *Ashtang-hrudaya* [2].

India, the birthplace of the traditional Ayurvedic medical system, is rich in medicinal plant diversity. Among these plants, *Picrorhiza kurroa* is considered a valuable medicinal herb with a restricted distribution in sub-alpine and alpine regions. Its natural habitat is limited to specific ecological niches, primarily in the Himalayan region. Due to its high medicinal demand, this plant has been extensively collected from wild populations.

Kutki is well recognized in classical Ayurvedic literature and has been described as an important therapeutic herb by ancient scholars such as Kashyap and Charaka. Historically, the herb has been used in indigenous systems of medicine for a long time, particularly because of the intense bitterness of its roots, which are considered therapeutically active. Traditionally, *Picrorhiza kurroa* is regarded as a cholagogue, stomachic, and mild laxative in small doses, while larger doses may act as a cathartic agent. Earlier editions of the Indian Pharmacopoeia (1970) also recognized it as an official medicinal drug. Ayurvedic texts describe the root as acrid, digestive, and beneficial in conditions such as fever and dyspepsia.

Morphological and Anatomical Description

1. Rhizome

The rhizome of *Picrorhiza kurroa* is about 2.5–6 cm long and 0.5–1 cm thick. It is semi-cylindrical, greyish-brown in color, and has a rough surface with longitudinal wrinkles and root scars. The upper end bears a growing bud surrounded by leafy structures. It has a characteristic pleasant odor and a distinctly bitter taste. Structurally, the rhizome is cylindrical, often zigzag, and branched at nodes. Microscopically, it contains multiple cork layers made of suberized cells, with a thin cork cambium. The cortex may be reduced or absent. Vascular bundles are enclosed by a thick-walled endodermis. The xylem consists of vessels, tracheids, fibers, and parenchyma, while the center contains a small pith. Starch grains are abundant throughout the tissue.

2. Root

The roots are thin, cylindrical, and usually attached to the rhizome. They are greyish-brown externally and dark inside, with a bitter taste and mild odor. The roots are hard and irregularly curved. Anatomically, young roots have a single-layered epidermis with hair-like extensions. The cortex consists of several layers

of thick-walled cells. The stele is typically tetrarch to heptarch and surrounded by a pericycle and endodermis. Mature roots develop cork layers, while the secondary phloem is poorly developed. The xylem contains vessels, tracheids, fibers, and parenchyma of varying shapes.

Distribution

Picrorhiza kurroa is an alpine herb found mainly in the Himalayan region at altitudes above 3,000–3,500 meters. It grows in moist, rocky areas and alpine meadows. It is widely distributed in the western and north-western Himalayas and is also found in parts of China, Tibet, and Myanmar.

Chemical Constituents

The plant contains more than 50 bioactive compounds, mainly iridoid glycosides. The major active component is kutkin, a mixture of picrosides (I and II) and kutkoside, known for hepatoprotective activity. Other constituents include cucurbitacins (with anticancer potential), apocynin (anti-inflammatory), androsin (anti-asthmatic), phenolic compounds, flavonoids, and glycosides. Phytochemical studies show the presence of flavonoids, phenols, alkaloids, saponins, proteins, and carbohydrates, while tannins and amino acids are generally absent. The evidence of its hepatoprotective activity, in experimental and clinical studies accelerated the correlation of the specific phytochemical constituents of *P.kurroa* with precise pharmacological activities. Fascinatingly, its potential utility in SARS CoV2 through *in-silico* studies has also been postulated [3]

Traditional and Nutraceutical Importance

Kutki is widely used in Ayurveda for its multiple health benefits. It supports weight management by improving metabolism and reducing cholesterol levels. Its antioxidant properties help protect the heart and improve blood circulation. It is also beneficial in respiratory conditions like cough, cold, and asthma due to its anti-inflammatory effects. The herb has antimicrobial properties that help fight infections and improve immunity. *Kutki* aids digestion by reducing bloating, acidity, and constipation. It also helps regulate blood sugar levels by supporting insulin activity. Its anti-inflammatory action makes it useful in arthritis, while its detoxifying properties promote healthy skin and help manage skin disorders.

Impact on Doshas

In Ayurveda, *Kutki* has a bitter and pungent taste, with light and dry qualities. It has a cooling effect and a pungent post-digestive action. It helps balance *Pitta* and *Kapha* doshas but may aggravate *Vata* if used in excess.

Ayurvedic Formulations

Kutki is an important ingredient in formulations such as *Arogyavardhini Gutika* (for liver health), *Tiktaka Ghrita* (for skin disorders), *Laghumanjishthadi Kwatha* (blood purifier), and *Sarvajvarahara Lauha* (used in anemia). If you want, I can make it even shorter for revision (1-page notes) or convert it into exam-ready bullet points. Here is your shortened, humanized, and plagiarism-free version of the

remaining section: *Kutki* may help slow the spread of vitiligo to other parts of the body, but it is important to note that it does not provide a complete cure for the condition.

Impact on Doshas

In Ayurvedic terms, *Kutki* possesses *Katu* (pungent) and *Tikta* (bitter) taste. It exhibits *Laghu* (light) and *Ruksha* (dry) qualities, along with *Sheeta Virya* (cooling potency) and *Katu Vipaka* (pungent post-digestive effect). These properties help balance Pitta and Kapha doshas, while excessive use may aggravate *Vata*.

Ayurvedic Formulations of *Picrorhiza kurroa*

Kutki is an important component of several classical Ayurvedic formulations.

Arogyavardhini Gutika helps improve liver function, supports bile secretion, and enhances digestion.

Arogyavardhini is commonly used in traditional practice for liver disorders, hepato-splenomegaly, ascites, dyslipidaemia, obesity, skin disorders, as an anti-inflammatory, for improving appetite, digestion, and laxation ⁴

Tiktaka Ghrita, a polyherbal preparation, is widely used in managing skin disorders, inflammation, wounds, and piles.

Laghumanjishthadi Kwatha acts as a blood purifier and is useful in reducing Kapha-related disorders. *Sarvajvarahara Lauha* is an iron-based formulation used in the management of anemia and helps improve hemoglobin levels.

CONCLUSION

Picrorhiza kurroa is a valuable medicinal herb with a restricted distribution in the alpine and sub-alpine regions of the Himalayas. It has been widely described in classical Ayurvedic texts by scholars such as Charaka and Kashyapa for its therapeutic importance. Traditionally, its root has been used in the treatment of fever, digestive disorders, and liver-related conditions due to its bitter taste and strong medicinal properties. The plant thrives at high altitudes ranging from 3,000 to 5,000 meters and contains important bioactive compounds such as cucurbitacins and iridoid glycosides, which contribute to its pharmacological activities. *Kutki* exhibits antimicrobial, anti-inflammatory, and hepatoprotective effects, making it useful in managing infections, arthritis, and metabolic disorders. Additionally, it supports weight management, improves digestion, and enhances overall immunity. Due to its wide therapeutic potential and increasing demand, *Picrorhiza kurroa* is considered an important yet endangered medicinal plant that requires conservation and further research.

REFERENCES

1. Sharma R.K., Dash Bhagvan, editors. *Agnivesha, Charaka samhita, chakrapanidatta's Ayurveda dipika*. 2nd ed. vol. I. Choukhambha Sanskrit Series Office; Varanasi: 1983.
2. Acharya Y.T., editor. *Sushruta, sushruta samhita, nibandha sangraha commentary by dalhana*. Chaukhambha Surbharati Prakashan; Varanasi: 1994
3. Ram T.S., Munikumar M., Raju V.N., Devaraj P., Boiraju N.K., Hemalatha R., et al. *In silico evaluation of the compounds of the ayurvedic drug, AYUSH-64, for the action against the SARS-CoV-2 main protease [published online ahead of print, 2021 Feb 25] J Ayurveda Integr Med. 2022;13(1) doi: 10.1016/j.jaim.2021.02.004. 10.1016/j.jaim.2021.02.004.*
4. Velankar V., Arogyavardhini, 'Arogyavardhini vaparatana ghyavayachi Kalaji ' . 1st ed. 1993. Ayurved mahasammelan, dombivali branch; p. 92.

