

**THERAPEUTIC PROPERTIES OF DARUHARIDRA -BERBERIS ARISTATA AND ITS
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ABSTRACT

India is an emerging nation. India's population is rising dramatically every day. Health ignorance, increased hot and humid environment, low living standards, unhygienic conditions are causing various diseases. *Daruharidra*, a prominent herb also known as *Berberis aristata* that is employed in many different medical systems. The ancient Egyptians used it to foresee the plague. In the early Middle Ages, herbalists in Europe utilised this plant to cure ailments of the liver and gall bladder. The plant is used in traditional medicine to treat eye inflammation, menorrhagia, diarrhoea, skin conditions, and wound healing. The plant's fruit is a good source of vitamin C. Berberine, which is mostly found in the plant's roots, is its primary active component. The most significant preparation of this plant is "*Rashut*," which functions as a tonic and blood purifier and is also used to treat ophthalmic and ulcer problems. The plant is said to have a variety of pharmacological qualities, including antibacterial, anti-inflammatory, analgesic, antipyretic, hepatoprotective, immunomodulatory, and cardiotoxic action, according to reported clinical and experimental research.

KEYWORDS: *Daruharidra*, *Berberis aristata*, Hepatoprotective.**INTRODUCTION**

The liver has the responsibility of metabolising xenobiotics because it is the body's most significant digestive organ. Any disturbance of these processes causes liver damage or hepatotoxicity, which can be brought on by a variety of factors including an imbalance in the mitochondria, DNA damage and apoptosis in the hepatocytes, and an increase in the levels of liver enzymes in the serum.

Numerous medicinal plants, including flavonoids, phenols, alkaloids, carotenoids, coumarins, xanthines, essential oils, and monoterpenes, include substances having hepatoprotective properties.^[1]

Daruharidra (*Berberis aristata* DC) has been described by various Acharyas for kamala and various other disease.^[2] *Daruharidra* (*Berberis aristata* DC) has *tikta rasa*, *vipaka katu*, *ruksha guna*, *ushna virya* and *lekhana karma*^[3] which plays a major role in *bahupittakamala* (Hepatitis).^[4] Berberine present in *Daruharidra* is responsible for hepatoprotective activity. Other constituents present are berbamine, aromoline, palmatine oxyacanthine and oxyberberine are also present.^[5]

Commonly referred to as *Daruharidra*, *Berberis aristata* DC. is a well known medication that has been utilised internationally in a variety of medical systems. Native to the Himalayas, this plant can also be found in the Nilgiri Mountains at elevations between 2000 and 3500 metres. *Netra Roga*, *Pandu*, *Kamala*, *Kushtha*, *Mutrakruccha*, *Pratishyaya*, and *Prameha* are the most commonly used in Ayurveda. It possesses antioxidative, anti-inflammatory, anticancer, hepatoprotective, and immunomodulatory activities, according to clinical and experimental investigations. According to Ayurveda, *Daruharidra* (*Berberis aristata* DC) is a naturally occurring source of berberine, which lowers liver hepatocyte inflammation. It possesses cholegogue, astringent, hepato-stimulant, and hepato-protective qualities, among others.

Aims and Objectives

To review the Therapeutic properties of *Daruharidra* and its role in Hepatoprotective efficacy.

MATERIALS AND METHODS

Review of *Ayurvedic* Literature and their corresponding commentaries have undergone in-depth. Peer-reviewed medical publications and textbooks of contemporary

medical sciences have also been cited as sources for this topic.

Plant description

A vertically spinous, glabrous herb of the Berberidaceae family is called *Berberis aristata*. The plant is between two and three metres tall. It has a rough, woody exterior and a yellowish to brown interior. The thorns are 1.5 cm long, three-branched modified leaves that are simple to remove by hand in longitudinal strips.^[6]

The 5-8 spiny, simple, lanceolate, leathery, toothed, sessile, verticillate leaves are present in clusters and measure 4.9 cm in length and 1.8 cm in breadth. With reticulate pinnate venation, the leaves are deep green on the dorsal side and light green on the ventral surface.^[7]

With 11 to 16 flowers per raceme, the yellow, complete, perigynous, hermaphrodite, actinomorphic flowers have an average diameter of 12.5 mm when completely opened. The calyx has six sepals, three little and three large, each measuring 4 to 5 mm in length. Yellow, six-petalled, polypetalous corolla. The female reproductive structure (gynoecium), which is 4-5 mm long and is made up of a large stigma and a short style, is present in polyandrous androecium along with six stamens that are 5- 6 mm long. Midway through March, the flowers begin to bloom, and they continue until April.^[8]

Taxonomical classification of *B. aristata*^[14]

Taxonomical rank	Taxon
Kingdom	Plantae
Division	Phanerogamea
Sub-division	Angiospermea
Class	Dicotyledonae
Sub-class	Polypetalae
Group	Thalamiflorae
Order	Ranunculales
Family	Berberidaceae
Genus	Berberis
Species	aristata
Common name	Daruharidra

Daruharidra in ayurveda

Ayurveda is a traditional medical system that dates back about 5000 years. The most important plant in *Ayurveda* is the *B. aristata* plant. For its many medicinal characteristics to treat a variety of ailments, this herb is referenced in ancient writings of *Ayurveda*, *Charaka*, and *Susruta*.^[15] It has been utilised in the Ayurvedic medical system for centuries. The herb *Berberis aristata* is used in *Ayurveda* to treat conditions like dysentery, wound healing, skin conditions, inflammation, diarrhea, jaundice, menorrhagia, and eye conditions.^[16]

Formulation

Rashut, one of the most significant *Ayurvedic* formulations of this plant, is used to treat ophthalmic and ulcer problems as well as acting as a laxative, tonic, and blood purifier.^[17,18] *Darvyadi kvatha*, *Darvyadi leha*,

The fruit is ovoid to elliptical, bright crimson, covered in flowers, delicious, acidic, and succulent. The fruit weighs about 227 grammes and measures about 7 mm in length and 4 mm in breadth.^[9]

Habitat

In addition to being widely dispersed in India, Sri Lanka, Bhutan, and Asia, the plant *Berberis aristata* is a native of Nepal^[10] It is primarily found in India's sub-Himalayan region at an altitude of 1000-3000 metres, in the Nilgiri hills in the south at an altitude of 1000-2400 metres, in Jammu and Kashmir, Himachal Pradesh, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, Uttrakhand, Sikkim, and has grown up to an altitude range between 2000 and 3500 metres.^[11,12]

Raspanchak

Rasa - Katu, Tikta

Vipak - Katu

Veerya - Ushna

Guna - Ushna, Ruksha

Modern review of *daruharidra*^[13]

Latin name: *Berberis aristata* Dc.

Berberis: Belonging to the Berberis family

Aristata: Furnished with an elongated projecting bristle, in connection with the costa (rib).

Berberidaceae: From Berberys (Arabic name).

Darvyadi taila, *Rasanjana*, *Dasanga lepa*, *Rasanjana*, *Khadiradi Vati*, *Mahamanjsthadi Kashayam*, and *Mahayograj Guggulu* are some of the most popular formulations of this plant.^[19]

Phytochemicals in *daruharidra*

Almost all of the *Berberis aristata's* parts include different chemical components. Alkaloids make up the majority of the chemical components in the *B. aristata* plant. One of the most significant alkaloid elements found in the *B. aristata* plant is berberine. The protoberberine alkaloids Karachine, dihyrokarachine, tetrahydropalmatine, tetrahydroberberine, epiberberine palmatine, palmatine dehydrocaroline, jatrorhizine, columbamine, and palmatine chloride are all found in the root bark of the *B. aristata* plant.^[20] Aromoline,

oxyberberine, berbamine, oxyacanthine, and berberine chloride are additional extracted alkaloids.^[21, 22]

The bark of the plant was also used to extract alkaloids such pseudopalmatine chloride, pseudoberberine chloride, taxilamine, pakistanine, and 1-O-methylpakistanine.^[23, 24] Quercetin, meratin, and rutin are polyphenolic flavonoids found in the flowers of the *B. aristata* plant.^[25] E-caffeic acid and chlorogenic acid are two more acids.^[26] The ethanolic extract of heartwood also contains the aliphatic hydrocarbon n- docasane. The heavy metals found in the plant's rhizome include cadmium, lead, chromium, zinc, iron, and manganese.

Karma (Actions) of *daruharidra*^[27]

Shothahara: It is used to treat oedema.

Vedana sthapan: It acts as analgesic by reducing pain.

Vrana shodhana: It helps in wound healing.

Deepan: It acts as Appetizer.

Pitta sarak: It maintains Metabolism and Used to treat liver, jaundice, digestive and pancreatic disorders.

Grahi: It helps to cure diarrhea and dysentery problems.

Rakta shodhaka: It acts as blood purifier.

Garbhashayashothahara: It improves uterine health and used to treat pelvic inflammatory diseases.

Stravahara: It treats abnormal discharge problem.

Research work on therapeutic effects of *daruharidra*

Inhibitory effects on inflammation

In rats with carrageenan-induced paw edoema, aqueous preparations of the roots of *B. Aristata* at doses of 500–1000 mg/kg significantly reduced inflammation when compared to that caused by 10 mg of diclofenac sodium.^[28]

B. aristata and *C. fenestratum* methanolic and aqueous extracts both shown comparable anti-inflammatory efficacy in a rat model of carrageenan-induced raw paw edoema.^[29]

Antimicrobial activity

The trachoma bacteria were resistant to the effects of the berberine alkaloid from *B. aristata*.^[30]

Four *Berberis* species' hydro alcoholic extracts shown antimicrobial efficacy against eight fungal and eleven bacterial strains.^[31]

Antidiarrheal

Research was done in vivo and in vitro to verify *B. aristata* plant's anti-diarrheal properties.^[32] According to published investigations, the enterotoxin secretory response of *Vibrio cholera* and *E. coli* in rabbit ligated intestinal loop model and neonatal mouse assay was inhibited by berberine ingredient derived from the roots and bark of *B. aristata* plant.^[33] Additionally, cholera toxin-induced diarrhoea is inhibited by a crude dry preparation of the *B. aristata* plant.^[34, 35] Anti-diabetic: Several laboratory tests found that *B. aristata*'s ethanolic extract shown anti-diabetic action when tested on rats

that had been induced with diabetes using alloxan.^[36] The *B. aristata* plant's alcohol-based stem extract has anti-hyperglycemic properties.^[37] The plant's ability to inhibit DPP-IV suggested that it might be an anti-diabetic drug.^[38]

Antioxidant

The antioxidant activity of the *B. aristata* plant was investigated using its aqueous ethanolic extract. With safety precautions, the investigation was carried out on diabetic rats. It was discovered that the plant's root extract decreased oxidative stress.^[39] When the plant's aqueous and methanolic extract was tested against CCl₄-induced liver damage, a substantial effect was also discovered.^[40]

Hepatoprotective activity

To assess the plant's hepatoprotective potential, an immunomodulation experiment was carried out on golden hamsters. The rate of infection in hepatic amoebiasis was found to be reduced by the formulation incorporating *B. aristata*.^[41] The plant's aqueous methanolic extract has hepatoprotective properties.^[42] Other investigations have shown that the berberine component of the plant has hepatoprotective activity when tested on rats. Hepatobiliary excretion and liver metabolism are regulated by cytochrome p-glycoprotein and P-450.^[43]

DISCUSSION

Some medications, such as *Kutaki (Picrorhiza kurroa Royle ex Benth)*, *Kumari (Aloe vera Tourn. ex Linn.)*, and others, are described in *Ayurveda* as hepatoprotective. One medication that exhibits hepatoprotective action is *Daruharidra*.

Daruharidra - Rasa: Tikta, Katu, Guṇa: Laghu, Rukṣa, Virya: Ushna Vipaka: Katu and is rich in content of Berberine. It reduces the symptoms of *kapha* and *pitta doshas*. Hepatitis, anorexia, and dysentery can all be treated with the help of the qualities cholegogue, hepatostimulant, and astringent. Because of *Tikta rasa* and *Daruharidra's* berberine, it lessens the excretion of excessive bile pigment production. As a result, it lowers blood serum enzyme levels and liver tissue inflammation. Due to its *Tikta rasa*, *Daruharidra* is *Rakta shodaka, tvaka, mansa prasadaka, and yakruta uttejaka*.

CONCLUSION

Daruharidra definitely has a positive effect in reducing signs and symptoms of diseases. Since the Vedic, Upanishad, and Samhita periods, *Daruharidra* has been utilised as medicine. *Daruharidra* exhibits *Pramehaghna, Kushthaghna, Netrya* and numerous other therapeutic effects since it possesses the qualities of *Katu, Tikta, Kashay Rasa, Katu Vipaka, Ushana Veerya, and Laghu and Ruksha*. It shows antioxidative, anti-inflammatory, anti-cancer, hepatoprotective, and immunomodulatory activities, according to clinical and

experimental investigations.

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