

# Review on Ayurvedic and Pharmacological Properties of Saireyaka *Barleria Prionitis* Linn

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## Abstract:

**Background:** Saireyaka (*Barleria prionitis* Linn.) of is one of the most useful plant in Ayurveda. Many pharmacological studies have been conducted to investigate the properties of Saireyaka (*Barleria prionitis* Linn.) in an attempt to authenticate its use as a multi-purpose medicinal agent. The objective of this paper is to review the literature regarding Saireyaka (*Barleria prionitis* Linn.) Specifically, the literature was reviewed for articles pertaining to chemical properties and therapeutic benefits. This review is in a narrative format and consists of all publications relevant to Saireyaka (*Barleria prionitis* Linn.) that were identified by the authors through a Google scholar search and books from Central library and library of Dravyaguna Vigyan department of Sai Ayurved College, Hospital and Research Centre Sasure-Vairag-Solapur. Result shows that Saireyaka (*Barleria prionitis* Linn.) possesses antimicrobial, antiviral, hepatoprotective, antioxidant, anticancer, anti-inflammatory, thrombolytic and diuretic properties. The mechanisms of action for these properties are not fully understood. Preliminary studies have found various constituents of Saireyaka (*Barleria prionitis* Linn.) exhibiting a variety of therapeutic effects. These results are very encouraging and indicate this herb should be studied more extensively to confirm these results and reveal other potential therapeutic effects. Saireyaka (*Barleria prionitis* Linn.) is an Ayurvedic medicinal plant which is mentioned in Ayurvedic classical books. It is one of the plants which according to Ayurveda this plant is having Ras-Katu, Veerya-Ushna, Vipaka-Katu, Vaatahar and Kaphahar and Sheet. Many pharmacological studies have been conducted to investigate the properties of Saireyaka (*Barleria prionitis* Linn.) in an attempt to authenticate its use as a multi-purpose medicinal agent. The main aim of this article is to collect and analyze the scientific information related to traditional uses, bioactive chemical constituents and pharmacological activities.

**Methods:** Scientific information on Saireyaka (*Barleria prionitis* Linn.) was retrieved from the online bibliographic databases (e.g. MEDLINE/PubMed, SciFinder, Web of Science, Google Scholar and Scopus) and books from central library as well as library of Dravyaguna department of Sai Ayurved College, Hospital and Research Centre Sasure-Vairag-Solapur.

**Results:** Different plant parts of Saireyaka (*Barleria prionitis* Linn.) were reported to be used for the treatment of natural hair color, cough, skin diseases, and antidote in various poisonous bites such as rat bite. Various extracts were evaluated for their antibacterial, anti-inflammatory, antimicrobial, antidiabetic, hypolipidemic, antioxidant, thrombolytic property, hepatoprotective activity.

**Conclusion:** The mechanisms of action Saireyaka (*Barleria prionitis* Linn.) for these properties are not fully understood. Preliminary studies have found various constituents of exhibiting a variety of

therapeutic effects. These results are very encouraging and indicate this herb should be studied more extensively to confirm these results and reveal other potential therapeutic effects.

**Keywords:** Saireyaka (*Barleria prionitis* Linn.); Acanthaceae; Ayurvedic uses; alkaloids; pharmacological activity

## INTRODUCTION

Medicinal plants are used worldwide in management healthcare problems since the time immemorial. Ayurveda in one of the greatest science which has been working for thousands of year to serve mankind. The plants described in this scripture do the same deeds that they doing today. Global demands of Ayurvedic medicines are increasing day by day because of their safety major and low cost. Saireyaka (*Barleria prionitis* Linn.) a member of Acanthaceae family which known as Koranti in Marathi, Katasareeya in Hindi and Yellow nail dye plant in English. Saireyaka (*Barleria prionitis* Linn.) a perennial, acanthaceous, barbed, bushy medicinal plant, including in Barleria genus containing 300 species is famous for its medicinal value from ancient time.<sup>1</sup> Extensively found in India, it is distributed widely in throughout Asia including Malaysia, Pakistan, Philippines, Sri Lanka, Bangladesh, Yemen and tropical Africa.<sup>2-3</sup> The whole plant (Panchang), root and leaves are used as a medicine in Ayurveda. The Ayurvedic literature has shown its uses as Balya (health tonic) Shoth-har (anti-inflammatory), Jwar-har (anti-pyretic) Adhman-nashak (Anti-flatulonce) Shwaasahara (anti-asthmatic), Kandunaashak (Anti-pruritic) Kusth-naashak (useful in skin diseases). Glycosides like verbacocide, barlerinoside, saponins, steroids, tanins, pottassium salts, phytochemicals like balarenone, pipataline, lupeol, prioniside A, prioniside B, prioniside C balarenone, flavonoids, alkaloids found in the various parts of Saireyaka (*Barleria prionitis* Linn.). antibacterial, anti-inflammatory, antimicrobial, antidiabetic, hypolipidimic, antioxidant, thrombolytic property, hepatoprotective activity. Many pharmacological studies have been conducted to investigate the properties Saireyaka (*Barleria prionitis* Linn.) of in an attempt to authenticate its use as a multi-purpose medicinal agent. The purpose of this paper is to review the literature regarding Saireyaka (*Barleria prionitis* Linn.) and report on clinically relevant studies, in an attempt to establish a scientific basis for the therapeutic use of Saireyaka (*Barleria prionitis* Linn.) This literature review was limited to published articles and books in the English language. Books from central library and library of Dravyaguna Vigyan department Sai Ayurved College-Hospital and Research Centre Sasure-Vairag-Solapur.

## AYURVEDIC REVIEW

In Ayurveda there are four types of Saireyaka described i.e. Shwet, Pit, Rakt, and Nil which are based on the color of the flowers. These four types are B.cristata (Linn), B. prionitis(Linn), B.cristata(Linn) and B.strignosa (Linn) respectively. According to Ayurveda all the species having same Gunkarm (medicinal properties) so can be use anyone which is available.

Rasapnchaka of Saireyaka is as below

Ras(taste)	-Tikt(bitter), Madhur (sweet) and Kashay(astringent)
Gun(qualities)	-Laghu(light to digest), Ushna (Hot)
Vipak(metabolism)	-Katu (undergoes pungent taste after digestion)
Veerya (potency)	-Sheet ( cold)
Karm	-Vaata-Kaphaghna <sup>4</sup>

Saireyaka is Kaphnissarak(Expectorant) Swedjanaan (produces sweating),Shoth-har (anti-inflammatory) Vran-ropan( wound healer) Kesharanjan ( for hair color).<sup>1</sup> Saireyaka is the plant which is been used as a medicine from ancient time. In Vagbhata, Chakradatta, Shodhala, Bhavprakash, Rajanighantu, Saireyaka mentioned for its medicinal values. According to Kaiyedava Nighantu Saireyak is used as a Keshranjan, Kustha,Kandu,Visha. According to Dhanvantari Nighantu it is useful as a Balya,Vrisha, According to Vagbhat Saireyak is useful in Rat bite when it's root is given with honey.According to Chakradatta its leaf extract useful in Sidhmakustha, as well as its root are useful in toothache. According to Shodhal Saireyak root is useful for Garbhavridhhi. According to Bhavprakash it useful in Vaat-rakt, Kandu and Vishanaashak.<sup>5</sup>

### **BOTANICAL DESCRIPTION<sup>6</sup>**

A shrub 0.6-1.5 m high, much-branched, usually prickly; bark whitish, stem and branches terete or obsoletely 4-gonous, glabrous. Leaves 9-18 by 2.5-5.7 cm., elliptic, acuminate, bristle tipped, entire, lineolate, glabrous above, glabrous or more or less pubescent (especially the young leaves) beneath, base tapering into petiole; main nerves about 5 pairs; petioles 0.2 cm long, becoming shorter upwards, usually with 3 (sometimes 2 or 4) divaricate acicular spines in the axils. Flowers sessile, often solitary in the lower axils, becoming spicate above; bracts foliaceous, 16 by 4-5 mm., oblong or oblong-lanceolate, acute, bristle-tipped, nearly glabrous; bracteoles 1.3 cm., long narrowly linear-subacute (almost spinous), bristle-tipped. Calyx divided almost to the base; one of two outer sepals rather more than 1.3 cm. long, the opposite sepal rather less than 1.3 cm. long, 3-4 mm. broad, both oblong-lanceolate with long as the shorter of the outer ones, linear-lanceolate, with long mucro, the two 2 inner sepals 1.5 mm. wide and as long as the shorter of the outer ones, linear-lanceolate, mucronate. Corolla 3.2-4.5 cm. long, yellow, slightly pubescent outside, somewhat 2-tipped; upper lip 2 cm. long or more, deeply 4-lobed, the lobes oblong-ovate, rounded; lower lip oblong-ovate; rounded; entire; tube 1.9-2.2 cm. long. Stamens 2 fertile and 2 staminodes; filaments of the fertile stamens exerted beyond the corolla-tube, those of the staminoides very short. Capsules 2-2.5 cm. long, ovoid, with a long tapering solid beak, 2 seeded. Seeds 8 mm. diameter compressed, clothed with appressed hairs.

### **VERNACULAR NAMES<sup>5</sup>**

Sanskrit-Saireyaka, Kurantak, Sahachar, Katararika

Hindi- Katararaya

Marathi-Koranti

Gujarati-Kantashelio

Telugu-Gobbi

Bangali-Kantajati

Kannada-Gorantedai

Malayalam- Chemmuli

Tamil- Kodippachalai, Kattukkanna

### **TRDATIONAL USES**

In Konkan, the dried bark is given in whooping cough, and act as expectorant. The juice of the leaf is used in catarrhal affection of children, accompanied with fever and much viscid phlegm. The ashes of the burnt plant, mixed with conjee and water are used in dropsy and anasarca and also in cough. The

juice of leaves is applied to the feet in the rainy season to prevent cracking. A tooth paste made of the astringent leaves and common salt is used to strengthen the gums and in tooth-ache due to caries. The Mundas use a decoction of the whole plant in dropsy to wash the body with. The whole plant and especially the root is much used as a diuretic and tonic medicine in Ceylon.<sup>6</sup> In case of fever, decoction of leaf extract with honey is given for 7 days<sup>7</sup>. In leucoderma, its ash also applied with butter<sup>8</sup>. Traditional physicians give advice to swallow (chew) it for mouth ulcers management<sup>9</sup>. Oil extract of the plant is recommended for arresting greying of hair according to the ayurvedic pharmacopoeia of India<sup>10</sup>. Paste form of root is directly applied in boils and glandular swellings whereas paste with goat milk is given in rheumatic fever<sup>8,11</sup>.

### TAXONOMIC CLASSIFICATION<sup>12</sup>

Domain : Eukaryote  
Kingdom : Plantae  
Phylum : Spermatophyte  
Subphylum : Angiospermae  
Class : Dicotyledonae  
Order : Scrophulariales  
Family : Acanthaceae  
Genus : *Barleria*  
Species : *prionitis*

### PHYTOCHEMISTRY

Many phytochemicals such as alkaloid, flavonoids, saponins, tannin, steroid, terpenoids, sterol (stigmasterol), phenolic compound and essential oil from its leaf by different qualitative tests.<sup>13-16</sup> are isolated . It's arial parts contains a large quantities of glycosides (6-o-trans-p-coumaroyl-8-o-acetylshanzhiside methyl ester, barlerinoside, shanzhiside methyl ester, 6-o-trans-p-coumaroyl- 8-o-acetylshanzhiside methyl ester, barlerin, acetylbarlerin, 7-methoxydiderroside, and lupulinoside), terpenoid (lupeol), pipataline, balarenone and 13,14-seco-stigmasta-5,14- diene-3-ol identified by NMR.<sup>17-20</sup> Large amount of secondary metabolites such as glycosides, saponins, flavonoids, phenolic compounds, tannins, alkaloids, phytosterols, polyphenol and steroids are present in whole plant detected by different phytochemical tests.<sup>21-23</sup> Flowers contains significant phytochemicals including flavonoid, glycoside and neohesperidoside. New compounds such as hydroxy-2, 7-dimethyl-3, 6-dimethoxy anthraquinone, 1,3,6,8-tetra methoxy-2,7- dimethyl anthraquinone and 7-rhamnosylglucoside are isolated from *Barleria prionitis*.<sup>24,25</sup>

### PHARMACOLOGY

#### a. Ant-diabetic Activity

Alcoholic extract of leaf (200 mg/kg) increased insulin (130%) and liver glycogen (96.68%) and decreased glycosylated hemoglobin (22%) in alloxan-induced diabetic rats. Alcoholic extract of root at same dose increased insulin (30%) and liver glycogen (46.40%) whereas decreased glycosylated hemoglobin (11%) in same rat model.<sup>26-28</sup> Alcoholic, aqueous extracts of leaf (200 mg/kg) and chlorpropamide (100 mg/kg) reduced blood glucose level as  $82.39 \pm 0.95$  and  $92.52 \pm 2.88$  and  $73.68 \pm 1.83$  mg/100 ml after 7 days treatment where initial values were  $299.72 \pm 3.97$ ,  $233.59 \pm 3.49$  and  $274.93 \pm 6.7$

mg / 100 ml in alloxan induced diabetic rat model. Aqueous and alcoholic extracts of root reduced as  $94.56 \pm 2.04$  and  $74.12 \pm 1.13$  mg/100 ml after 7 days treatment where initial values were  $240.59 \pm 1.62$  and  $247.68 \pm 4.83$  mg/100 ml in same rat model.<sup>29</sup>

#### **b. Hepato-Protective activity:**

Shamin et al studied about the ethanol and water extract of aerial parts of *Barleria cristata* Linn. The study has been investigated for hepato-protective activity in acute and chronic animal test models. Silymarin was used as reference substance. The extract showed a significant hepatoprotection against Paracetamol, Galactosamine and carbon tetrachloride induced hepatotoxicity. This was a safety evaluation study as no signs of mortality and abnormality observed for 15 days after single dose. Oral was found to be 3000 mg/kg whereas intraperitoneal LD50 was found to be 2530 mg/kg. This study revealed that the Hepato protective potential of *Barleria cristata* as revealed maturity of the Hepatic Parameter in experimental liver damage in Rodents.<sup>30</sup>

#### **c. Wound-healing activity:**

The ointment obtained from crude extract of *Barleria prionitis* significantly stimulated wound contraction, decreased the epithelisation period along with a decreased scar area, when compared to control group. Soframycin was used as a standard drug and the study was done for upto 16 days.<sup>31</sup>

#### **d. Anti-infertility activity**

The anti-infertility activity of *B. prionitis* root was reported .oral administration of methanolic root extract 100 mg/rat/day reduced the spermatogenesis in male albino rats. It was observed that the root extract decreased the production of round spermatids, sperm motility, spermatogonia.<sup>32</sup>

#### **e. Antibacterial activity**

The antibacterial activity was investigated by Sulthana using the leaf extract of *Barleria cristata*. This study demonstrated that aqueous and methanolic extract of *Barleria prionitis* was active against gram negative *E. coli* and Gram Positive *Streptococcus*. The values of MIC (Minimum inhibitory concentration) indicates that very small amount of the extracts was required to inhibit the growth of bacteria, thus proving the potent activity of *Barleria cristata* against bacteria<sup>33</sup>.

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