

A Review About *Barleria Prionitis*: A Rarely Known Herb with Potential Medicinal Properties

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Abstract:

There are thousands of species which are known for their potential medicinal properties while many of them are still need to be discovered as a potential drug targets and their active drug molecules. *B. prionitis* is one of the rarely known shrub which has wonderful medicinal properties whether its leaves, flowers, stem and whole plant. It is native to tropical East Africa and tropical and temperate Asia. The whole plant leaves, and roots are used for a variety of purposes in traditional Indian medicine. For example, the leaves are used to promote healing of wounds and to relieve joint pains and toothache. Because of its antiseptic properties, extracts of the plant are incorporated into herbal cosmetics and hair products to promote skin and scalp health. Preliminary phytochemical analysis of hydro-methanolic extract of *B. prionitis* whole plant indicated the presence of glycosides, saponins, flavonoids, steroids and tannins. The antidiabetic activity of alcoholic extract of leaf and root of *B. prionitis* was evaluated by using alloxan monohydrate. *B. prionitis* leaves showed significant decrease in blood glucose level, glycosylated haemoglobin and significant increase in serum insulin and liver glycogen level. *B. prionitis* root showed moderate but non-significant anti-diabetic activity in experimental animals.

Key words: *Barleria Prionitis* . Drug, phytochemistry, traditional medicine

Introduction:

From the time immortal plants always has been used as food and medicines. There are thousands of species which are known for their potential medicinal properties while many of them are still need to be discovered as a potential drug targets and their active drug molecules. India is not only known for its broad diverse culture and tradition but also known for its broad diversity of plant species because of diversified landscaping. During the last decade, use of traditional medicine has expanded globally and gained popularity. Because of awareness of deleterious effects of modern synthetic drugs the plant based drugs are getting

much attention for use in herbal medicines, antioxidants and cosmetics. Natural products have a significant role in pharmaceutical industry as potential drug sources and bio active compounds [1]. *B. prionitis* is one of the rarely known shrub which has wonderful medicinal properties whether its leaves, flowers, stem and whole plant. It is native to tropical East Africa and tropical and temperate Asia [2]. It is often introduced as an ornamental in tropical and subtropical regions of the world and can now be found naturalized elsewhere It is broadly found in Tropical Asia include, India Pakistan, Myanmar, China, Philippines and Srilanka. In India it is commonly found in Madhya Pradesh, Rajasthan, Tamil Nadu, Maharashtra, Orissa, Assam, Andaman Nicobar, Gujarat states [3].



In English it is commonly known as : Barleria, porcupine-flower, Common yellow nail dye, Thorn nails dye, Yellow Hedge Barleria (Barleriaacanthoides is known as Vajradanti, Spiny White barleria; Barleriacristata L. is known as Jhinti, Kurabaka, Sahachara, Sahacharah, Crested purple nail dye, Philippine violet), **German:** Stachelschweinblume, **Unani:** Katsaraiya, Piyabaasa, **Urdu:** PilaBansa, PiyaBansa **Hindi:** झिण्टी jhinti, परुष parush, पीला पियाबांसा pilapiyabansa, पीली कटसैरैया pilikatsaraiya, वज्रदंती vajradanti, **Bengali:** kantajhinti, **Kannada:** haladigorate, kurantaka, madarangigida, mullugoranta, **Konkani:** कोरांटी koranti, **Malayalam:** chemmulli, Manjakanakambaram, manakkanakambaram **Sanskrit:** आर्तगलः artagalaha, बाण bana, dasikurantakah, झिण्टी jhinti, ककुभ kakubha, किङ्किरातः kinkiratah,

कुरण्टकः kurantakah, कुरवकः kuravakah, महासह mahasaha, पीतसैरीयकः pitasairiyakah, सहचरः saharah, उद्यानपाकी udyanapaki, वज्रदन्ती vajradanti.

Scientific classification:

Kingdom	-	Plantae
Subkingdom	-	Tracheobionta
Division	-	Magnoliophyta
Class	-	Magnoliopsida
Subclass	-	Asteridae
Order	-	Scrophulariales
Family	-	Acanthaceae
Genus	-	<i>Barleria Species - Prionitis.</i>
Botanical name	-	<i>Barleriapronitis</i>
Family	-	<i>Acanthaceae</i> (Acanthus family)
Synonyms	-	Barleriaappressa, Barleriacoriacea, Barleriaspicata

BarleriaPrionitis is an erect, prickly shrub, usually single-stemmed, growing to about 1.5 m tall. Spines are about 1.2 cm long. Leaves are up to 5-9 x 2.5-4 cm, elliptic, pointed, with a fine point, base wedge-shaped, sparsely puberulus, fringed with hairs on the margins, gland dotted beneath, leaf-stalk up to 2 cm. Orange-yellow flowers are borne in cymes in leaf-axils; bracts 2, 1.5 cm, oblong with a fine point at the tip. Outer sepals are 1.3 x 0.4 cm, inner 1.1 x 0.2 cm, fine-tipped, hairy. Flower tube is 2.5 cm, petals 2 cm obovate, filaments 1.3 cm, staminodes 2, remaining at the base of the flower tube. Ovary is 2.5 mm, style 2.5 cm.[4]

In South Africa, *B. prionitis* is pollinated by insects and attracts various species of butterflies [4]. In Puerto Rico it flowers from September to December and fruits are produced from January to April [26]. In China, it has been recorded flowering from October to December and fruiting from December to February.

B. prionitis grows in a wide variety of soils, but it grows best in well-drained sandy soils. Within its naturalized range, for example in Puerto Rico, it grows in areas receiving from about 750-900 mm of mean annual precipitation [3]. *B. prionitis* is moderately intolerant of shade, growing in both full sunlight and under light forest canopies [7].

Medicinal Uses:

Porcupine Flower has numerous medicinal properties including treating fever, respiratory diseases, toothache, joint pains and a variety of other ailments; and it has several cosmetic uses. A mouthwash made from root tissue is used to relieve toothache and treat bleeding gums. The whole plant leaves, and roots are used for a variety of purposes in traditional Indian medicine. For example, the leaves are used to promote healing of wounds and to relieve joint pains and toothache. Because of its antiseptic properties, extracts of the plant are incorporated into herbal cosmetics and hair products to promote skin and scalp health. It is used in Indonesia as a component in traditional medicines. [24], Parts of the plant are bitter, astringent in taste, and are regarded in Myanmar as highly beneficial for skin, blood and other diseases. [11] Often combined with [sesame oil](#) and fermented-rice washing-water, the whole plant, leaves (sometimes burnt to ash or crushed for juice), stems, branches, and roots are used together or separately. In Pakistan shrubs are grown as a hedge while its bitter quinine-like extract is used in traditional medicine to treat whooping cough and tuberculosis. [13].

Author itself has undergone to Case studies at father's own homeopathic clinic, for treating Renal stones with the leaves of "**B. Prionitis** traditional medicine" considering its amazing diuretic properties, 20 cases of patients suffering from renal stones were treated at different intervals. As the size of stone varied from patient to patient ranging from 10mm to 30mm. the patients were advised to take paste of three leaves orally, following with a glass of butter milk before going to bed for 3 days.

Observations were as follows:

50% percent of patients got relief within three days.

40% were asked to repeat the medication with interval of 5-6 days and they got relief.

10% were the patients who didn't had any significant relief even after repeating the medication.

Chemical Constituents:

The Barleriaprionitis leaves and flowering tops are reported to be rich in potassium salt [20]. Preliminary phytochemical analysis of hydromethanolic extract of *B. prionitis* whole plant indicated presence of flavonoid, glycoside, saponin, tannins and steroid [12]. Phytochemicals

isolated from *B. prionitis* such as balarenone, pipataline, lupeol, prioniside A and Prioniside B [10]. Glycoside are isolated from the areal plant are barlerinoside, verbascoside, shanzhiside methyl ester, 6-0-trans-p-coumaroyl-8-o-acetylshanzhiside methyl ester, barlerin, acetylbarlerin and 7- methoxydiderroside. Chromatographic examination of the alcoholic extract of the leaves and stems of *Barleriaprionitis* Linn, revealed the presence of iridinoid glycosides such as acetyl barlerin and barlerin [13,20,21]The leaves were reported to contain scutellarein, melilotic acid, synergic acid and 6-hydroxyflavones [10]. β -sitosterol, scutellarein 7- neohesperidoside and apigenine 7-O-glucoside are present in *B. Prionitis*. Two new anthraquinones compound isolated from *Barleriaprionitis* and characterized as 1,8, dihydroxy-2,7-dimethyl 3,6-dimethoxy anthraquinone,1,3,6,8-tetra methoxy-2,7-dimethyl anthraquinone.

Phytochemistry:

Preliminary phytochemical analysis of hydro-methanolic extract of *B. prionitis* whole plant indicated the presence of glycosides, saponins, flavonoids, steroids and tannins [18]. The leaves and flowering tops were reported to rich in potassium salts [5]. Several phytochemicals viz., balarenone (1), pipataline (2), lupeol (3), prioniside A (4), prioniside B (5) and prioniside C (6) has been isolated from the ethanolic extract of *B. prionitis* [10]. Numbers of glycosides include barlerinoside (7), verbascoside (8), shanzhiside methyl ester (9), 6-O-trans-p-coumaroyl-8-O-acetylshanzhiside methyl ester (10), barlerin (11), acetylbarlerin (12), 7-methoxydiderroside (13),lupulinoside (14) has been also isolated from the aerial parts [10]. Two anthraquinones derivatives has been also identified in this plant and their structures were characterized as 1,8, dihydroxy-2,7-dimethyl 3, 6-dimethoxy anthraquinone and 1,3,6,8-tetra methoxy-2,7-dimethyl anthraquinone[16]. The leaves were reported to contain scutellarein (15), melilotic acid (16), syringic acid (17), vanillic acid (18), p-hydroxybenzoic acid (19), 6-hydroxyflavones (20) [5]. Beside these phytochemicals, luteolin-7-O- β -D-glucoside (21), β -sitosterol (22), scutellarein 7-neohesperidoside (23), apigenin 7-O-glucoside (24), 13, 14-seco-stigmasta-5, 14-diene-3-a-ol (25) were also reported to present in *B. prionitis* [17] The structures of some phytochemicals are given as:

Phytochemical Analysis of B.Prionitis:

Plants part	Phytochemical/Nutrient	Test (extract details)	References
Leaf	Alkaloid TLC [30,31,33] Flavonoids Saponins TLC Tannin Phytosteroids Phenolic compound Terpenoids Not Specified Sterol (stigmasterol) Essential oil	(ME/ TLC) HPLC	[8,9]
Aerial part	Glycosides NMR [34-36] Terpenoid (lupeol) Pipataline, Balarenone, NMR (EE) 13,14- Seco-stigmasta-5,14-	NMR EE	[9,11]
Whole plant	Glycosides Borntrager's test Saponins Flavonoids Phenolic compounds and Tannins Phytosterols)	(HE, ME, EE), Legal's test (HE, ME, EE) Frothing test (HE, ME, EE, AqE) Ammonia test (HE), Alkaline reagent test (ME, CE, AqE), Shinoda test (CE, ME, AqE) FeCl ₃ test (HE, AqE, ME, EE), Lead acetate test (ME, EE, AqE), Bromine water test (ME, AqE, EE)	[12,13]

	Proteins and amino acid	Liebermann's test (ME, AqE), LiebermannBurchard test (ME, AqE) Biuret test (ME, EE), Ninhydrin test (ME, EE)	
Flower	Flavonoid Glycoside Neohesperidoside		[5]

Anti-Diabetic Activity: The antidiabetic activity of alcoholic extract of leaf and root of *B. prionitis* was evaluated by using alloxan monohydrate. *B. prionitis* leaves showed significant decrease in blood glucose level, glycosylated haemoglobin and significant increase in serum insulin and liver glycogen level. *B. prionitis* root showed moderate but non-significant anti-diabetic activity in experimental animals [23]. 25.

Antidiarrheal Activity: Butanol fraction of *B. prionitis* leaves showed significant anti-diarrheal activity. In vivo study showed that the butanol fraction dose dependently inhibited the castor oil induced diarrhea and PGE₂ induced enteropooling in sprague-dawley rats. The butanol fraction also reduced the gastrointestinal motility in response to charcoal-induced gut transit changes [20]

Diuretic Activity: Diuretic activity of *B. prionitis* flower extract was investigated using by administration of normal saline solution. Administration of aqueous flower extract was significantly increased the urination and sodium elimination but not potassium in rats. The diuretic effect of flower extract was comparable and significant with the reference drug furosemide [21]

Toxicity Studies: Alcoholic extract of roots and leaves of *B. prionitis* did not showed any toxic effect in adult albino rats. During the 14 days of study period death was not observed on oral administration of extract [25]. Using different dose of iridoid fraction in the safety

evaluation and maximum tolerance dose study the oral LD50 with no signs of abnormalities or any mortality observed [22]

Gastro-Protective Activity: Maximum protections were found to be 66.26% and 59.42% by iridoid fraction (200 mg/kg) in PL-induced ulcer and CRS-induced ulcer rat model. Iridoid fraction from leaves reduced ulcer index [20]. In ethanol-induced gastric ulcer rat model, methanolic extract of leaf (500 mg/kg bw) and ranitidine provided 67.7% and 75.5% inhibition of ulcer. Same dose of extract and drug displayed 70.3% and 62.2% inhibition in indomethacin-induced gastric ulcers model. Extract also showed efficacy against indomethacin-induced gastric mucosal damage and increased liver enzymes in ethanol-induced ulcer rat model [25].

Conclusion:

In the present studies it has been found that *B. Prionitis* has tremendous medicinal properties and can be used as a potential drug in various combinations to cure many diseases. Though it is a very commonly found herbal plant in almost every part of Asia but still its significant properties are rarely known and undiscovered. Hence further research is suggested to understand its pharmacological importance against numerous diseases and to identify its phytochemical metabolites. So that it can be used efficiently in pharmaceutical industry.

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