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### PHYTOCHEMICAL AND PHARMACOLOGICAL PROFILE OF BARLERIA PRIONITIS LINN. – REVIEW

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#### ABSTRACT

Barleria prionitis have been utilized for basic and curative health care since time immemorial. Barleria prionitis L. is one of the important herbal being used in Ayurvedic system of medicine. In traditional system of medicines part of the Barleria prionitis plant is used for the treatment of various diseases like toothache, fever, inflammation, gastrointestinal disorders, expectorant, boils, glandular swellings, catarrhal affections, ulcers, tonic and diuretic. A wide variety of biologically active constituents such as glycosides, flavonoid, saponin, steroid and tannins are present in his plant. The plant contains balerenone, prioniside A and B, lupeol, 6-hydroxyflavone, barlerin. This plant exhibits antioxidant, antibacterial, anti-inflammatory, anti-arthritis, hepatoprotective, antifungal, antiviral, mast cell stabilizing, antifertility and gastoprotective activity. This review will focus on the traditional uses, Phytochemical constituents isolated from the plant and pharmacological properties of different parts of Barleria prionitis.

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## INTRODUCTION

Use of plants as food and medicines ever since man started life on the planet. The plant kingdom is a potential drug targets and other active drug molecules waiting to be discovered. During the last decade, use of traditional medicine has expanded globally and gained popularity. Nowadays because of awareness of deleterious effects of modern synthetic drugs the plant based drugs are having a revived interest. Natural products can play a very important role in pharmaceutical industry as drug them or as drug carrier or bio-enhancers or excipient. Foreign researchers have always appreciated the traditional Indian healers [1]. The genus *Barleria* Linn. (Acanthaceae) consists of 28 taxa including 26 species. It is an old world genus, with its greatest center of species diversity in tropical East Africa, followed by South Africa and Asia. Some of the species belong to genus *Barleria* are *B. prionitis*, *B. acanthoides*, *B. aculeate*, *B. albostellata*, *B. buxifolia*, *B. cristata*, *B. greenii*, *B. lupulina*, *B. micans*, *B. observatrix*, *B. obtusa*, *B. opaca*, *B. popovii*, *B. longiflora*, *B. mysorensis*, *B. noctiflora*, *B. tomentosa*, *B. acuminata* and *B. strigosa* etc [2].

## BARLERIA PRIONITIS LINN DESCRIPTION

*Barleria Prionitis* Linn also known as Kate Koranti is well known medicinal Plant in Ayurvedic system of medicine. The other scientific names are *Barleria hystrix* Linn, *Barleria prionitis* Blanco and *Prionitis hystrix* Miq [2].

### Scientific classification

Kingdom	-Plantae
Subkingdom	-Tracheobionta
Division	- Magnoliophyta
Class	-Magnoliopsida
Subclass	-Asteridae
Order	- Scrophulariales
Family	Acanthaceae
Genus	- <i>Barleria</i>
Species	- <i>Prionitis</i> .

### Local names of the plant

English	- Yellow Hedge <i>Barleria</i> , Porcupine Flower
Gujarati	-Kantashila
Hindi	- Katsareya, kinti, kala bans
Bengali	- Kantajinti, Peetjhanti
Kannada	- Karunta, Mullugorante
Malayalam	- Chemmuli, Vaelmutti
Marathi	- Kate Koranti, Koranta, Pivala-koranta, kalsunda
Tamil	- Kaatu kanagaambaram, semmulli
Telugu	- mulligorinta chettu [2, 3].

In Ayurveda it is known as Koranda, kuranta, baana, sahachara, kurantaka, shairiya and pita-saireyaka [4]. It is commonly found in tropical Asia include India, Malaysia, Pakistan, Philippines, Srilanka and Yemen. This plant is distributed throughout the hotter parts of India and commonly grown in garden as a hedge plant [4, 2]. Flowering & fruiting of the plant seen in the month of August to March. *Barleria prionitis* is an erect, smooth, branched shrub, growing up to 1 to 2 meters high, with slender axillary spines. Leaves are elliptic to elliptic-ovate, 6 to 12 centimeters long, narrowed, and pointed at both ends. Flowers are yellow and axillary, with the upper ones in spikes. Bracts and calyx are green, with the outer bract usually fallacious. Corolla is about 4 centimeters long. Seed capsule is oval-shaped with a sharp pointed beak. It contains two fairly large, flat seeds, covered with matted hairs. Roots are central tap type, with lateral roots branching in all directions [2].



**Figure. 1 – Barleria prionitis plant.**

### **TRADITIONAL USES**

In Indigenous system of medicine in India, the leaf juice given in stomach disorder, urinary affections, ulcer and Fever [4]. The leaf juice mixed with honey and given to children with fever and catarrh [4]. The leaf juice is applied to lacerated soles of feet in rainy season. The leaf juice is mixed with coconut oil for pimples. Leaves and flowering tops used as diuretic. Barleria prionitis bark is used as diaphoretic and expectorant [2, 4, 5]. B. prionitis Root paste is applied over boils and glandular swelling. Ash obtained from whole plant, mixed with honey given in treatment of bronchial asthma. The Ayurvedic Pharmacopoeia of India recommends oil extract of Plant for arresting graying of hairs. The flowers are used internally for the treatment of migraine, internal abscesses, edema, urethral discharges, seminal disorder and reduce obesity [3, 6]. The whole plant is used in stiffness of limbs, enlargement of scrotum and sciatica. The whole plant also used in urinary infection, jaundice, hepatic obstruction and dropsy [4]. The plant formulation is prescribed in dysuria, rheumatic affections, internal abscesses and nerve disorder [6].

### **CHEMICAL CONSTITUENTS**

The Barleria prionitis leaves and flowering tops are reported to rich in potassium salt[4]. Preliminary phytochemical analysis of hydromethanolic extract of B. prionitis whole plant indicated presence of flavonoid, glycoside, saponin, tannins and steroid [7]. Phytochemicals isolated from B. prionitis such as balarenone, pipataline, lupeol, prioniside A and Prioniside B [8, 22]. Glycoside are isolated from the areal plant are barlerinoside, verbascoside, shanzhiside methyl ester, 6-O-trans-p-coumaroyl-8-o-acetylshanzhiside methyl ester, barlerin, acetylbarlerin and 7- methoxy diderroside. Chromatographic examination of the alcoholic extract of the leaves and stems of Barleria prionitis Linn, revealed the presence of iridinoid glycosides such as acetyl barlerin and barlerin [9,13,24]The leaves were reported to contain scutellarein, melilotic acid, synergic acid and 6-hydroxyflavones [10].  $\beta$ -sitosterol, scutellarein 7-neohesperidoside and apigenine 7-O-glucoside are present in B. Prionitis. Two new anthraquinones compound isolated from Barleria prionitis and characterized as 1,8, dihydroxy-2,7-dimethyl 3,6-dimethoxy anthraquinone,1,3,6,8-tetra methoxy-2,7-dimethyl anthraquinone [11].

### **PHARMACOLOGICAL ACTIVITY**

Barleria prionitis plant exhibits wide range of pharmacological actions. The pharmacological actions of Barleria prionitis are summarized in table 1.

Table 1. Pharmacological activities of *B. prionitis* Linn.

Sr.no.	Plant parts	Study	References
1	Whole plant Areal part Leaf and stem	Antioxidant	[12-14]
2	Bark Whole plant Leaf juice Leaf, stem and bark	Antibacterial	[15-18]
3	Root Whole plant	Anti-inflammatory	[19,20]
4	Leaves Whole plant	Anti-arthritis	[20,21]
5	Leaves and stem	Hepatoprotective	[22]
6	Stem and root Bark	Antifungal	[5,23]
7	Whole plant	Antiviral	[24]
8	Leaf and root	Anti-diabetic	[25]
9	Whole plant	Mast cell stabilizing activity	[07]
10	Whole plant	Anthelmintic activity	[26]
11	Root	Antifertility	[27,28]
12	Areal parts	Immuno-modulatory activity	[29]
13	Leaves	Antidiarrheal activity	[30]
14	Leaves	Antihypertensive	[31]
15	Leaves Whole plant	Gastoprotective	[32,33]
16	Leaves	Antipyretic	[34]
17	Flower	Diuretic	[35]

#### Antioxidant activity:

Prionitis whole plant was investigated for the antioxidant activity using DPPH radical, ABTS scavenging activity, hydroxyl radical scavenging activity, reducing power assay and nitric oxide scavenging activity. In vitro result showed that ethanol extract showed more potent antioxidant activity than aqueous extract. The result shows good correlation between antioxidant potential and high phenolic content in ethanol extract [12]. Antioxidant potential of medicinal plant *Barleria prionitis* was studied by using DPPH assay. The ethylacetate soluble fractions have showed the maximum activity. Aerial parts of *Barleria prionitis* contain chemical constituent's phenylethanoid glycoside, barlerinoside, iridoid glycosides, shanzhiside methyl ester, 6-o-trans-p-coumaroyl-8-o-acetylshanzhiside methyl ester, barlerin, acetylbarlerin, 7-methoxydideroside and lupulinoside exhibited different free radical Scavenging activities [13]. The antioxidant activity of different extracts of *Barleria prionitis* leaf and stem was studied. The total phenolic contents were determined by Folin-ciocalteu method. The antioxidant potential and reducing power of all the prepared extracts were measured against DPPH as compared to standard ascorbic acid, and BHA respectively. The result indicated that the phenolic contents were higher in methanolic extracts of leaf and stem [14].

#### Antibacterial activity

Prionitis bark extracts such as Acetone, methanol, ethanol, aqueous screened for in vitro antimicrobial activity against four oral bacteria *Streptococcus mutans*, *Staphylococcus aureus*, *Pseudomonas sp.*, *Bacillus sp.* The antimicrobial potential of *B. prionitis* bark against *Bacillus sp.* was comparable with the standard antibiotic drug ciprofloxacin [15]. Ethanol, chloroform and petroleum ether extract of *B. Prionitis* showed comparative antibacterial activity on various bacterial species. The different extracts of the plant were first prepared on basis of various concentration levels and then extensively applied on selected bacterial culture media for determination of minimum inhibitory concentration and these extracts exhibited significant antibacterial activity [16]. Leaf juices of *Barleria prionitis* are used by rural people in the treatment of oral ailments such as dental troubles, gum ailments, pyorrhea, dental carries and mouth ulcers. Zone of inhibition and minimum inhibitory concentration all the extracts showed that ethanolic extract had more antimicrobial as compared to the aqueous extract [17]. The antimicrobial activity of leaf, stem and root of *B. prionitis* by using solvent chloroform, acetonitrile and ethanol was studied. Antimicrobial activity was done by gradient plate technique. Leaf, stem and root extracts of *B. prionitis* showed the significant antimicrobial activities [18].

#### Anti-inflammatory activity

*Barleria prionitis* L. roots paste is used traditionally in the treatment of swelling and boils. The aqueous extract showed significant inhibition of edema as compared with reference drug indomethacin [19]. The methanol extract of *Barleria prionitis* Linn. Showed significant anti-inflammatory activity comparable to control and standard drug indomethacin. Total aqueous fraction from the methanol-water extract of *Barleria prionitis* was evaluated for anti-inflammatory against different acute and chronic animal test models such as carrageenan induced oedema in rats, histamine induced oedema in rats, dextran induced oedema in rats and carrageenan induced oedema in adrenalectomised oedema in rats. It exhibited significant anti-inflammatory activity against different inflammagens like carrageenan, histamine and dextran [20].

**Anti-arthritic activity**

Anti-arthritic activity of ethylacetate fractions of chloroform extract from leaves of *Barleria prionitis* was studied against formaldehyde-induced acute non immunological and Freund's Complete Adjuvant-induced chronic immunological arthritis in rats. Dose dependent and significant inhibition of edema was observed in both acute as well as chronic models. The extract showed most potent and significant paw edema inhibition which is supported by the results of body weight, biochemical parameters, motor in coordination and nociceptive threshold in Freund's Complete Adjuvant-induced arthritis model [21]. The aqueous Fraction from the methanol-water extract of *Barleria prionitis* Linn. was evaluated for anti-arthritic activities against different acute and chronic animal test models. Significant anti-arthritic activity was observed in adjuvant-induced polyarthritis test in rats. The aqueous fraction showed inhibition of vascular permeability and leucocytes migration [20].

**Hepatoprotective activity**

Iridoid enriched fraction from the ethanol-water extract of leaves and stem of *B. prionitis* was found to be significant hepatoprotection against carbon tetrachloride, galactosamine and paracetamol induced hepatotoxicity. Silymarin was used as standard drug. Iridoid enriched fraction showed significant and concentration dependent hepatoprotective potential as it reversed the majority of the altered hepatic parameters in experimental liver damage in rodents [22].

**Antifungal activity**

Petroleum ether, dichloromethane, ethanol and methanol extract of different parts of *Barleria prionitis*, *Barleria greenii* and *Barleria albostellata* studied for its antifungal activity. All the extracts demonstrated both fungi static and fungicidal activities [23]. Antifungal activity of *B. prionitis* bark studied on two *Candida albicans* strains and *Saccharomyces cerevisiae*, involved in oral diseases of human. Acetone, methanol, ethanol, aqueous (hot and cold) extracts of *Barleria prionitis* bark were screened for in vitro activity against four three oral fungi *C. albicans* strain 1, 2 and *S. cerevisiae*. Methanolic extract of *B. prionitis* bark showed much more potent activity against all the tested oral fungi than the standard drug amphotericin-B thus having a great potential to control candidiasis and other oral fungal infections [05].

**Antiviral activity**

Two new iridoid glycosides were isolated from *Barleria prionitis*. The antiviral activity and cytotoxic effects of the isolated compound and control antiviral compound were determined by using viral cytopathic effect inhibition assay. 6-o-trans-p-coumaroyl-8-o-acetylshanzhiside methyl ester and 6-o-cis-p-coumaroyl-8-o-acetylshanzhiside methyl ester showed potent *in vitro* activity against respiratory syncytial virus [24].

**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 [25].

**Mast cell stabilization activity**

Membrane stabilization and mast cell protection activity of hydroalcoholic extract of *B. prionitis* whole plant was studied. In-vitro membrane stabilization was performed by using hypo saline erythrocyte membrane hemolysis and mast cell degranulation was induced by compound 48/80. The hydro alcoholic extract significantly inhibited hypo saline induced erythrocyte membrane hemolysis and the compound 48/80 induced mast cell degranulation in dose dependent manner [07].

**Anthelmintic activity**

The whole plant extract of *B. prionitis* was reported to show anthelmintic activity against *Pheretima posthuma*. Various concentrations aqueous and ethanolic extracts was evaluated in the bioassay involving determination of time of paralysis and time of death of the worms. Albendazole was used as standard anthelmintic drug. The results showed that the ethanolic and aqueous extracts significantly exhibited paralysis in worms in lower doses and also caused death of worms especially at higher concentration, as compared to standard drug [26].

### Antifertility activity

Isolated fraction of *B. prionitis* root methanolic extract showed a reduction on spermatogenesis without affecting general body metabolism. Sperm motility and density in cauda epididymides was reduced significantly. Total protein, glycogen, sialic acid and seminal vesical fructose contents of testis were reduced. Spermatogenic cells such as primary spermatocytes, secondary spermatocytes and round spermatids were declined significantly in treatment groups. There was no significant change in the number of Sertoli cells and spermatogonia in the treatment group [27]. Male antifertility activity of the  $\beta$ -sitosterol which is an active component isolated from the methanolic root extract of *Barleria prionitis* in the male albino rats was investigated. At the end of the experimental duration, treated males were sacrificed and subjected to biochemical, hormonal and sperm analysis. Fertility was assessed by mating treated rats with normally cycling virgin females. Average weight of reproductive organs, serum levels of Testosterone, Follicular stimulating hormone and Luteinizing hormone, levels of Protein, Ascorbic acid, Glycogen, Fructose, sperm motility and sperm density was decreased significantly as compared to control group while Cholesterol level was increased significantly. Fertility percentage was also decreased in treated groups. Body weight remained unchanged. The results show that  $\beta$ -sitosterol from the roots of *Barleria prionitis* causes suppression of spermatogenesis and fertility thereby suggesting the potential of  $\beta$ -sitosterol for the development of male contraceptive [28].

### Immunomodulatory activity

Immunomodulatory activities of the iridoids fraction i.e. n-butanol fraction of methanol extract from *Barleria prionitis* aerial parts was studied by using in-vitro nitroblue tetrazolium test and neutrophils candidacidal assay and in vivo immunomodulatory activity on cellular and humoral immune responses to the antigenic challenge by sheep red blood cells and by neutrophil adhesion test, phagocytic activity and cyclophosphamide-induced myelosuppression. Iridoids fraction i.e. n-butanol fraction of methanol extract showed significantly increased the intracellular killing activity. Pretreatment with n-butanol fraction of methanol extract evoked a significant increase in percent neutrophils and neutrophils adhesion to nylon fiber. N-butanol fraction of methanol extract potentiated significantly the macrophage phagocytic activity and ameliorated the red blood cells, total white blood cells and platelet count and hemoglobin concentration. Iridinoid fraction was found that potent immunotimulant, stimulating both the specific and nonspecific immune mechanisms [29].

### 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 PGE<sub>2</sub> induced enteropooling in sprague-dawley rats. The butanol fraction also reduced the gastrointestinal motility in response to charcoal-induced gut transit changes [30]

### Antihypertensive activity

Antihypertensive activity of methanolic extracts of leaves of *B. prionitis* linn determined by using desoxycorticosterone acetate salt induced antihypertensive model. Hypertension was induced by injecting desoxycorticosterone acetate salt twice a week for six weeks with sodium chloride. Systolic and diastolic blood pressure was measured every week. *B. Prionitis* showed significant antihypertensive effect in desoxycorticosterone acetate salt induced hypertension in rats [31]

### Gastoprotective activity

Gastoprotective activity of chloroform extract of leaves of *B. prionitis* was studied by using experimental in-vivo models. Ulcer was induced by non-steroidal anti-inflammatory drugs and pylorus ligation. Parameters of gastric secretion (volume, pH, total protein, free and total acidity) were determined by pylorus ligation model. The result showed that the chloroform extract and ethyl acetate fraction prevented the gastric ulceration caused by indomethacin. Ethyl acetate fraction inhibited gastric secretion in pylorus ligated rats. The result showed that chloroform extract of leaves of *Barleria prionitis* leaves possess antiulcer activity and thus supports the traditional use of this plant in treatment of gastric ulcer [32]. Antiulcer activity of different extracts of *B. prionitis* Linn. Was evaluated by using pyloric ligation induced gastric ulcer model. Ranitidine used as a standard antiulcer drug. In pylorus ligation induced ulcer model, various parameters (gastric volume, pH, total acidity, free acidity, and ulcer index) were studied. Pretreatment of methanolic extract of whole plant of *B. prionitis* Linn. Showed significant decrease in the gastric volume, total acidity and free acidity. Iridoid enriched extracts were effective in reducing ulcers exhibiting their antiulcer activity [33].

### Antipyretic activity

*Barleria prionitis* leaves are used in traditional medicines for various ailments. Antipyretic activity of methanolic extract of *B. prionitis* was studied by using Brewer's yeast induced pyrexia and paracetamol used as standard drug. Neck and rectal temperature were recorded by using digital thermometer and compared with control group. Methanolic leaf extract of *B. prionitis* showed significant antipyretic activity [34].

### 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 [35].

## TOXICITY STUDIES

Alcoholic extract of roots and leaves of *B. prionitis* did not show 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 LD<sub>50</sub> with no signs of abnormalities or any mortality observed [22].

## CONCLUSION

Herbal medicine plays a major role in the development of modern civilization. *B. prionitis* is an important plant in ayurvedic medicine in India. This review article briefly explains the traditional uses, phytochemical and pharmacological actions of *B. prionitis*. The plant has found to be broad spectrum of activities due to presence of active constituents like glycosides, flavonoid, saponin, steroid and tannins. The plant has reported to have variety of pharmacological actions like antioxidant, antibacterial, anti-inflammatory, anti-arthritic, hepatoprotective, antifungal, antiviral, mast cell stabilizing, antifertility and gastroprotective activity of the extract and isolated molecule of the plant. There is requirement of further study such as the conversion of these pharmacological activities into drugs, proper scientific evaluation includes isolation of responsible phytochemical, their mode of action, toxicity and proper standardization need to be explored. From the current review, we conclude that plant *Barleria prionitis* could be useful for development of commercial drugs.

## REFERENCES

1. Vetriclevan T, Jegadeesan M. Anti-diabetic activity of alcoholic extract of *Aerva lanata* (L.) Juss. Ex Schultes in rats. *J of Ethnopharmacology*. 2010; 80:103-107.
2. Shendage SM, Yadav SR. Revision of the Genus *Barleria* (Acanthaceae) in India. *Rheedea*, 2010; 20: 81-130.
3. Banerjee D, Maji A, Banerji P. *Barleria prionitis* Linn: A review of its traditional uses, phytochemistry, pharmacology and toxicity. *Research Journal of Phytochemistry*. 2012; 6:31-41.
4. Khare CP. *Indian Medicinal Plants: An Illustrated Dictionary*. 1<sup>st</sup> ed. New York: Springer Science, 2007. pp. 82-83.
5. Aneja KR, Joshi, Sharma C. Potency of *Barleria Prionitis* L. bark extracts against oral diseases causing strains of bacteria and fungi of clinical origin. *New York Science Journal*. 2010; 3: 5-12.
6. Khare CP. *Indian Herbal Remedies: Traditional Western Therapy, Ayurvedic and other traditional uses*, Botany. 1<sup>st</sup> ed. New York: Springer; 2004. pp. 93-94.
7. Maji AK, Bhadra S, Mahapatra S, Banerji P, Banerjee D. Mast cell stabilization and membrane protection activity of *Barleria prionitis* L. *PHCOG J*. 2011; 3: 67-71
8. Ata A, van den Bosch SA, Harwanik DJ, Pidwinski GE. Glutathione S-transferase and acetylcholinesterase-inhibiting natural product from medicinally important plant. *Pure Appl. Chem*. 2007; 79:2269-76
9. Taneja SC, Tiwari HP. Structure of two iridinoids from *Barleria prionitis* Linn. Pergamon press. 1975:1995-98
10. Daniel M. *Medicinal Plants: chemistry and properties*. 1<sup>st</sup> ed. USA: Science publishers; 2006. Pp. 78.
11. Ganga Raju S, Naidu K, Chakradhar V, Prasad R. Anthraquinones from *Barleria prionitis*. *Indian drugs*. 2002; 39(7): 400-401.
12. Chetan C, Suraj M, Maheshwari C, Arhuland A, Priyanka P. Screening of antioxidant activity and phenolic content of whole plant of *Barleria prionitis* Linn. *Int J. Research Ayurveda pharm*. 2011; 2: 1313-1319.
13. Ata A, Kalhari KS, Samarasekara R. Chemical constituents of *Barleria prionitis* and their enzyme inhibitory and free radical scavenging activities. *Photochemistry letter*. 2009; 2: 37-40
14. Sharma P, Sharma GN, Srivastava B, Jadhav HR. Evaluation of antioxidant potential of *Barleria prionitis* leaf and stem. *American Journal of phytomedicine and clinical therapeutic*. 2014; 2:11 1177-86.
15. Aneja KR, Joshi R, Sharma C. Potency of *Barleria Prionitis* L. bark extracts against oral diseases causing strains of bacteria and fungi of clinical origin. *New York Sci. J*. 2010; 3: 5-12.
16. Gangopadhyay A, Manalkar J, Ghosh A, Pramanic G, Karmakar Sujit. Comparative antibacterial study of *Barleria prionitis* Linn. Leaf extracts. *International journal of pharmaceutical and biological archives*. 2012; 3: 2391-93.
17. Sawarkar HA, Kashyap PP, Panday AK, Singh MK, Kaur CD. Antimicrobial and cytotoxic activities of *barleria prionitis* and *Barleria grandiflora*: a comparative study. *Bangladesh Journal of pharmacology*. 2016; 11: 802-809
18. Panchal P, Singh K. Antimicrobial activity of *Barleria prionitis* on pathogenic strains. *International journal of current pharmaceutical research*. 2015; 7(4): 73-75
19. Khadse CD, Kakde RB. Anti-inflammatory activity of aqueous extract fractions of *Barleria prionitis* L. roots. *Asian J. Plant Sci. Res*. 2011; 1: 63-68
20. Singh B, Bani S, Gupta DK, Chandan BK, Kaul A. Anti-inflammatory activity of TAF an active fraction from the plant *Barleria prionitis* Linn. in experimental animal. *Phytother. Res*. 2003; 19: 391-404
21. Choudhary M, Kumar V, Gupta P, Singh S. Anti-arthritic activity of *Barleria prionitis* Linn. leaves in acute and chronic models in Sprague Dawley rats. *Bulletin of Faculty of Pharmacy*. 2014; 52: 199-209.
22. Singh B, Chandan BK, Prabhakar A, Taneja S. C, Singh J, Qazi GN. Chemistry and hepatoprotective activity of an active fraction from *Barleria prionitis* Linn in experimental animal. *Phytother. Res*. 2005; 19: 391-404.
23. Amoo SO, dhala AR, Finnie JF, Staden JV. Antifungal, acetyl cholinesterase inhibition, antioxidant and Phytochemical properties of three *Barleria* species. *South African Journal of Botany*. 2011; 77: 435-445.
24. Chen JL, Blank P, Stoddart CA, Bogan M, Rozhon EJ. New iridoids from medicinal plants *Barleria prionitis* with potent activity against respiratory syncytial virus. *J. Nat. Prod*. 1998; 61(10):1295-1297.
25. Dheer R, Bhatnagar P. A study of the antidiabetic activity of *Barleria prionitis* Linn. *Indian J. Pharmacol*. 2010; 42: 70-73.

26. Chavan CB, Hogade MG, Bhinge SD, Kumbhar M, Tamboli AK. In vitro anthelmintic activity of fruit extract of *Barleria prionitis* Linn against *pheretima posthuma*. *Int J Pharmacy Pharm Sci.* 2010; 2 (3):49-50
27. Verma P K, Sharma A, Joshi SC, Gupta RS, Dixit VP. Effect of isolated fractions of *Barleria prionitis* root methanolic extract on reproductive function of male rats: Preliminary study. *Fitoterapia.* 2005; 76: 428-432.
28. Singh K, Gupta RS. Antifertility activity of B-sitosterol isolated from *Barleria prionitis* (L) roots in male albino rats. *Int. J. Pharm. Pharm. Sci.* 2016; 8(5). 88-96.
29. Ghule BV, Yeole PG. In vitro and in vivo immunomodulatory activities of iridoids fraction from *Barleria prionitis* Linn. *Journal of Ethanopharmacology.* 2012; 141: 424-431.
30. Jaiswal SK, Dubey MK, Verma AK, Das S, Vijaykumar M, Rao CV. Evaluation of iridoid glycoside from leave of *Barleria prionitis* as an antidiarrheal activity: an ethanopharmacological study. *Int. J. Ph. Sci.* 2010; 2(3) : 680-686
31. Marya BH, Bothara SB. Investigation of antihypertensive activity of leaves of *Barleria prionitis* in DOCA salt induced hypertensive rats. *Int. J. Pharm.Sci. Rev. Res.* 2013; 18(02):17-19
32. Choudhary M, Kumar V, Gupta P, Singh S. Gastro protective potential of chloroform leaves extract of *Barleria prionitis* Linn. From traditional use to scientific approach. *Advances in Chemistry and Biochemistry Sciences.* 2014; 1: 01-11.
33. Kaur PK, Karan M. Evaluation of antiulcer activity of an indigenous drug *Barleria prionitis* Linn. *International journal of pharmaceutical sciences and research.* 2016; 7 (7): 2775-2780.
34. Joseph L, George M, Brijwal P, Chandran RT. Evaluation of antipyretic activity of methanolic leaf extract of *Barleria prionitis* in albino rats. *Am. J. Pharmtech Res.* 2016; 6 (2): 465-471
35. Musale SB, JagtapVA, Patil MS, Chittam KP, Wagh RD. Diuretic activity of *Barleria prionitis* Linn flower extract. *International journal of drug discovery and herbal Research,* 2011; 1(1): 20-21.



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