Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env. Pharmacol. Life Sci., Vol 9[4] March 2020 : 150-158

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.876
Universal Impact Factor 0.9804
NAAS Rating 4.95

REVIEW ARTICLE **OPEN ACCESS**

Pharmacognosy, Phytochemistry and Traditional Uses: *Barleria Prionitis*

S. S. Shinde*[1], H. L. Tare[2], N. S. Deshmukh[2], S. R. Chaudhari[3], G. D. Ghangale[4], B. V. Udugade[5]
1. Trimurti Shikshan Prasarak Mandal's Trimurti Institute of Pharmacy, Jalgaon, M.S., India.
2. Amrutvahini Sheti and Shikshan Vikas Sanstha's Amrutvahini College of Pharmacy, Sangamner, Savitribai Phule Pune University, M.S., India.
3. KJ's Educational Institute's Trinity College of Pharmacy, Pune, M.S., India.
4. Shri Gajanan Maharaj Shikshan Prasarak Mandal's, Sharadchandra Pawar College of Pharmacy, Dumbarwadi, Otur, Tal. Junnar, Dist. Pune, M.S., India
5. Dnyanganga Education Society's Mandesh Institute of Pharmaceutical Science and Research Center, Mhaswad, Tal. Man, Dist. Satara, M.S., India.
Email- harshaltare51@gmail.com

ABSTRACT
Barleria prionitis, belonging to Acanthaceae family, is small spiny shrub, normally familiar as "porcupine flower" with a number of vernacular names. It is indigenous plant of south Asia and certain regions of Africa. The therapeutically use of its flower, root, stem, leaf and entire plant against numerous disorders including fever, cough, jaundice, severe pain are recognized by ayurvedic and other traditional systems. As a significant source of secondary metabolites including saponin, tannin, flavonoid, alkaloid, glycoside,, phenolic compounds recent pharmacognostic screening renders its effectual functions as potent antioxidant, anti-microbial, anti-inflammatory, hepatoprotective, gastro-protective, agent etc. Although having a potential remedial significance. It is still underutilized. The review can be considered as a bird's eye view highlighting the current progress of Barleria prionitis in pharmacological and pharmacognostic field with its prominent folk uses.
Keywords: Barleria prionitis, hepatoprotective, traditional systems.

Received 27.01.2020 Revised 11.02.2020 Accepted 19.03.2020

INTRODUCTION

The word herb has been shaped from the Latin word, herb and an old French word herb. These herbs that have restorative quality give discerning intends to the treatment of numerous interior aliments, which are generally viewed as hard to cure. *Barleria prionitis* plant is an enduring, thick therapeutic plant. Barleria family containing 300 species for therapeutic and Ayurveda [1] The entire plant is utilized for therapeutic and ayurvedic prescription. *Barleria prionitis* generally known as Vajardanti it is utilized for different illnesses, for example asthma, whooping hack, ailment, fever, heaps, ulcer, bothering, control wound healing, bleeding diseases, liver diseases, bubbles, aggravation, solidness of appendages expanding force, gout, oedema, jungle fever, leukoderma scabies, toothache, joints torment, urinary contamination, jaundice, gastrointestinal clutters, hepatoprotective, snakebites, liver diseases and neuralgia. A ton of endeavors have been made by few analysts to substantiate the viability of plant over the span of natural and pharmacological exercises to cure of ailments. [2, 3, 4, 5].

DISTRIBUTION

In India is normally found in Andaman and Nicobar, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Jharkhand, Kerala, Karnataka, Lakshadweep, Maldives, Madhya Pradesh, Maharashtra, Orissa, Pondicherry, Rajasthan, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal.[13,14].

PLANT PROFILE

PLANT DESCRIPTION:

Barleria prionitis is developed as a decorative and restorative plant in Asia. It is an erect, thick, thorny under shrub coming up to 0.6 to 1.5 m high. *Barleria prionitis* considered yearly or perpetual plant amid the dry season. Its stem, leaves and blooms pass on yet roots alive. The vegetative develops stormy season.

STEM:

Erect 1.8mm thick, terete, hard, glabrous, hubs, swollen, spreading at hubs, youthful stem dark, somewhat four calculated with 3-4 divariate spines hub leaf. Stem tube shaped with longitudinally orchestrated remotely grayish to light dark coloured. A couple of develop stems marginally empty. [15,16]

FLOWERS:

Tubular yellow-orange 4.0 cm long blooms with distending stalks. Sessile regularly single in lower axils 16 by 4.5 mm, elongated, intense, glabrous; bracteoles 1.3 cm long, barely straight, subulate, calyx, one of the external sepals more than 1.3 cm long, 3.4 mm wide, two internal sepals 1.5 mm wide and long, upper lip 2 cm long four lobe, rond whole tube 2.2 cm long.[17,18]

LEAF:

Oval-ellipsoid moulded, variable in scrutinize to 10 cm long 4 cm wide, elliptic whole, intense reticulate, unicostate, labours above, underneath petiole short.[19,20]

SEED:

Oval-took care of business to 2 cm since a long time ago seed, case containing two expansive 8 mm long, 5 mm wide level seeds with plush hairs.[21,22,23]

Scientific classification:

Biological Name *Barleria prionitis*
Family Acanthaceace
Synonyms Barleria hystrix Linn. Prionitis hystrix Prionitis pubiflora [24,25]

Chemical constituent:

Parts	**Chemical constituent**
Leaf	Flavonoids, saponin, sterol, tannin, terpenoid
Flowers	Flavonoids, Neohespericloside
Arterial Parts	Balerenone, terpenoid, barlerinoside
Whole Plant	Glycoside, saponin, flavonoid, phenolic compound, carbohydrates, sitosterol, potassium[26,27]

Properties:

Taste Bitter and sweet
Qualities Light for digestion
Potency Hot
Action Reduce cough

Ayurvedic uses:

Kapha Destroy poison
Mutral Used for urination
Vatahar Used for Vata
Keshya Used for hair problem

MEDICINAL PROPERTIES AND TRADITIONAL USES

Table 1: Traditional use of *Barleria Prionitis*

Plant Parts	**Disorders**	**Application Mode**	**Ref.**
Leaf	Skin diseases	Crushed leaf is given to skin	[13]
	Scabies	Paste from of fresh leaf	[6]
	Cough and cold	Not specified	[8,9]
	Pus in ears	Applied as extract	[14]
	Catarrhal affections in children	Juice directly applied	[12]
	Irritation and stiffness of limbs	Not specified	[10]
	Glandular swelling and boils	Given as juice directly	[12]
	Fever	Decoction with honey for 7 days to cure	[19]
	Whooping cough	Juice form or decoction is given	[12,15]
	Leucoderma	Leaf ash with butter	[6]
	Wound	Crushed from directly applied	[16,17]

	Enlarged scrotum and sciatica	Not specified	[10]
	Dropsy	Directly as a juice	[12]
	Gastric problems	Juiced obtained from macerated	[13]
	Cataract	Not specified	[11]
	Toothache	Paste or juice on area	[12,18]
	Mouth ulcers	Chewed and sap is swallowed	[18]
Whole Plant	Cyst	Prepared oil is used externally	[20,21]
	Whooping cough	Dried plant is used	[22]
	Gout	Paste is applied externally as ointment	[18]
	Dysuria	Used by formulation	[4]
	Respiratory problems	Not specified	[23]
	Toothache	Plant decoction	[14]
	Pyorrhoea	Plant decoction	[14]
	Bronchial asthma	Mixed with honey	[4]
	Tonsillitis	Applied by formulation	[25]
	Greying of hair	Oil extract is given	[4]
Stem	Dropsy and liver congestion	Powder with cow milk	[6]
	Dropsy	Juice of bark directly	[24]
Root	Fever	Directly powdered is taken to cure	[26]
	Boils and glandular swelling	Paste from is directly applied	[10]
	Rheumatic fever	Paste with goat milk is given	[6]
	Jaundice	Not specified	[4,29]
	Snakebite	Decoction is taken orally	[27]
	Expel out spines	Extract is applied on skin	[28]
	Whooping cough	Used as formulation	[6]
Flower	Viral edema	Not specified	[22]
Seed	Edema	Paste is taken daily once	[18]
Shoot	Asthma	Used by formulation	[6]
	Whooping cough	Prepare tablet with honey	[6,29]

1. Remove additional mucous from the body.
2. Relieve toothache.
3. Reducing aggravation.
4. Prevent stiffness.
5. Helps in urinary issues, stone, oedema.
6. Rheumatic affections.
7. Jaundice.
8. Haemoptysis.

PHYTOCHEMICAL ASSESSMENT OF *BARLERIA PRIONITIS*

For the presence of efficacious secondary metabolites, it is not only economical for plant itself but also beneficial for better health of us. Scientist are already isolated and characterized phytochemicals such as alkaloid, flavonoids, saponins, tannin, steroid, terpenoid, sterol (stigmasterol), phenolic compound and essential oil from its leaf by different qualitative tests. Its arial parts contain a large quantities of glycoside (6-O-trans-p-coumaroyl-8-o-acetylshanzhiside methyl ester, barlerin, terpenoid and 13, 14-seco-stigmasta-5, 14-diene-3-ol identified by NMR. Large amount of secondary metabolites such as glycoside, saponins, flavonoids, phenolic compound, tannins, alkaloids, phytosterols, poluphenol and steroids are present in whole plant detected by different Phytochemical tests. Flowers contains significant Phytochemical including flavonoid, glycoside. New compound 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*.

PHARMACOLOGICAL ACTIVITIES OF *BARLERIA PRIONITIS*

Anti-helminthic activity:

Ethanolic and aqueous extracts of whole plant exhibited paralysis in lower doses (50, 75 and 100 mg/ml) and triggered death at higher concentration of 100 mg/ml against Pheretima posthuman worms.[28]

Anti-arrithmatic activity:

Ethyl acetate fraction (125 and 250 mg/kg) of leaf significantly suppressed the joint swelling after 8-10 days administration in formaldehyde induced arthritis model and it also decreased significant level of arthritis score with weight gain in FCA induced arthritis rat model.[29,30]

Table 2:- Phytochemicals composition of *Barleria prionitis*.

Plant Part	Phytochemicals/ Nutrient	Test(Extract Details)	Ref.
Leaf	Alkaloids	TLC (ME)	[30,31,32]
	Flavonoids	TLC (ME)	
	Saponins	TLC (ME)	
	Tannin	TLC (ME)	
	Phytosteroids	TLC (ME)	
	Phenolic compound	TLC (ME)	
	Terpenoids	Not specified	[31]
	Sterol (stigmasterol)	HPLC	
	Essential oil	Not specified	[32]
Arial Part	Glycoside	NMR	[34,36]
	Terpenoid (lupeol)	NMR (EE)	[37]
	Pipataline, Balarenone, 13,14-seco-stigmasta-5,14-diene-3-ol	NMR (EE)	
Whole Plant	Glycosides	Borntrager's test (HE, Me, EE), legal's test (HE, ME, EE)	[38,40]
	Saponins	Frothing test (HE, ME, EE, AqE)	
	Flavonoids	Ammonia test (HE), Alkaline reagent test (ME, CE, AqE), Shinoda test (CE, ME, AqE)	
	Phenolic compound and tannins	FeCl3 test (HE, AqE, ME, EE), Lead acetate test (ME, EE, AqE), Bromine water test (ME, AqE, EE)	
	Steriods	Salkowski test (HE)	[38]
	Alkaloids	Mayer's reagent (PeE, ME, EE), Hager's reagent (PeE), Wagner's reagent (PeE, ME, EE), Dragendorff's reagent (PeE, ME, EE)	[39,40]
	Carbohydrates	Molisch test (ME,EE), Fehling's solution (ME, EE), Benedict's reagent (ME, EE)	
	Phytosterol	Liebermann's test (ME, AqE)	
	Protein and amino acid	Biuret test (ME, EE), Ninhydrin test (ME, EE)	
	Polyphenol	Folin-ciocalteu test (EE, AqE)	[43]
	Anthraquinone	Chemical tests	[41]
Flower	Flavonoid	Not specified	[4]
	Glycoside	Not specified	
	Neohesperidoside	Not specified	

Anti-hypertensive activity

Enalapril, methonolic extracts at 200 and 400 mg/bw of leaf possessed anti-hypertensive effect as 136.5±2.51, and 143±3.11 mm Hg on systolic blood pressure and 103±2.54, 100.5±2.35 mm Hg diastolic blood pressure after six weeks treatment.[31]

Diuretic activity

Aqueous root extract (100mg/kg) produced significant dieresis (12.58±0.80 urine volume in 24hr) compare with furosemide at 20mg/kg (12.58±0.80 urine volume in 24hr) and increased sodium elimination.[32]

Antioxidant effect

The MeOH extract of root, leaves and stems showed potent antioxidant activity. EtOH extract of whole plant of *Barleria prionitis* showed potent antioxidant activities. It was reported that the antioxidant activity of MeOH extract of leaf and stem were showed IC50 values 63.41±0.32, 81.69±0.40, respectively. Reducing power of MeOH extract of B.prionitis was observed maximum. MeOH leaf extract showed significant high antioxidant activity (61.73) in 6000 ppm concentration followed by PET bark extract (59.11)5. In vitro antioxidant activity of crude MeOH extract of B.prionitis was reported by Khobragrade et al., [33]

Anti-diabetic activity:

A significant reduction in blood glucose level and glycosylated haemoglobin has been found in animals treated with *Barleria prionitis* leaves extract. Beside this, significant increase in serum insulin level and

liver glycogenlevel and decrease in the body weight was also observed. All these result indicate anti-diabetic activity of *Barleria prionitis*.[34]

Larvicidal activity:

LC50 values were found to be 34.756, 31.351 and 28.577 mg/ml in ACE, CHCL3 and MeOH extract against *Culex tritaeniorhynchus*, respectively.[35]

Anti-fertility activity:

The root extract of B.prionitis showed the antifertilitypotential67. Oral administration of MeOH root extract reduced the sperm formation in male albino rats67, 68. Root extract decreased the formation of round spematids, sperm motility, spermatogonia, preleptotene spermatocytes population and mature leading cells.[36]

Antibacterial activity:-

Acetone, ethanol, methanol extract of bark and ciprofloxacin showed significantly activity against Streptococcus mutants (14.95±1, 11.94±1, 15.65±0.57 and 27.32±0.57 mm) Staphylococcus aureus (14.31±0.57, 14.0±0, 16.32±0.57 and 34.66±0.57 mm). Lowest MIC was found to be 5 mg/ml for chloroform extract of leaf against Salmonella typhi, Bacillus subtilis, Vibro cholera-813, Micrococcus luteus and Citrobacter. On the other hand, petroleum ether and ethanol extract of leaf showed 3.33 and 10 mg/ml against Bacillus subtilis in MIC method.[37]

Central nervous system depressant activity:-

Ethyl acetate portion (at dose concentration of 125 and 250 mg/kg) and diclofenac (4 mg/kg) treatment significantly increased fall off time of motor co-ordination in rota rod test EtOH extract of B.prionitis leafs by using acto-photometer reported fluoxetine stimulant activity in mice as 91.93% while the test drug stimulated the animal only by 49.72%.[38]

Anti-inflammatory activity:-

The Anti-inflammatory activity of *Barleria prionitis* whole plant extract have also been investigated and documented against carrageenan-induced paw edema in rats.[39] A recent study showed that anti-inflammatory activity of extracts was clearly related to their inhibition of cyclooxygenase enzymes with subsequent inhibition of prostaglandin synthesis. More over; the flower extract was also documented with significant anti-inflammatory activity against Carrageenan and cotton pellet induced granuloma in rats.[40]

Antiviral activity:-

Two iridoid glycosides (i.e. 6-O-trans-p-coumaroyl-8-Oacetlshanzhiside methyl ester) and its cis isomer from B.prionitis were reported by Chen et al. (1998)55. These bioactive phytochemicals revealed the potent antiviral against respiratory Syncytial virus (RSV) with EC50 and IC50 values of 2.46 and 42.2 mg ml- 1, respectively.[41,42]

Anti-dental decay activity

Crude extract of B.prionitis Linn. reported good antimicrobial activity against dental decay pathogens. It was reported that MeOH extract of bark showed much more potent activity against oral pathogens like S. mutants, *S. aureus, Pseudomonas sp, Bacillus sp and C. albicans, S. cerevisiae*.[43]

Anti-diarrheal acyivity

Butanol fraction of B.prionitis leaves showed the anti-diarrheal activity. Iridoid rich fraction of butanol (BuOH or n(BuOH)) of leaf extract posses dose dependant anti-diarrhoeal activity at concentration of 25-100 mg/kg in rat against castor oil induced diarrhea.[44,45] The hepatic glutathione content and reduced hepaticlipid peroxidation in response to the hepatotoxicity in mice and rats.[45]

Anti-nociceptive activity:-

Extract of flower (200 mg/kg) increased analgesia-meter-induced force and exhibited resistance against pain. It also inhibited acetic acid induced pain as 30.6% where phenylbutazone (100 mg/kg) presented 34.6%.[46]

Antifungal activity:-

Acetone, ethanol, methanol extract of bark and amphotericin-B showed significant activity respectively against *Saccharomyces cerevisiae* (11.64±0.57, 11.31±0.57, 13.95±1 and 11.94±1 mm), Candida albinos strain 1 (13.65±0.57, 12.94±1, 15.31±0.57 and 13±0 mm) and C. albinos strain 2 (16±0, 11.31±0.57, 16.96±1 and 12.94±1 mm) in well diffusion method. [47]

Analgesic activity:-

The analgesic activity of *B.prionitis* flowers extract was reported using an Ugo Basile Analgesy meter induced artificial pain and acetic acid induced writhing models.[48,49] In vivo study showed that the flower extract dose dependently provided a significant increase in the analgesio-meter-induced force and exhibited significant resistance against pain in mice.[50,51] At a dose concentration of 50 mg/kg body weight, the flower extract provided statistically significant reduction of writhing by 5.24%.[52]

Hepatoprotective activity:-

The iridoid glycosides enriched fraction from hydro-ethanolic extract of leaves and stems of *B.prionitis* was reported to show significant hepatoprotection against carbon tetrachloride, galactosamine and paracetamol induced hepatotoxicity in mice and rats. The oral administration of iridoid fraction significantly reduced the hepatotoxin induced elevated levels of serum alanine aminotransferase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP), bilirubin and triglycerides in a dose dependant manner. The fraction was also increased.[53]

Wound healing:-

Wound healing is depicted and described in discrete timeline if physical attributes (phases) comprising the post trauma repair process. In undamaged skin, the epidermis (surface layer) and dermis (deeper layer) from protective barrier is broken, an orchestrated cascade of biochemical events is set into motion to repair the damage. The process is divided into predictable phases; blood clotting (haemostasis), inflammation, tissue growth (proliferation) and tissue remodeling (maturation).[54]

Bleeding time:-

Bleeding time is a crude test of hemostasis (the arrest or stopping of bleeding). It indicates how well platelets interact with blood vessels walls to form blood clots.[55]

Table 3:- Pharmacognostic properties of *Barleria prionitis*

Activity	Plants Part	Extract	Summary	Ref.
Anti-Helmintic Activity	**Whole plant**	Aqueous, ethanolic	Exhibited paralysis in lower doses	[44]
Anti-Ariyhmatic	**Leaf**	Ethyl acetate	Fraction (125 and 250 mg/kg)	[31,45]
Anti-Bacterial	**Bark**	Acetone, Ethanol, Methanol	Extracts were highly active against Bacillus sp. In agar well diffusion method was compared with ciprofloxacin	[46]
	Leaf	Pet. Ether, Chloroform	Least MIC was found to be 3.33 mg/ml by petroleum ether	
	Whole plant	Petroleum ether, Chloroform	Pet. Ether extract showed highest inhibition zone	
Anti-Hipertensive	**Leaf**	Methanol	Possessed profound activity after six week treatment in DOCA induced hypertensive rat model	[56]
Diuretic	**Flower**	Aqueous	Produced significantly diuresis and increased sodium elimination	[60]
Antioxident	**Aerial parts**	Not specified	Presence of glycoside displayed significant free radical scavenging activity	[35]
Antidiabetic	**Leaf**	Alcohol	At 200 mg/kg increased insulin and liver glycogen	[50,52]
	Root	Alcohol	Extracts (200 mg/kg) provided	[53]
Larvicial	**Leaf**	Acetone, Chloroform, Methanol	LC50 values were found to be 34.756, 31.351 and 28.577 mg/ml in acetone, chloroform and methanol extract	[59]
Antifertility	**Root**	Not specified	100 mg/rat/ day reduced 100% fertility of male rats	[54,55]
Cns Depressant	**Leaf**	Ethanol	Extract provided very significantly activity as 91.93% compared with fluoxetine stimulant drug	[31]
Anti-Inflammatory	**Flower**	Ethanol	Ethanol 200 mg/kg revealed 48.6% and 36.4% inhibition in induced paw edema and reduction in cotton pellet- induced granuloma in rat model	[57]
	Root	Aqueous	200 & 400 mg/kg presented 52.56% & 55.76% inhibition of induced paw edema rat	[58]
	Whole plant	Hydro alcohol	Extract (10 mg/kg) reduced rat mast cell degranulation	[38]
Antinociceptive	**Flower**	Ethanol	200 mg/kg increased analgesiometer induced force and pain resistance	[57]
Antifungal	**Bark**	Acetone, Ethanol, Methanol	Extract were highly active against C. albicans in agar well diffusion method while compared with amphotericin-B	[46]
Hepatoprotective	**Leaf & stem**	Ethanol Aqueous	Isolated iridoid afforded protection against carbon tetrachloride and paracetamol induced hepatotoxicity	[59]

COCLUSION

Due to presence of curative properties, medicinal plants always have got special emphasis from prehistoric era and current outgrowth of pharmacological industry cannot ignore its dominance for its unique phytochemicals containing infinity potential against numerous diseases. Consequently, tremendous research efforts are required to justify their previous established role commonly used by local practitioners and identify novel pharmacological and pharmacognostical features. Besides in numerous folk use, this review also illustrates its phytochemical profile as well as pharmacological augmentation which will be helpful for future researchers.

REFERENCES

1. E. India. (2017). International Seminar on "Multidisciplinary Approaches in Angiosperm Systematic". Systematics of Flowering Plants, 113-7.
2. Sunil KJ, Mukesh KD, Sanjeev D, Arti RV, Rao ChV. (2010). A comparative study on total phenolic content, reducing power and free radical scavenging activity of aerial parts of *Barleria prionitis*. International Journal of Phytomedicine, 2(2): 155-159.
3. Chetan BC, Ulka VS, Maheshwar H, Somnath B.(2010). Screening of in-vitro antibacterial assay of *Barleria prionitis* Linn. Journal of Herbal Medicine and Toxicology, 4(2): 197-200,15.
4. Alam MM, Anis, (1987). Ethnomedicinal uses of plant rowing in the Bulandshahr district of northen India J. Ethapharmacol, 19-24.
5. Amoo SO, Finnie JF, van Staden J. (2009). In vitro pharmacological evaluation of three Barleria species. J Ethnopharmacology, 121: 274-277.
6. Diwan PD, Gadhikar YA (2012). Assessment of phytochemical composition and Anibacterial activity of different extracts of *Barleria prionitis* leaves against oral microflora to impro dental hygiene. Asian J Pharm Clin Res., 5: 182-184.
7. Chavan C, Mulik S, Maheshwari C, Adnaik R, Patil P (2013). Screening of Antioxidant activity and phenolic content of whole plant of *Barleria prionitis* Linn. Int J Res Ayurveda Pharmacy 2: 1313-1319
8. Teotia P. Horticultural potential of *Barleria prionitis* L. in arid regions. J Econ Taxon Bot., 2000; 24(2): 251-253.
9. Ork. Sci. J. 9(9), (2016). Gautam SS, Navneet, Kumar S. The antibacterial and Phytochemical aspects of Violaodorata Linn. Extracts against respiratory tract pathogens. Proc. Natl. Acad. Sci., India B Biol. Sci., 2012; 82(4): 567-572.
10. Singh A, Pathak VM Navneet. (2016).Screening of antimicrobial potential of *Barleria prionitis* Linn. aerial parts against common respiratory tract pathogens. Int. J. Curr. Microbial. App. Sci., 5(7): 542-549.
11. Singh A and Navneet, (2011). Evaluation of antimicrobial potential and phytochemical assessment of CitrusmaximaBurm. Seeds extracts against respiratory tract pathogens. New York Science Journal 2016;9(9)
12. Dassanayake MD. A Revised Handbook to the Flora of Ceylon. pp987.
13. Banerjee D, Maji A, Banerji P. (2012). *Barleria prionitis* Linn: A review of its traditional Uses, phytochemistry, pharmacology and toxicity. Research Journal Phytochemistry, (6): 31-41.
14. Vasoya U. (2012). Pharmacognostical and physicochemical studies on the leaves of *Barleria prionitis* (L.). International Journal of Pharmaceutical Sciences and Research, 3(7): 2291.
15. Kamble MY, Pal SR. Shendage SM, Dixit GB, Chavan PD, Yadav US, Yadav SR. (2007). Promising Indian Barleria of Ornamental Potential. In: Underutilized and Underexploited Horticultural Crops, Peter, K. V. Ed. vol. 1. New India Publishing Agency, New Delhi, 144.
16. Kirtikar KR, Basu BD. (1999). Indian Medicinal Plants. Bishen Singh Mahendra Pal Singh, New Connaught Place, Dehradun, 1877- 1878.
17. Kaushik P, Dhiman AK. (2000). Medicinal Plants and Raw Drugs of India. Bishen Singh Mahendra Pal Singh, Shiva Offset press. Dehradun, India, 412.
18. Sharma P, Shrivastava B, Sharma GN, Jadhav, HR.(2013). Phytochemical and Ethnomedicinal Values of *Barleria prionitis* L.: An overview. Jour Harmo Res Pharm, 2(3): 190-9.
19. Jain S, Jain R, Singh (2009). Ethnobotanical survey of Sariska and Siliserh regions from Alwar district of Rajasthan, India. Ethnobotanical Leaflets, 1: 21.
20. Shendage SM, Yadav SR. (2010). Revision of the Genus Barleria (Acanthaceae) in India. Rheedea, 20: 81-130.
21. Dassanayake MD. (1998). A Revised Handbook to the Flora of Ceylon. vol. 12, CRC Press, Boca Raton, USA, 87.
22. Kamble MY, Pal SR. Shendage SM, Dixit GB, Chavan PD, Yadav US, Yadav SR. (2007). Promising Indian Barleria of Ornamental Potential. In: Underutilized and Underexploited Horticultural Crops, Peter, K. V. Ed. vol. 1. New India Publishing Agency, New Delhi, 144: 1.
23. Khare C (2004). Indian Herbal Remedies: Rational Western Therapy Ayurvedic and Other Traditional Usage, Botany. 1stEdn., Springer, New York, 93-94.
24. Aneja KR, Joshi R, Sharma C. (2013). Potency of *Barleria prionitis* L. Bark against Oral Diseases causing strains of Bacteria and Fungi of Clinical Origin. New York Sci. J., 3(201): 5-12.
25. Chavan CB, Hogadde MG, Bhinge SD, Kumbhar M, Tamboli A. (2010). In vitro anthelmintic activity of fruit extract of *Barleria prionitis* linn. against *Pheretima posthuma*. International journal of Pharmacy and Pharmaceutical sciences, 2(3): 49-50
26. Ata A, Kalhari KA, Samarasekera R. (2009). Chemical constituents of *Barleria prionitis* and their enzyme inhibitory and free radical scavenging activities; Phytochemistry Letters, 2(1): 37-40.

27. Perrin, D.D.; Amerigo, W.L. Editors, (1996)."Purification of Laboratory Chemicals," 4th Edition, Butterworth, New York.
28. Chetan B, Maheshwar G, Somnath D, Mahesh K, Ashpak T. (2010).*In vitro* anthelmintic activity of fruit extract of *Barleria prionitis* Linn. against Pheretima posthuma. International Journal of Pharmacy and Pharmaceutical Sciences, 2(3): 49-50.
29. Choudhary M, Kumar V, Gupta PK, Singh S. (2014). Anti-arthritic activity of *Barleria prionitis* Linn. leaves in acute and chronic models in Sprague Dawley rats. Bulletin of Faculty of Pharmacy, Cairo University, 52(2): 199-209.
30. Pushpan R, Nishteswar K, Kumari H.(2013). Antiarthritic natural medicine: Classical Ayurvedic and ethnomedical source. ASLMusculoskeletal Diseases, 1(1): 32.
31. Marya BH, Bothara SB. (2013). Investigation of Antihypertensive activity of Leaves of *Barleria prionitis* in doca salt inducedhypertensive rats. Int J Pharm Sci Rev Res, 18(2): 17-9.
32. S, Chittam K, Wagh R. (2011). Diuretic activity of *Barleria prionitis* Linn flower extract. International Journal of Drug Discovery and Herbal Research, 1(1): 20-1.
33. Khobragade CN, Bhande RM.(2012). *In vitro* antibacterial, membrane damage, antioxidant and anti-inflammatory activities of *Barleria prionitis* Linn. extract on UTI causing multidrug resistant E. coli. Int. J. Cur. Pharma Res.; 4(1): 64-69.
34. Reema, D., Pradeep, B., (2010). A study of the antidiabetic activity of *Barleria prionitis* Linn. Indian Journal of Pharmacology, 42(2): 70-73.
35. Jeyasankar A, Premalatha S, Krishnappa K, Elumalai K. (2013). Larvicidal activity of *Barleria prionitis*L (Acanthaceae) against Japanese encephalitis vector, *Culex tritaeniorhynchus* Giles (Diptera: Culicidae). Int. J. Interdiscip Res. Rev., 1(2): 116-20.
36. Gupta R, Kumar S, Dixit, VP, Dobhal MP. (2000). Antifertility studies of the root extract of the *Barleria prionitis* Linn. In male albino rats with special reference to testicular cell population. J. Ethano pharmacol, 70(2): 111-117.
37. Gangopadhyay A, Malakar J, Ghosh A, Pramanik G, Karmakar S. (2012).Comparative Antibacterial study of *Barleria prionitis* Linn. leaf extracts. International Journal of Pharmaceutical & Biological Archive. 13(2): 391-3.
38. Musale SB, Vaibhav Jagtap A, Minal Patil S, Chittam K, Wagh R.(2011). Diuretic activity of *Barleria prionitis* Linn flower extract. International Journal of Drug Discovery and Herbal Research, 1(1): 20-1.
39. Singh, B., Bani, S., Gupta, D.K., Chandan, B.K., Kaul, A.,(2003). Anti-inflammatory activity of „TAF" an active fraction from the plant *Barleria prionitis* Linn. Journal of Ethnopharmacology,85(2-3): 187-193.
40. Sunil, K.J., Mukesh, K.D., Sanjeeb, D., Arti, R.V., Vijayakumar, M., Chandana, V.R.,(2010). Evaluation offlower of *Barleria prionitis* for antiinflammatory and anti nociceptive activity. International Journal of3 Pharma and Bio Sciences, V1(2): 1-10.
41. Banerjee AK, Maji S, Mahapatra S, Banjeri P. (2012). *Barleria prionitis* Linn.: A Review of its Ttraditional uses, Phytochemistry, Pharmacology and Toxicity, Res. J. Phytochem, 6: 31-39
42. Chen JL, Blanc P, Stoddart CA, Bogan M,RozhonEJ. (1998). New iridoids from the medicinal plant *Barleria prionitis* with potent activity against respiratory syncytial virus. J. Nat. Prod., 61: 1295-1297.
43. Aneja KR, Joshi R, Sharma C. Potency of *Barleria prionitis* L. (2013). Bark Extracts against Oral Diseases causing strains of Bacteria and Fungi of Clinical Origin. New York Sci. J., 3: 5-12.
44. Jaiswal SK, Dubey MK, Das S, Verma AR, Vijyakumar M, Rao CV. (2010). Evaluation of iridoid glycosides flower of *Barleria prionitis* for anti-inflammatory and anti-nociceptive activity. Int. J. Pharm. Biol. Sci. 1, 1-10.
45. Sunil KJ, Mukesh KD, Ajay KV, Sanjib D, Vijaykumar M, Chandana VR.(2010). Evaluation of iridoid glycosides from leave of *Barleria prionitis* as an anti-diarrhoeal activity: An Ethno pharmacological study. Int. J.Pharma. Sci. & Res., 2(3): 680-686.
46. Jaiswal SK, Dubey MK, Das S, Verma AR, Vijayakumar M, Rao CV. (2010). Evaluation of flower of *Barleria prionitis* for anti-inflammatory and anti-nociceptive activity. International Journal of Pharma and Bio Sciences, 1.29-35
47. Aneja KR, Joshi R, Sharma C.(2010). Potency of *Barleria prionitis* L. bark extracts against oral diseases causing strains of bacteria and fungi of clinical origin. New York Sci J., 3: 5-12.
48. KapoorA, Shukla S, Kaur R, Kumar R. (2014).Preliminary phytochemical screening and antioxidant activity of whole plant of *Barleria prionitis* Linn. Int. J. Adv. Pharma, Biol. & Chem., 3(2): 410-419.
49. Sharma P, Sharma GN, Srivastava B, Jadhav HR. Evaluation of Antioxidant Potential of Barleria prionits leaf and stem. Ame J. Phytomed Clin. Thera, 2014; 2(11): 1177-1186.
50. Chetan C, Suraj M, Maheshwari C, Rahul A, Priyanka P. (2011)."Screening of antioxidant activity and total phenolic content of whole plant of *Barleria prionitis*." Linn. Int. J.Res. Ayurveda Pharma, 2: 1313-1319.
51. Kumar U, Ahmed F, Khanojia P, Kukreja K, Kumari S, Bhat RA. (2013).Exploration of Antioxidant and Antibacterial Activity of *Barleria prionitis* Linn.Int. J. Curr. Microbiol. App. Sci., 2(12): 585-591.
52. Jaiswal SK, Dubey MK, Das S, Verma AR, Vijyakumar M and Rao CV. (2010). Evaluation of flower of *Barleria prionitis* for anti-inflammatory and anti-nociceptive activity. Int. J. Pharm. Biol. Sci., 1: 1-10.
53. Singh B, Chandan BK, Prabhakar A, Taneja SC, Singh J, Qazi GN (2005). Chemistry and hepatoprotective activity of an active fraction from *Barleria prionitis* Linn. in experimental animals. Phtother. Res., 19: 391-404.
54. Dheer, R, Bhatnagar P. (2011). A study of the antidiabetic activity of *Barleria prionitis* Linn. Indian J. Pharmacol, 42(2): 70-73.
55. Choudhary M, Kumar V, Gupta PK, Singh S. (2014). Anti-arthritic activity of *Barleria prionitis*Linn. Leaves in Acute and Chronic Models in Sprague Dawley rats. Bull. Faculty Pharma., Cairo University, 52(2): 199-209.
56. Marya BH, Bothara SB. (2013). Investigation of Antihypertensive activity of Leaves of*Barleria prionitis* in doca salt induced hypertensive rats. Int J Pharm Sci Rev Res. 18(2):17-9.

57. Jaiswal SK, Dubey MK, Das S, Verma AR, Vijayakumar M, Rao CV.(2010).Evaluation of flower of *Barleria prionitis* for anti-inflammatory and anti-nociceptive activity. International Journal of Pharma and Bio Sciences; 2 (1). 27-34.
58. Khadse C, Kakde R. (2011).Anti-inflammatory activity of aqueous extract fractions of *Barleria prionitis* L. roots. Asian J Plant Sci Res. 1(2):63-8.
59. Singh B, Chandan B, Prabhakar A, Taneja S, Singh J, Qazi G. (2005). Chemistry and hepatoprotective activity of an active fraction from *Barleria prionitis* Linn. In experimental animals. Phytotherapy Research. 19(5):391-404.
60. Musale SB, Vaibhav Jagtap A, Minal Patil S, Chittam K, Wagh R. (2011). Diuretic activity of *Barleria prionitis* Linn flower extract. International Journal of Drug Discovery and Herbal Research. 1(1):20-1.

CITATION OF THIS ARTICLE

S. S. Shinde, H. L. Tare, N. S. Deshmukh, S. R. Chaudhari, G. D. Ghangale, B. V. Udugade. Pharmacognosy, Phytochemistry and Traditional Uses: *Barleria prionitis*. Bull. Env. Pharmacol. Life Sci., Vol 9[4] March 2020 : 150-158