IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Review on Pharmacological Activity Of Bauhinia Purpurea L.Flower.

Swati wakchoure*, Sachin Jadhav 2 ,Puja Raut[3], Bharti Tribhuvne[4], Bhagyashri Vivek Chaudhari 5.

Department of Pharmacognosy.

SSJCOP,Asangaon,Thane Maharashtra (MH)421601*,Dr Ithape Institute of pharmacy,Sangamner[1],SSJCOP Asangaon,Thane[2]

Corresponding Authors

Swati wakchoure

ABSTRACT

Herbal medicines are nature's gift to human beings, enabling human beings to live a healthy and disease-free life. It plays an important role in protecting our health. India has one of the most diverse medical cultures in the world and the herbal medicine industry is part of ancient traditions that are still revered today. Medicinal plants are considered safer. In my country, there are more than 2,000 species of medicinal plants that have been confirmed. Bauhinia. (Salicaceae; butterfly bush) is an important medicinal plant with a variety of traditional uses.

This article deals in detail with the phytopharmacological properties of B. purpurea, trying to provide directions for further research.

Keywords: Phytochemical screening, Medicinal plant, Bauhinia purpurea L.Flower.

INTRODUCTION

The widely known redbud genus consists of trees and shrubs that grow in warm climates. Rare in most parts of the south, tree 5-7 m tall in deciduous forests, often planted in roadside gardens for its large purple panicles. Leaves 10 to 20 cm long and wide, rounded, alternate, bilobed at the base and at the apex. The flowers are striking, pink and fragrant, with five petals. The fruit is a 30 cm long pod containing 12 to 16 seeds as long as peas.

Blooms and fruits in December.

B. Aliases/common names of plants such as Redbud, Purple Orchid, Mandaram, etc. Native to southern China (including Hong Kong) and Southeast Asia, purpurea is present throughout India, at 1300 meters altitude in the Himalayas. Different species of redbuds viz. b.

reticulata, B. rufescens and B. variegata have traditionally been used in Africa to treat roundworm infections, conjunctivitis, anthrax, ulcers, dysentery, blood poisoning, leprosy, tuberculosis and diseases skin, while in India the bark of B. variegata extract is used to treat cancer. The leaves are used as food and fodder during lean seasons, the bark is used as a fiber, dye and tannin extract, and its decoction is used as an anthelmintic and remedy for diarrhoea.

A root decoction is used to expel gas, flatulence and pain in the stomach and intestines. A decoction of the flowers is used as an ointment for boils and abscesses. Bauhinia root bark. Contains flavonoid glycosides. This study aimed to investigate and evaluate the use of B.

Purpura is used in traditional medicine to repel vermin.

Morphological character

Botanical name :- Bauhinia purpurea

Common name :- Purple bauhinia,orchid tree,camel's foot tree,butterfly tree

Hindi :- Kota , raktakanchan , khairwal , karar , kanchan

Malay :- Tapak kuda

Nepali :- Tanki

Spanish :- Pie de cabra

Thai :- Sieowaan,sieo dok daeng

Trade name. :- Kachan,karar,khairwal

Scientific classification:

Kingdom, :- Plantae

Clade :- Tracheophyte

Division :- Angiosperms

Order :- Fabales

Family :- Fabaceae

Genus: - Bauhinia

Species: - B. purpurea

Cultivation and collection

Propagation of Bauhinia species is from seeds or cuttings. They thrive in alkaline soils and do not tolerate salty conditions. Full sun exposure is preferred but they can be grown under partial sun. Generous watering is needed during summer, moderate moisture required in winter.

Cultivation and Harvesting Bauhinia can be propagated naturally by seed under suitable conditions, while artificial propagation adopts the method of leaving heaps or plants. The seeds are sown directly.

Branched cuttings usually have difficulty rooting, but root well after auxin applications in August, November and February. Live streams can be arranged in rows at a distance of about 3m. Germination begins about a week after the monsoon rains, ensuring the soil is well saturated. The whole plant should be transplanted together with the clod. When transplanting in July-August, the previous year's seeds were sown in March-April (Mali et al., 2009) Ornamental plants are propagated by seeds, planting stems and cuttings. Seeds are sown in March-April. The seedlings are then planted in July-August. Their germination occurs at the onset of the monsoons.

In vitro regeneration observed in Bauhinia node explants from mature trees. Optimal capture was obtained in 15 to 20 days on a medium supplemented with 13.3 µm of IBA. Single shoots with 3-4 nodes started to root when transferred to MS medium with 4.9 µm IBA within 45 days (Chandra et al.

, 2007) Flower: vasantha rutu. Flowering: February to April. Fruit: May to June (Chandra et al., 2007

Table.1 Chemical constituent

Plant parts	**Chemical constitutents**
Plant	*Bauhinia. Purpurea*l linn contain major class of secondary metabolites are glycosides, flavonoids, saponins, triterpenoids, phenolic compounds, oxepins, fatty acids and phytosterols.
Leaves	Lupeol, stigmasterol, lanosterol, ergosterol, beta-tocopherol, phytol, palmitic acid, methyl palmitate, octadecadienoic acid and octadecanoic acid.
Steam bark	5,7-dihydroxy in 5,7-dimethoxyflavanone-4-O-a-L-rhamnopyrosyl-ß-D-glycopyranoside, Kaempferol-3-glucoside, lupeol
Seeds	Proteins, fatty oils containing oleic, linoleic, palmitic and stearic acids.
Flowers	Peanut, Malvi, Peony in Kaempferol
Root	Flavanol-glycosides

Table.2 Uses

Biological Activity	Plant Part	Extract/Formulation	Dose	Model/Organism/Cell lines
Anti-diabetic	Bark	Methanolic	100mg/kg	STZ induced diabetes in rats alloxan-induce diabetes assayin mice
Anti-malarial	Root	Dichloromethan	5.8-11.2 micromolar	Against *plasmodium falciparum*
Cytotoxic	Leaves, bark,roots	Dichloromethane	10.5-72.3 micromolar	Brine shrimp lethality method of bioass, KB and BC cell lines
Anti-malarial	Root	Dichloromethan	5.8-11.2 micromolar	Against *plasmodium falciparum*
Antifungal	Root	Dichloromethane	49.6-130.1 micromolar	Against *candida albicans* employing a colorimetric method
Anti-mycobacterium	Root	Dichloromethane	-----	Against mycobacteriam tuberculosis H37Ra using the micro plate Alamar Blue assay method
Amelioration of hyperthyroidism	Leaves	Ethanolic	100 mg per kg	LT- induced hyperthyroid animals
Antimicrobial	Leaves	Aqueous organic	----	Application of the disc diffusion method against the microorganisms Bacillus subtilis, Staphylococcus aureus, Salmonella typhi, Escherichia coli, Pseudomonas aeruginosa and Candida albicans
Anti-diarrheal	Leaves	Ethanolic	100,200 and 300 mg/kg	Castor oil induced diarrhea and gastrointestinal motility test by using charcoal meal
Fibrolytic	Bark	Powder	6 g/kg for 7days	In chronic mastitis with induced fibrosis
Antiepileptic	Leaves	Ethanolic	100,250 and 500 mg/kg i.p	using PTZ (pentylenetetrazole induced seizure) and MEZ (maximum electric shock) model
Anti-depressant	Leaves	Ethanolic	100,250 and 500mg/kg.i.p	Using forced swim test and tail suspension test

Anti-inflammatory and anti-arthritic	Stem bark	Hydro-alcoholic	100 and 200 mg per kg	using Carrageenan induced paw edema and Adjuvant induced arthritis model
Antinoceptive, Anti-Inflammatory and Antipyretic activity	Leaves	ChloroformAqueous	6, 30 and 60 mg/kg	formalin test, abdominal constriction and eddy's hot plate method and carrageenan induced paw edema method, brewer's yeast induced pyrexia test
Nephro-protective	Unripe pod / leaves	Ethanolic	300 mg per kg	Nephrotoxicity caused by gentamicin
Wound healing	Leaves	Methanol and chloroform extract	100-500 mg per kg	excision wound, burn, dead space wound and incision wound models
Antioxidant	Leaves	Aqueous	254 mg/g and 143-138mg/g	by Nitric oxide scavenging assay, Reducing power method
Anti-ulcer	Leaves	Methanolic	100,500 and 1000 mg/kg	Inducing gastric ulcer with indomethacin, absolute ethanol and pylorus ligation.
Anti-hyperlipidemic	Unripe pods and dried leaves	Ethanolic	300 mg/kg/day	Induced with high fat diet
Anti-cancer	Roots,stems,pods and leaves	Bioactive compound	----	Inhibit P388 cancer cell line
Anti-Obesity	Bark	Methanolic	200and 400mg/kg	Induced with high fat diet
Hepatoprotective	Leaves	Methanolic	50,250 and 500 mg/kg	Induced by oral administration of paracetamol

DOSAGE

Twakchurnam- 4 grams

Pushpachurnam- 2 grams

Decoction- 50-100 ml (Chandra et al., 2007).

Stem bark powder- 3-6 grams Decoction- 40-80 ml Flower juice- 10-20 ml

Flower juice for decoction- 20-30 ml (Chandra et al., 2007).

Kanchanara guggulu- ½ Tula (Khare, 2007).

Bark powder- 2-4 masha.

Pushppa powder- 1-2 masha (Kumar, 2013).

Pharmacological Activity Bahunia Purpurea L.Flower

Antihelmintic activity:

The extracts of flower of *Bauhinia purpurea* L. exhibits moderate to significant anthelmintic activity at the dose of 50-250 µg/ml. All the extracts were tested for anthelmintic activity, piperazine citrate was employed as reference standard. It has been observed that all the tested extracts showed mild to moderate anthelmintic activity. Extracts EtOAc and MeOH extract of flower of *Bauhinia purpurea* L. was found to be most active agents among the extracts. Also aqueous extract of flower of *Bauhinia purpurea* L. was showing good anthelmintic activity.

Antimalarial, Antifungal and Antitubercular activity:

Root extract (B. purpurea) led to the isolation of eleven novel compounds named as Dihydrodibenoxepins and dihydrobenzofuran compounds. Dihydrodibenoxepins was evaluated and showed marked Anti-malarial with inhibitory concentration range 5.8-11.2 micromolar. However oxepins and dihydrobenzofuran showed potent Anti-fungal activity with inhibitory concentration range 49.6-130.1 micromolar. Antimycobacterium activity of root extract of B. purpurea was investigated against Mycobacterium tuberculosis H37Ra using the micro plate Alamar Blue assay method. The extract and its isolated bioactive compounds possessed profound antimycobacterium potential comparable with standard drug Isoniazid and kanamycin sulphate.

Antimicrobial activity: The organic and antibacterial activity of aqueous and organic extracts of B. purpurea against Bacillus subtilis, Staphylococcus aureus, Salmonella typhi, Escherichia coli, Pseudomonas aeruginosa and Candida albicans was investigated using the disk diffusion method. The methanolic extract of B. Purpurea has potent inhibitory activity.

Anti-diarrheal potential: Ethanolic extract of the leaves of B. purpurea was investigated for its anti-diarrheal potential in rats as experimental animal by using castor oil induced diarrhea and gastrointestinal motility test by using charcoal meal. The extracts at the doses of 100, 200, and 300 mg/kg were reported to possessed significant activity compared with the standard in both the models. The concluding remark of the study was the plant established its folklore claim

Antiepileptic (Anticonvulsant): The antiepileptic activity of ethanol extracts of B. purpurea in Swiss albino mice was studied using different doses of PTZ (pentylenetetrazolium-induced seizures) and MEZ (maximal electric shock) models. The pronounced anticonvulsant activity was supported by a significant reduction in the duration of the various stages of epilepsy (eg, flexion, extensor, convulsion and coma phases).

Anti-Depressant activity: B. purpurea ethanolic leaves extract was investigated for antidepressant potential in Swiss Albino mice using forced swim test (FST) and tail suspension test (TST). Ethanol extract at the dose 100, 250 and 500 mg per kg and duration of immobility and mobility was evaluated for 4 minutes. Extract at 500 mg per kg when administered in mice produced fall in immobility time in TST and FST models. Action was reported comparable with standard antidepressant drug Imipramine.

Anti-inflammatory and Anti-arthritic activity: Hydroalcoholic extract (stem bark) of B. purpurea was investigated for anti-inflammatory and antiartthritic activity on adult albino wistar rats using Carrageenan induced paw edema and Adjuvant induced arthritis model respectively. Rats and compared with standard lipid lowering drug atorvastatin. Hyperlipidemia was induced with high fat diet containing cholesterol, sodium

cholate and coconut oil mixed with animal feed. On administering the extract as 300mg/kg/day orally for 30 days, authors reported modest increase in body weight accompanied by significant rise in serum HDL-C level, decrease in Total Cholesterol, LDL and Triglycerides level. Atherogenic Index, an important indicator of Congestive Heart Disease was also lowered with this dose.

Anti-cancer activity: In significant studies, four new components were isolated from B. purpurea roots, stems, pods and leaves, named bauhinia statins 1 to 4, chemically identified as dibenzo [b,f]oxepins (2a, 3-5). These four compounds were had significant growth inhibition against human cancer cell lines. Similarly, Bauhinia statins 1-(2a) indicated potential to inhibit P388 cancer cell line proliferation. The structure of new statins was established with Mass Spectroscopy and 2D NMR.

Hepatoprotective activity: A study for hepatoprotective activity of B. purpurea employed methanolic extract of shade dried leaves on rats. Animals were divided into 6 groups designated as group I (normal control), group II (negative control),group III (positive control) and group IV,V,VI as pre-treatment group with 50 mg, 250 mg and 500 mg per kg body weight given orally, once daily for 7 days. Hepatotoxicity was induced by oral administration of paracetamol. Biochemical evaluation revealed decrease in ALT (alanine aminotransferase), AST (aspartate aminotranseferase) and alkaline phosphatase on treatment with extract and silymarin. Histopathologically, methanolic extract of B. purpurea reversed toxic effect of paracetamol, namely necrosis, inflammation and hemorrhage.

Anti-Obesity activity: Methanolic extract of B. purpurea bark was administered orally as 200mg/kg and 400mg/kg body weight to Male Wistar rats on high fat diet for 6 weeks. Sibutramine, the standa decreased body weight of obese rats by 30%, while 28 % and 24% was weight reduction observed in rats due to 400mg/kg and 200 mg/kg body weight extract dose. At the end of treatment period, total cholesterol, triglycerides, low density lipoprotein level in blood serum decreased notably with parallel rise in high density lipoprotein level.

Fibrolytic Effect: B. purpurea bark powder on daily administration at the dose of 6 g/kg for 7 days was investigated for its fibrolytic effect in chronic mastitis with induced fibrosis. Experimental goats were divided into four groups, I and III animal group received ceftriaxone at 20 mg/kg intravenously, whereas group II and IV goats were orally administered with B. purpurea bark powder. Disease was reported to induce by using intramammary inoculation of coagulase positive Staphylococcus aureus in group III and IV goats. The authors concluded with the study that daily administration of bark powder enhanced the bioavailability of ceftriaxone due to its fibrolytic effect.

Amelioration of Hyperthyroidism: B. purpurea ethanolic leaves extract was investigated in an albino wistar rat model. LT4 inducing agent (0.5 miligram per kilogram) administered for 12 days exhibit rise in serum level of triiodothyronine, thyroxine concentration and decrease in thyroid stimulating hormone concentration. Concurrent administration of B. purpurea (100 mg per kg) extract to LT-induced hyperthyroid animals reversed all changes and supported to its potential in management of hyperthyroidism. Efficacy was reported as effective and comparable to that of reference drug Propylthiouracil [15]. Also, daily administration of B. purpurea at dose 2.5 mg/kg for 20 days increased serum T4 concentration and O2 consumption suggesting its role in Hyperthyroidism

Anti-diabetic activity: Intraperitoneal administration of Streptozotocin (50 mg/kg) led to rise in levels of fasting blood glucose and maintained for 2 weeks. Daily administration of methanolic extract of B. purpurea at

the dose of 100mg/kg produced a dose dependent decrease in blood glucose level [11] . The antidiabetic potential of different extract of stem and bark was also evaluated using Alloxan-induced diabetes assay in mice. Methanolic extract at the dose of 200 mg/kg was found to possessed significant anti-diabetic activity

Cytotoxic activity: Study investigated different plant parts like leaves, bark and roots showed cytotoxic activity by implementing Brine shrimp lethality method of bioassay [13]. Bioactive compounds isolated from B. purpurea showed cytotoxic activity towards KB and BC cell lines with significant Inhibitory concentration value

CONCLUSION

In developing countries like India, herbal formulas form the basis of primary care for about 80% of the population as they are more compatible with the human body and have less side effects. From our results, it can be seen that leaves and flowers of Bauhinia sinensis contain chemical constituents and nutrients in qualitative and quantitative tests. Flowers contain higher concentrations of protein. However, the carbohydrate and amino acid content of the leaves is relatively high. This suggests it may have therapeutic potential to help maintain good health.

Kanchnara (Bauhinia purpurea Linn.) is a medicinal plant with the potential to cure many diseases. We discuss pharmacological activity, traditions, medicinal uses, culture, collection, chemical composition and history. The important chemical components of Bauhinia are flavonoids, glycosides, alkaloids, tannins and terpenoids, which determine the different pharmacological properties of Bauhinia.

In this review article, we collected information on the botanical, pharmacognostic, ethnobotanical, phytochemical and pharmacological literature on Bauhinia.

ACKNOWLEDGEMENT: Nil

RESULT AND DISCUSSION

Review studies on B. purpurea reveal that the plant has great biological potential. It is strongly believed that the detailed information on the phytochemicals and various biological properties of the extract presented in this review can provide detailed evidence for the use of this plant in different medicines. The phytochemical variation and availability of medicinal value of B. purpurea depends on geographic location.

Even today, plants are almost the only source of medicine for most people in the world. Therefore, providing effective, safe and inexpensive drugs remains a challenge for scientists, especially in rural areas. The quantification and pharmacological characterization of these Bauhinia species and their individual botanical constituents based on in vitro, in vivo studies and clinical trials should be further investigated.

REFERENCES

1. Sunset Western Garden Book, OED: "Bauhinia", 1995; 606–607.

2. Sinou C, Forest F, Lewis GP, Bruneau A "The genus Bauhinia s.l. (Leguminosae): a phylogeny based on the plastid trnL–trnF region". Botany, 2009; 87(10): 947–960. doi: 10.1139/B09-065.

3. The Legume Phylogeny Working Group (LPWG). "A new subfamily classification of the Leguminosae based on a taxonomically comprehensive phylogeny". Taxon, 2017; 66(1): 44–77. doi:10.12705/661.3

4. "Genus: Bauhinia L." Germplasm Resources Information Network. United States Department of Agriculture. 2007-03-29. Archived from the original on 2012-05-03. Retrieved, 2010; 12: 06.

5. Wunderlin RP. "Reorganization of the Cercideae (Fabaceae: Caesalpinioideae)" (PDF). Phytoneuron, 2010; 48: 1–5.

6. Chopra RN, Nayar SL and Chopra IC: Glossary of Indian Medicinal Plants. CSIR, New Delhi, 1996; ISBN: 8172361262. www.wjpr.net | Vol 10, Issue 1, 2021. | ISO 9001:2015 Certified Journal | Jinaan et al. World Journal of Pharmaceutical Research 215

7. Rajaram N and Janardranan K: Chemical composition and nutritional potential of the tribal pulse, Bauhinia purpurea, B. racemosa and B. vahlii. J Sci Food Agric, 1991; 55: 423- 431.

8. Patil VK: Prospect and potential of medicinal and aromatic plant in Chattisgarh. IG Agriculture University, Raipur, India, 2003; 17.

9. Kurjan JC: Plant that Heal. Oriental Watchman Publishing House, Pune, 2004; 31.

10. Wassel M, abdel-Wahab SM and Ammar NM: Constituents of the essential oils from Bauhinia variegate L. and Bauhinia purpurea L. flowers. Sci Pharm, 1996; 54: 357- 361.

11. Jones DT and German P: Flora of Malaysia. Oxford University Press, Oxford, 1993.

12. Dilip kumar chanchal an update on ayurvedic herb kachhnar (bauhinia purpurea linn.)- a review, ijp, 2015; 2: 8.

13. Krishnaveni Marimuthu et.al., Int. J. Pharm. Sci. Rev. Res., 2014; 29(2), 14: 72-76.

14. Pacific Island Ecosystems at Risk: Bauhinia acuminata. The Ayurvedic Pharmacopoeia, 1: 73.

15. World Conservation Monitoring Centre "Bauhinia augusti". List of threatened species. IUCN, 1998:e. T36816A10018509. doi: 10. 2305/IUCN.UK. 1998. RLTS. T36816A10018509. en., 2017; 16.

16. Hilton-Taylor, C. & Cloete, E. "Bauhinia bowkeri". The IUCN Red List of Threatened Species. IUCN, 1998. e.T30342A9538595. doi:10.2305/IUCN.UK.1998.RLTS.T30342A9538595.en.

17. Retrieved December Media related to Bauhinia bowkeri at Wikimedia Commons "Bauhinia divaricata". Germplasm Resources Information, 2017; 20.

18. Network (GRIN). Agricultural Research Service (ARS), United States Department of Agriculture (USDA). Retrieved September, 2013; 28.

19. Neill, D. & Pitman, N. "Bauhinia flagelliflora". The IUCN Red List of Threatened Species. IUCN, 2004. e.T45203A10985047. doi:10.2305/IUCN.UK.2004.RLTS.T45203A10985047.en., 2017; 20.

20. Edward F. Gilman and Dennis G. Watson "Bauhinia forficata: Brazilian Orchid-Tree". University of Florida.", 1993.

21. Bauhinia galpinii N.E.Br". The Plant List Version, 2010; 1: 10.

22. Neill, D. & Pitman, N. "Bauhinia haughtii". The IUCN Red List of Threatened Species. IUCN, 2004. e.T45204A10985134. doi:10.2305/IUCN.UK.2004.RLTS.T45204A10985134.en., 2017; 20.

23. World Conservation Monitoring Centre (1998). "Bauhinia integerrima". The IUCN Red List of Threatened Species. IUCN. 1998: e.T37976A10085038. doi:10.2305/IUCN.UK.1998.RLTS.T37976A10085038.en, 2017; 16. www.wjpr.net | Vol 10, Issue 1, 2021. | ISO 9001:2015 Certified Journal | Jinaan et al. World Journal of Pharmaceutical Research 216

24. CAMP Workshop, Kenya 1998. Bauhinia mombassae. 2006 IUCN Red List of Threatened Species. Archived June 27, 2014, at the Wayback Machine Downloaded on, 2007; 19.

25. Forest Starr and Kim Starr "New Plant Records from Midway Atoll, Maui, and Kaho'olawe" (PDF). Bishop

Museum Occasional Papers, 2011; 110: 23–35.

26. "Bauhinia petersiana, Kalahari White Bauhinia, Koffiebeesklou -". TopTropicals.com rare plants for home and garden, 2017; 08: 04.

27. Neill, D. & Pitman, N. (2004). "Bauhinia pichinchensis". The IUCN Red List of Threatened Species. IUCN. 2004: e.T45205A10985230. doi:10.2305/IUCN.UK.2004.RLTS.T45205A10985230.en, 2017; 16.

28. Mitré, M. (1998). "Bauhinia picta". The IUCN Red List ofThreatened Species. IUCN. 1998: e.T37851A10081741. doi: 10. 2305/IUCN.UK. 1998. RLTS.T37851A10081741. en., 2017; 19.

29. Phalak, Paresh Prashant. "The Real Gold", 2012; 19. http://www.worldagroforestry.org/af/treedb/AFTPDFS/Bauhinia_rufescens.pdf.

30. "Bauhinia seleriana Harms | Plants of the World Online | Kew Science". Plants of the World Online. Retrieved, 2020; 07: 03.

31. Neill, D. & Pitman, N. (2004). "Bauhinia seminarioi". The IUCN Red List of Threatened Species. IUCN, 2004. e. T45206A10985321. doi:10.2305/IUCN.UK.2004. RLTS. T45206A10985321. en, 2017; 20.

32. Neill, D. & Pitman, N. "Bauhinia stenantha". The IUCN Red List of Threatened Species. IUCN. 2004: e.T45207A10985409. doi:10.2305/IUCN.UK.2004.RLTS.T45207A10985409.en, 2017; 20.

33. "PlantFiles: Yellow Bauhinia, Yellow Bell Orchid Tree". Dave's Garden. Retrieved, 2017; 08: 04.