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AN UPDATE ON AYURVEDIC HERB KACHHNAR (*BAUHINIA PURPUREA* LINN.)- A REVIEW

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ABSTRACT: *Bauhinia Purpurea* was commonly known as a purple orchid tree, belonging to the family Caesalpinaceae, sparingly grown in India. The use of natural products as medicinal agents presumably predates the earliest recorded history. It is a species of flowering plant is used in several traditional medicine system to cure various diseases. This plant has been known to possess antibacterial, antidiabetic, analgesic, anti-inflammatory, anti-diarrheal, anticancerous, nephroprotective and thyroid hormone regulating activity. A wide range of active chemical compound including 5,6-Dihydroxy-7-methoxyflavone 6-O-β-D xylopyrano- Side, bis[3,4-dihydroxy-6-methoxy-7,8-furano-5,6-monomethylalloxy]-5-C-5-biflavonyl and (4-hydroxy-7-methyl 3-C-α-L-rhamnopyranosy) - 5 - C – 5 -(4-hydroxy-7-methyl) - 3 – C - α-D-glucopyranosyl], biflavonoid, bibenzyls, dibenzoxepins, mixture of phytol fatty esters, lutein, β-sitosterol, isoquercitrin and astragalin etc. The present review discusses medicinal properties, Biological activity, Phytochemistry and Pharmacology of *Bauhinia Purpurea*.

INTRODUCTION: Various Medicinal plants have been used for centuries as remedies for the disease because they contain components of therapeutic values. According to the WHO, 80% of the world population continues to rely mainly on traditional medicine for their health care[1]. The well- known and well-established genus Bauhinia comprises of trees and shrubs that grow in a warm climate. It is rare in the southernmost district, 5-7 m tall tree in deciduous forests which is often planted in gardens along the roadside for its large purple beat flowers. The leaves are 10-20 cm long and broad, rounded, alternate and bilobed at the base and apex.

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The flower is conspicuous, pink and fragrant, with five petals. The fruit is a pod 30 cm long, containing 12- 16 seeds and have long seed as a pea. Flowers and fruit appear in December [2].

Plant Profile: It is small to medium-sized deciduous tree growing up to 17 m tall. The leaves are 7.5-15 cm long rather than longer than broad, cleft about halfway down into two acute or rounded bilobed very minutely pubescent beneath when young, base usually cordate, 9-11 nerved, petiole 2.25-3.8 cm long. The bark is ashy to dark brown pubescent.

The flowers are conspicuous, pink and fragrant with five petals. Pedicels 5-13mm long, stout, tomentose, bract and bracteoles small tomentose, deltoid petals 3.8 to 5cm long oblanceolate long clawed, spreading veined. Stamens usually three fertile, other reduced to antherless filaments. Ovary downy, long-stalked; Style long; Stigma large, oblique [3].

FIG. 1: LEAVES OF *BAUHINIA PURPUREA*

Indian Name: In India, it is known by its vernacular name, the most commonly used are

English : Butterfly Tree

Hindi : Kaniar

Kannada : Devakanchan

Marathi : Raktachandan

Tamil : Nilattiruvatti

Bengali : Koiral

Assamese : Og-yok [4]

Geographical Distribution: *Bauhinia Purpurea* is native to China and found throughout India, ascending to an altitude of 1300 m in the Himalayan [5]. *B. purpurea* is a moderate evergreen tree in the sub-Himalayan region and western track of India, and often its leaves are used as fodder during the lean period [6]. The genus Bauhinia, consisting of 300 species [7]. In the United State of America, the tree grows in Hawaii, coastal California, southern Texas and southwest Florida.

Medicinal Uses: The young pods and mature seeds of kachnar are known to be cooked and eaten by tribes such as the Kathkors and Gondas of India [8]. Species of Bauhinia are rich in polyphenolics and are known for its medicinal properties [9]. The bark of the plant is used as an astringent in the treatment of diarrhea. Its decoctions are recommended for ulcers as a useful wash solution. The bark or root and flower mixture with boiled rice water is used as maturant for boil and abscesses [10]. The decoction of the flower is worked as a laxative [11]. There is no documentation on its traditional use to treat disease among to treat, ailments like glandular swellings, skin disease, ulcer, diarrhea, stomach tumor, and wounds[12].

Ethnomedicinal Use of Different Parts of *Bauhinia Purpurea* Linn.:

Whole Plant: The whole plant is used in dropsy, pain, rheumatism, convulsions, and septicemia[13].

Flower: The Flower bud and flower fried in ghee are reported to be given to patients suffering from dysentery [14].

Bark: The concentrated decoction of the bark is used to treat lymphadenitis by tribal people of Jalgaon District [15]. The decoction of stem bark orally twice a day is very effective in asthma and other respiratory disorder as an anti-inflammatory agent [16]. Also, bark juice is useful in menstruation trouble and with honey is taken orally against leucorrhea [17].

Root: Root bark is mixed with curd and used in hemorrhoids. Its paste with dried ginger applied internally in the treatment of goiter. The root is carminative [18]. Infusion of a small piece of root is used for the treatment of white spot on race [19].

Phytochemistry of *Bauhinia Purpurea:* *Bauhinia purpurea* contain the major class of secondary metabolites is glycosides, flavonoids, saponins, triterpenoids, phenolic compounds, oxepins, fatty acids, and phytosterols. From the ethanolic extract of the whole plants of *B.Purpurea*, two new oxepins named bauhiniastatins 1 and 2 have been

isolated and the ethanolic extract of root provides bauhiniastatins 1, 2, 3 pacharin **Fig. 2** exhibit significant growth inhibition against a minipanel of human cancer cell lines [20]. The structure has been established by chemical evidence and spectroscopy methods. A novel flavones glycoside, 5,6-dihydroxy-7-methoxyflavone 6-*O*-b-D-xylopyranoside **Fig. 3** was isolated from the chloroform-soluble fraction of the ethanolic extract of *B. Purpurea* stems [21].

Three glycerol derivatives and 6-butyl-3-hydroxyflavone derivatives are 2, 3-dihydroxypropyl oleate, 2, 3 dihydroxypropyl linoleate, 2, 3-dihydroxypropyl 16-hydroxy-decanoate and 6-butyl-3-hydroxyflavone, 6-(3"-oxobutyl)-taxifolin **Fig. 4** respectively isolated from methalonic extract of heartwood of *B. Purpurea* [22].

The two new dimeric flavonoids namely bis [3', 4'-dihydroxy-6-methoxy - 7, 8 - furano - 5', 6'-monomethylalloxy]-5- C - 5 - biflavonyl and (4'hydroxy-7-methyl 3- C-α-rhamnopyranose)-5-C-5-(4'-hydroxy-7- methyl - 3 – C – α - D-glucopyranosyl) bioflavonoid **Fig. 5** with protein precipitating properties obtained from 70% aq. Acetone extract of *B. purpurea* leaves [23]. The leaves of B. purpurea also afforded a mixture of phytol fatty esters, leutin and β-sitosterol **Fig. 6** [24]. The petroleum ether fraction of ethanolic extract (95%) of *B. purpurea* leaf gave α- amyrin caprylate on successive column chromatography with petroleum ether (60-80º) and chloroform which gives Liebermann-Burchard test of triterpene. The compound is characterized by spectral analysis [25]. In flower, volatile oils of both B. purpurea and *B. variegata* found monoterpenes (*e.g.,* a-terpinene, limonene, myrcene, Linalool, citronellyl acetate) and a phenylpropanoid (eugenol) [26]. The aqueous methanolic extract of the fresh flower of B. purpurea gives flavonoid quercetin and flavonoid glycosides isoquercitrin, astragalin **Fig. 7** [27] butein 4' O-β-L-arabinopyranose-O-β-D-galactoside (mp 265º) isolated from the seed of *B. purpura*.

This gave the characteristic color reactions of a chalcone and ion hydrolysis with 8% ethanolic H_2SO_4 for 12 hr gave butein and a disaccharide, the component sugars which were found as galactose and arabinose [28]. A new glycoside 3,4-dihydroxychalcone 4-O-β-L-arabinopyranose-O-β-D-galactopyranoside 9mp 365º) isolated from seed which gave the characteristic color reactions of a chalcone and gave 3,4-dihydroxychalcone, galactose and arabinose on acid hydrolysis (8% ethanolic H_2SO_4 for 12 h).

The identity of sugars was confirmed by co-chromatography with authentic samples and by the preparation of their osazones [29]. After chalcone glycoside a novel flavones glycoside were isolated, Glycoside-6-4'-Dihydroxy-3'-prenyl- 3, 7, 5, 7'-Tetramethoxy Flavone-6-O-α-L-rhamnopyranoside **Fig. 8** from acetone soluble of ethanolic extract from the seed of B, purpurea which gives a positive test for Molisch and structure are confirmed by spectral data analysys [30]. The CH_2Cl_2 extract of root of B. purpurea on purification yield 11 new compounds bauhinoxepin C-J, bauhinobenzofurin A, bauhispirorin A, bauhinol E, two flavanones (-)-strobopinin and demethoxymatteucinol and five known bibenzyls **Fig. 9** which posses various pharmacological activities [31]. All the compound were characterized by spectral analysis. Kachnar (*B. purpurea*) seeds were found to contain about 17.5% crude seed oil. The amount of neutral lipids in the crude seed oil was the highest (99% of total lipids), followed by glycolipids and phospholipids, respectively. Linoleic, followed by palmitic, oleic and stearic were the major fatty acids in the crude seed oil and its lipid classes. The ratio of unsaturated fatty acids to saturated fatty acid, was higher in neutral lipid classes than in the polar lipid fractions.

The oil was characterized by a relatively high amount of phytosterols, wherein the sterol markers were β-sitosterol and stigmasterol. B-Tocopherol was the major tocopherol isomer with the rest being d-tocopherol [32]. *Bauhinia purpurea* seed is a source of galactose and lactose-binding lectin, a peptide which interacts with carbohydrate. The amino acid sequence of the peptide that binds with lactose is Asp-Thr-Trp-Pro-Asp-Thr-Glu-Trp-Ser and is obtained of *Bauhinia purpurea* lectin by affinity chromatography of peptide with Asp-N endoproteinase or trysin on the column of lactose-Sepharose 4B or lactose-, maltose-, fucose- and di-N-ucetylchitobiose-Sepharose and by solid phase synthesis. This peptide exhibits lactose binding activity in the presence of calcium [33].

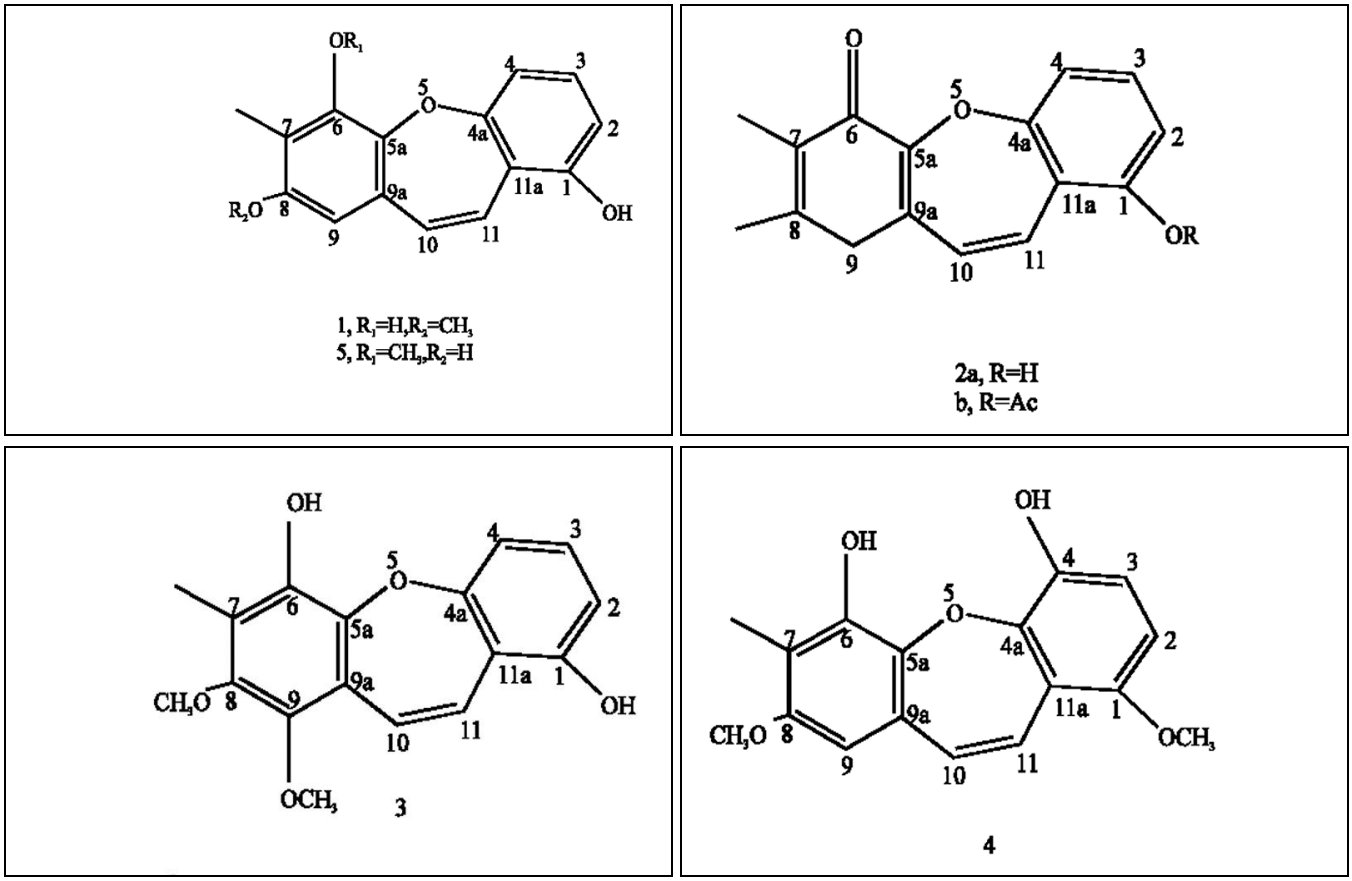


FIG. 2: STRUCTURE OF OXEPINS

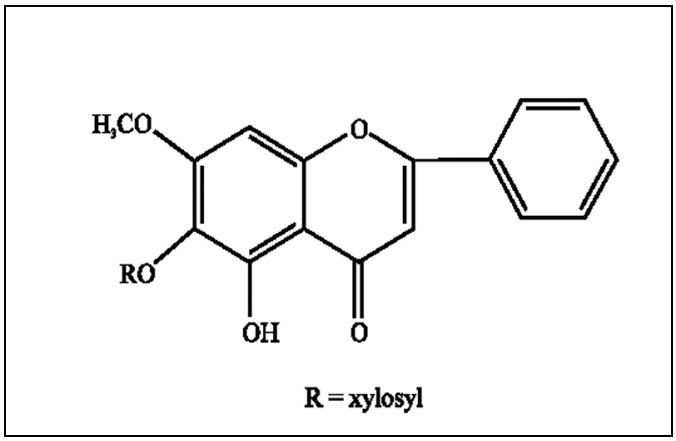


FIG. 3: STRUCTURE OF FLAVONE GLYCOSIDE

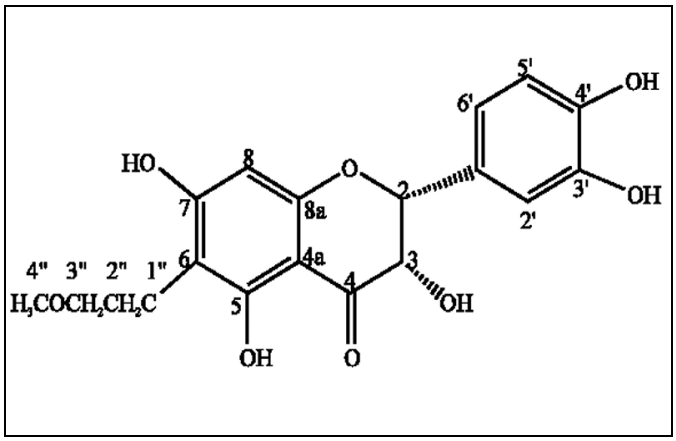


FIG. 4: STRUCTURE OF 6-(3"-OXOBUTYL)- TAXIFOLIN

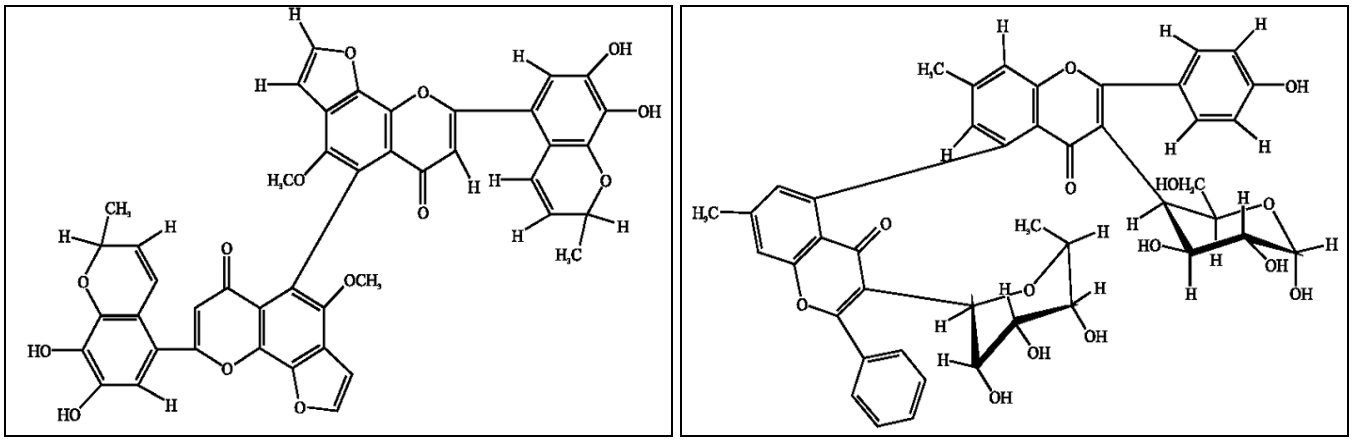


FIG. 5: STRUCTURE OF DIMERIC FLAVONOIDS

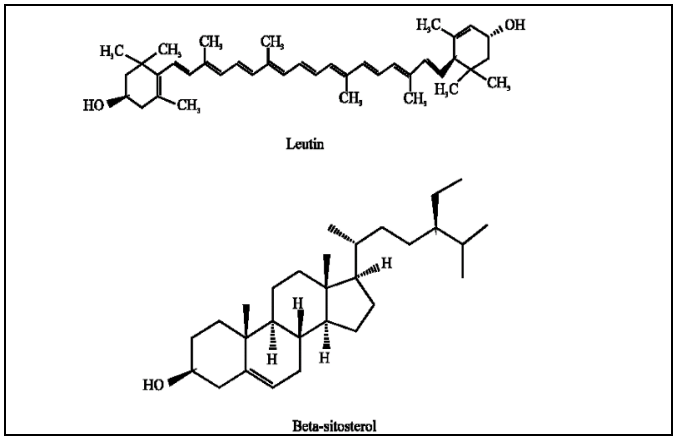
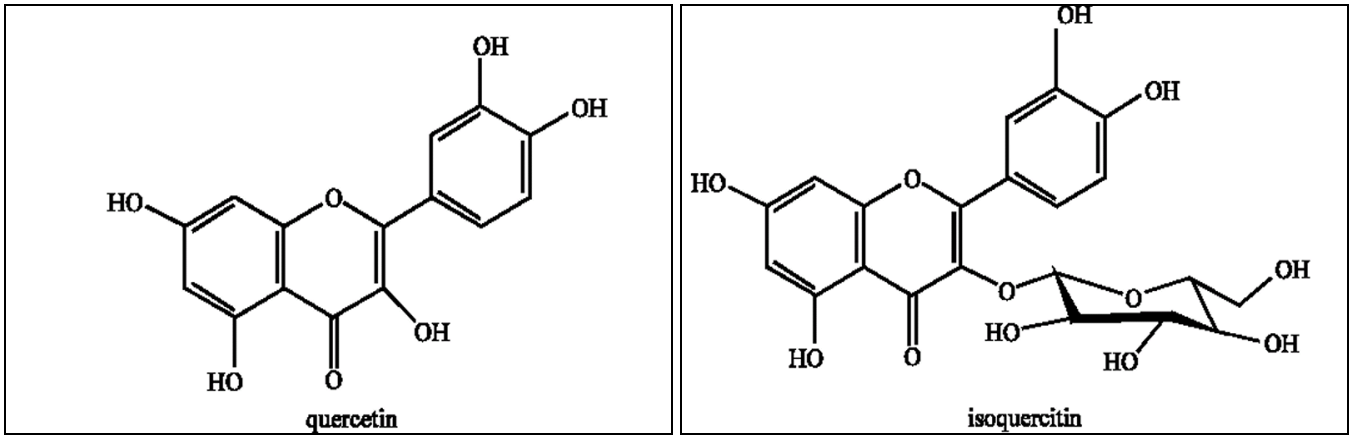


FIG. 6: STRUCTURE OF LEUTIN AND BETA-SITOSTEROL



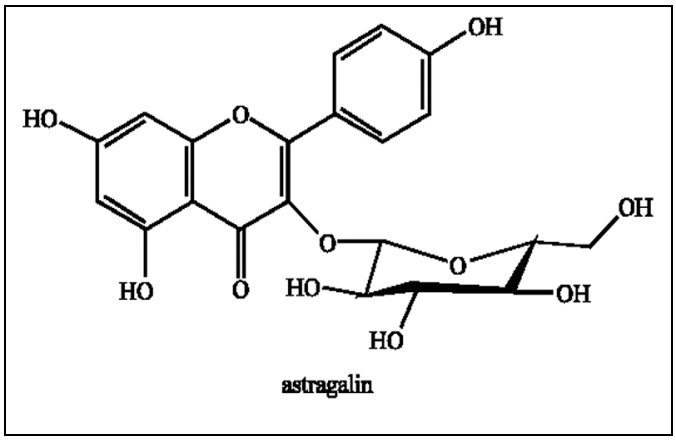


FIG. 7: STRUCTURE OF FLAVONOIDS AND FLAVONOID GLYCOSIDES

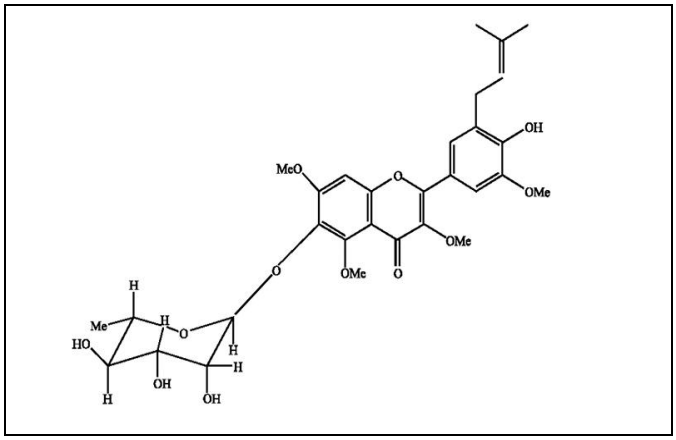


FIG. 8: STRUCTURE OF NOVEL FLAVONE GLYCOSIDE

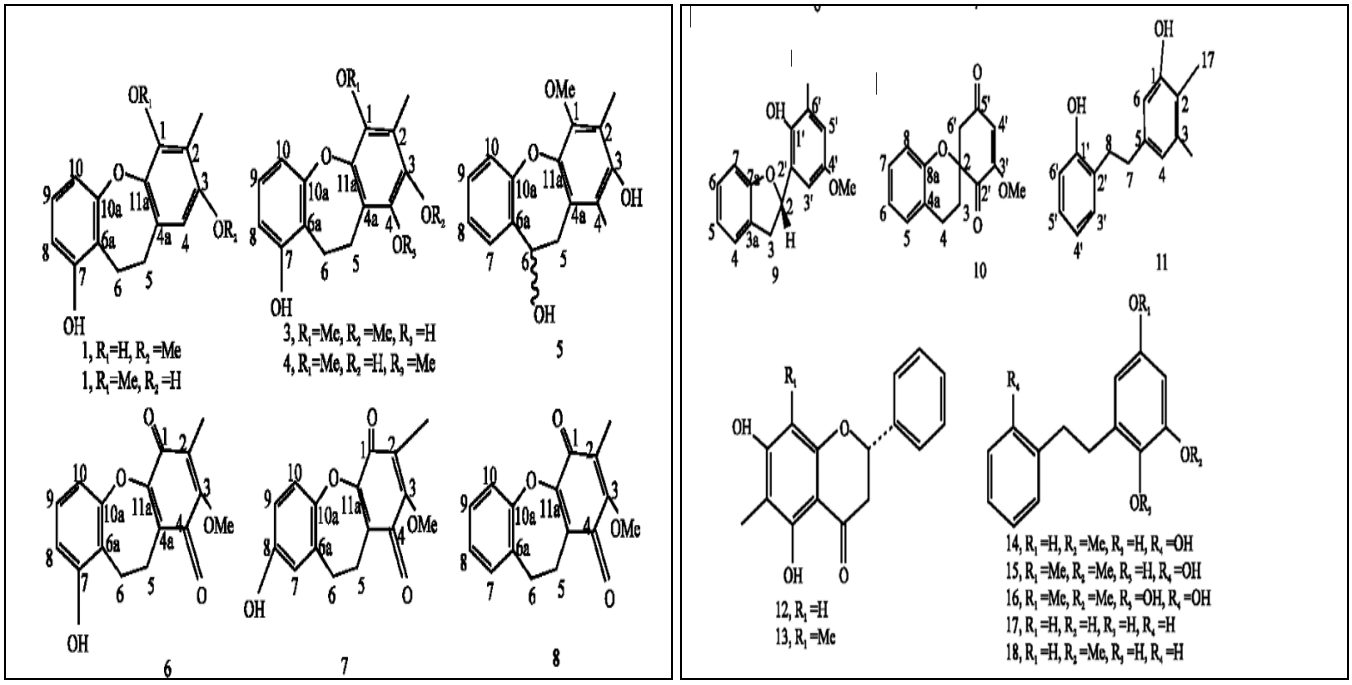


FIG. 9: STRUCTURE OF OXEPINS, FLAVONES AND BIBENZYLS

Pharmacological Properties of *Bauhinia Purpurea:*

Antinociceptive, Analgesic and Antipyretic Activity: The aqueous extract of leaf of *B. purpurea* possesses good antinociceptive, analgesic and antipyretic. The crude dried extract was prepared in doses of 6.0, 30.0 and 60.0 mg/kg and subjected to the respective. They have used antinociceptive (abdominal constriction, hot plate, and formalin tests), and antipyretic (brewer's yeast-induced pyrexia test) assays. The 6.0 mg/kg AEBP exhibited the highest antinociceptive activity. The dose-independent antipyretic activity was observed only at the concentration 6.0 and 30.0 with the former showing remarkable activity even when compared with 100 mg/kg ASA[34].

Zakaria *et al.* (2009) established the antinociceptive activity of chloroform extract of *B. purpurea* leaves using animals models. Analgesic activity of ethanolic extract of stem of *B. purpurea* was subjected. Different CNS depressant paradigms like analgesic activity (Eddy's hot plate method and acetic acid writhing method) were carried out following the intraperitoneal administration of extract at dose level 50 and 100 mg/kg. The dose of 100 mg/kg was comparable with standard drugs [35]. The ethyl acetate extract of stem bark of *Bauhinia purpurea* was found good analgesic activity tested at dose level 400 mg/kg by acetic acid induced writhing model and hot plate method [36].

Cardiac Activity: The cardiotonic activity of purified fraction-1 of ethanolic extract of stem of *B. purpurea* was studied and found that the fraction-1 has exhibited a positive inotropic and chronotropic effect on isolated frog's heart. Its action is blocked by β_2-adrenergic blocker propranolol. The characterization of the isolated compound based on structural studies is under progress [37].

Hormone Regulation: The aqueous alcoholic bark extract of *B. purpura* (2.5 mg/kg body weight) and aqueous root extract *Withania somnifera* (1.4 g/kg body weight) on daily administration for 20 days, stimulating thyroid function in female mice. Both the plant extracts showed an increase in hepatic glucose-6-phosphatase (G-6-Pase) activity and antiperoxidative effects as indicated either by a decrease in hepatic lipid peroxidation (LPO) and by an increase in the activity of the antioxidant enzyme(s). Serum triiodothyronine (T_3) and thyroxine (T_4) concentrations were increased significantly by *Bauhinia Withania* could enhance only serum T_4 concentration [38].

Panda *et al.* (2003) studied the role of *Emblica Officinalis* L. and *Bauhinia purpurea* L. extracts in regulating thyroid functions were studied in male mice. Oral administration of *Emblica Officinalis* L. fruit extract at 30 mg/kg body weight each day for 20 days decreased serum T_3 and T_4 concentrations and hepatic O_2 consumption. In contrast, daily

administration of *B. purpurea* at 2.5 mg/kg body weight each day for 20 days increased serum T_4 concentration and O_2 consumption. Both the plant extracts exhibited hepatoprotective effects as evidenced by decreased lipid per oxidation [39].

Nephroprotective: The ethanolic extract of leaves and unripe pods of *B. purpurea* shows protective action on kidney induced by gentamycin induced nephrotoxicity. Extracts were administered intraperitoneal at dose level 300 mg/kg/day for 8 days reduced blood vessel congestion, epithelial desquamation, accumulation of anti-inflammatory cells and necrosis of kidney cells. This normalizes the increased level of serum creatinine, uric acid, urea, and blood urea nitrogen[40].

Wound Healing Activity: Four different models excision, incision, burn and space wound were used to determine wound healing properties of chloroform and methanol extracts of leaves of *B. purpurae*. Low dose 2.5% (w/w) of chloroform and methanol extracts were prepared in hydrophilic and hydrophobic bases of excision, incision, burn wound models applied topically. *Aloe vera* 5% (w/w) was used as a standard. For dead space wound model 100 and 500 mg/kg and as a standard Aloe vera 300 mg/kg were given orally. *B. purpurea* has almost equal activity with *Aloe vera* in all four wound healing models[41].

Anti-Diarrheal Activity: The ethanolic extract of leaves shows an inhibitory effect at different dose level on animal models castor oil induced diarrhea in rats and gastrointestinal motility test by using the charcoal meal. These inhibitory effects support the use of the leaves of *B. purpurea* in folklore medicine [42].

Antibacterial and Anti-Fungal Activity: The antimicrobial activity of leaf extract was determined in aqueous and organic extracts and the minimum inhibitory concentration (MIC) against six species of pathogenic and non-pathogenic microorganism - *Bacillus subtilis, Staphylococcus aureus, salmonella typhi, Escherichia coli, Pseudomonas aeruginosa* and *candida albicans* using the disk diffusion method. The chemical constituent organic plant extract were separated by Thin layer chromatography and purified by column chromatography and further identified by gas chromatography-mass spectrometry (GC-MS) analysis. Significant inhibitory activity was observed with methanol extracts of the plant against the test microorganisms while less antibacterial activity was observed in hexane, acetone and aqueous extracts [43].

Antioxidant Activity: It explored as well as compared the antioxidant activity of the different plant parts of *B. purpurea* Linn, 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical scavenging and nitric oxide (NO) scavenging capacity were a measure to determine the antioxidant activity of both leaves and bark of the plant. Solvent-solvent partitioning was accomplished to obtain extracts of different polarities as n-hexane, ethyl acetate, and methanol extract. All the extracts exhibited potent antioxidant activity in terms of DPPH and NO scavenging capacity [44].

Antidiabetic Activity: (A) It revealed that the bark of *Bauhinia purpurea* linn. was traditionally used as an astringent in diarrhea, the flower is laxative. The study was undertaken to evaluate antidiabetic activity of *B. purpurea* stem extract of chloroform, methanol, petroleum ether, ethyl acetate and was evaluated on mice, *i.e.* alloxan-induced diabetes in mice by glucometer method and higher values showed the significant values [45].

(B) It evaluated antidiabetic activity of ethanol extract of *Bauhinia Purpurea* linn plant parts, viz stem, root, leaf, and flowers in wistar rats. Diabetes Mellitus was induced in the rat by single intraperitoneal injection of streptozotocin (STZ, 50 mg/kg body weight). After STZ induction, the hyperglycemic rats were treated with all three extracts orally at the dose of 200 mg/kg body weight daily for 15 days. Given clamide (0.5 mg/kg body weight p.o.) was used as reference drug. The fasting blood glucose levels were measured on every 5th day during the 15-day treatment. All the extract at 100, 200, 400 mg/kg orally significantly ($p<0.001$) exhibited antidiabetic activity in STZ-induced diabetic rats by reducing and normalizing the elevated fasting blood glucose level as compared to those of STZ control group. The methanol extract was most active [46].

(C) The rat is showing blood glucose level 250-350 mg/dl were considered as a diabetic rat, induced by

alloxan. The hypoglycemic activity of ethanolic extract and purified fraction-1 of the stem of *B. purpurea* were studied and found that the dose of 100 mg/dl (i.p.) reduces serum glucose level of Wistar rats due to inhibition of cyclooxygenase and promote β-cell regeneration [47].

Anti-inflammatory Activity: It reviewed a large group of medicinal plants including B. purpurea which were used as traditional medicine and had the potential to cure various ailments and reported that medicinal plants have potent anti-inflammatory activity. Various models tested for anti-inflammatory activity. Carrageenan, Histamine, Dextran, Serotonin, induced hind paw edema, cotton pellet induced granuloma Freund's Adjuvant were the standard experimental models of acute and sub-acute and chronic inflammation respectively. The test phytodrugs were effective in all the models of inflammation[48].

Antiulcer Activity: This reviewed the plants which have efficacy to protect or treat gastric ulcer induced by various factors. *B. purpurea* and other plants had been screened by in vivo and in vitro, possessing anti-ulcer activity and can be used as an alternate source to treat ulcer [49].

Antimalarial, Antimycobacterial, Antifungal and Cytotoxicity Activities: The isolated compounds from roots exhibited antimycobacterial activity with MIC valve ranging from 24.4 to 740.7 µM. Among the compounds bauhinoxepins J is a potent antimycobacterial agent activity having MIC 24.4 µM. Among the isolated metabolites, compounds 6,7, 8 and 13 exhibited antimalarial activity (IC_{50} 5.8-11.2 µM), while compounds 1,4,9,15 and 18 exhibited antifungal activity (IC_{50} 49.6-130.1 µM) Compound 1, 2, 4, 6, 7, 8, and 18 exhibited cytotoxicity towards KB and BC cell line with IC_{50} values ranging from 10.5 to 72.3 µM. Compounds 4 and 7 posses potent anti-inflammatory activity inhibiting the COX-2 enzyme with an IC_{50} value of 6.9 and 10.1 µM respectively [50].

CONCLUSION: The scientific research on *B. purpurea* is suggested a huge biological potential of this plant. It is strongly believed that detailed information as presented in this review on the phytochemical and various biological properties of the extracts might provide detailed evidence for the use of this plant in different medicines. The phytochemical variation and efficacy of the medicinal values of *B. purpurea* are dependent on geographical locations.

Even today, plant is the almost exclusive source of drugs for a majority of the world population. Therefore, it remains a challenge for the scientist to provide efficient, safe and cheap medication, especially for the rural area. These *Bauhinia* species and their quantification of individual phytoconstituents as well as a pharmacological profile based on in vitro, in vivo studies and on clinical trial should be further investigated.

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CONFLICT OF INTEREST: Nil

REFERENCES:

1. WHO. Research Guideline for Evaluating the safety and efficacy of herbal Medicines. WHO, Manila. Philippines, 1993:2.
2. Kirtikar KR and Basu BD: Indian Medicinal plant, 2nd edition International book distributors; Dehradun 1991; 2: 856-860.
3. Kietikar KR and Basu BA: Indian Medicinal plants 2nd edition, periodical experts book agency, New Delhi, India. 1991; 856-860.
4. The Ayurvedic Pharmacopoeia, Vol-1st, part-1: 73.
5. Khare CP: Encyclopaedia of Indian Medicinal Plant, Springer-Verlag, New York 2004: 95-96.
6. Jha LK: Advances in Agroforestry. APH Publishing Corporations, New Delhi, India 1995: 669.
7. Chopra RN, Nayar SL and Chopra IC: Glossary of Indian Medicinal Plants. CSIR, New Delhi, ISBN: 8172361262; 1996
8. 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.
9. Patil VK: Prospect and potential of medicinal and aromatic plant in Chattisgarh. IG Agriculture University, Raipur, India 2003: 17.
10. Kurjan JC: Plant that Heal. 7th edition, Oriental Watchman Publishing House, Pune 2004: 31.
11. Wassel M, abdel-Wahab SM and Ammar NM: Constituents of the essential oils from *Bauhinia variegata* L. and *Bauhinia purpurea* L. flowers. Sci Pharm 1996; 54: 357-361.
12. Jones DT and German P: Flora of Malaysia. Oxford University Press, Oxford 1993: 154.
13. Asolkar LV, Kakkar KK and Chakre OJ: Second Supplement to Glossary of Indian Medicinal Plants with

active principles. National Institute of Science Communication, New Delhi 2000.
14. Kalakoti BS and Pangtey YPS: Ethno-medicine of Bhotia tribes of Kumaon Himalaya, UP. Bull Med Ethno Bot Res 1998; 9: 11-20.
15. Pawar S and Patil DA: Ethnomedicinal uses of barks in Jalgaon district. Nat. Prod. Radiance. 2007; 6: 341-346.
16. Patil GG, Mali PY and Bhadane VV: Folk remedies used against respiratory disorders in Jalgaon district, Maharashtra. Nat Prod Radiance 2008; 7: 354-358.
17. Das AK, Datta BK and Sharma GD: Medicinal plants used by different tribes of Cachar districts, Assam. Ind J Trad Knowledge 2008 7: 446-454.
18. Chatterjee A and Pakrashi SC: The Treatise of Indian Medicinal Plants. Vol. 2, Council of Scientific and Industrial Research, New Delhi 1992.
19. Kamble SY, Patil SR, Sawant PS, Sawant S, Pawar SG and Singh E.A: Studied on plant used in traditional medicine by Bhilla tribe of Maharashtra. Indian J. Trad. Knowledge 2010; 9: 591-598.
20. Pettit GR, Numata A, Iwamoto C, Usami Y, Yamada T, Ohishi H and Cragg GM: Antineoplastic agent 551 isolation and structure of Bauhiniastatins-1-4 from Bauhinia purpurea. J Nat Prod 2006; 69: 323-327.
21. Yadav RN and Tripathi P: A novel flavones glycoside from the stem of *B. purpurea*. Fitoterapia 2000; 71: 88-90.
22. Kuo YH, Yeh MH and Huan SL: A novel 6-butyl-3-hydroxyflavanone from heartwood of *Bauhinia purpurea*. Phytochemistry 1998; 49: 2529-2530.
23. Yadav S and Bhadoria BK: Two dimeric flavonoids from Bauhinia purpurea. Ind J Chem 2005; 44: 2604-2607.
24. Ragasa CY, Hofilena JG and Rideout J: Secondary metabolite from *Bauhinia purpurea*. J Sci Food Agric 2004; 55: 423-431.
25. Verma T and Chandrashekar KS: A-amyrin caprilate - A new triterpene isolated from the leaf of *Bauhinia purpurea* linn. Asian J Res Chem 2009; 2: 569-570.
26. Wassel M, Abdel-Wahab SM and Ammar NM: Constituents of the essential oils from *Bauhinia variegata* L. and *Bauhinia purpurea* L. flowers. Sci Pharm 1986; 54: 357-361.
27. Ramchandra R and Joshi BC: Chemical examination of *Bauhinia purpurea* flower. Curr Sci 1967; 36: 574-575.
28. Bhartiya HP, Dubey P, Katiyar SB and Gupta PC: A new chalcone glycoside from *Bauhinia purpurea*. Phytochemistry 1979; 18: 689-689.
29. Bhartiya HP and Gupta PC: Chalcone glycoside from the seeds of Bauhinia purpurea. Phytochemistry 1981; 20: 2051-2051.
30. Yadav RN and Sodhi S: A novel flavones glycoside-6-4-diahydroxy-3-prenyl-3,7,5,7-tetramethoxy flavones-6-O-a-L-rhamnopyranoside was isolated from seed of Bauhinia purpurea. Asian J Chem 2000; 13: 529-533.
31. Boophong S, Puangsombat P, Barmee A, Mahidol C, Ruchirawat S and Kittakoop P: Bioactive compounds from Bauhinia purpurea possessing Antimalarial, antimycobacterial, antifungal, anti-inflammatory and cytotoxic activities. J Nat Prod 2000; 70: 795-801.
32. Ramadana MF, Sharanabasappab G, Seetharamb YN, Seshagiric M and Moerseld JT: Characterization of fatty acids and bioactive compounds of kachnar (Bauhinia purpurea L.) seed oil. Food Chem 2006; 98: 359-365.
33. Yamamoto K, Konami Y, Kusui K and Osawa T: Purification and characterization of a carbohydrate-binding peptide from *Bauhinia purpurea* lectin. FEBS Lett 1981; 281: 258-262.
34. Zakaria ZA, Loo YW, Abdul-Rehman NI, Abdul-Ayub AH, sulaiman MR and Kumar GH: Antinociceptive, anti-inflammatory and antipyretic properties of Bauhinia purpurea leaves aqueous extract in experimental animals. Med Prin Prac 2007; 16: 443-449.
35. Shreedhara CS, Vaidya VP, Vagdevi HM, Latha KP, Muralikrishna KS and Krupanidhi AM: Screening of Bauhinia purpurea linn. for analgesic and anti-inflammatory activities. Indian J Pharmacol 2009; 41: 75-79.
36. Chandrashekar KS, Kumar T, Joshi AB, Santanu S and Hitesh: Anti-inflammatory activity of *Bauhinia purpurea* stem barks extract against carrageenan induced rat paw edema. Herbal Heritage 2009a 1: 42-45.
37. Muralikrishna KS, Latha KP, Shreedhara CS, Vaidya VP and Krupanidhi AM: Effect of *Bauhinia purpurea* Linn. on alloxan-induced diabetic rats and isolated frogs heart. Int J Green Pharm 2008; 2: 83-86.
38. Panda S and Kar A: *Withania somnifera* and *Bauhinia purpurea* in the regulation of circulating thyroid hormone concentration in female mice. J Ethnopharmacol 1999; 67: 233-239.
39. Panda S, Karr A and Bharti S: Regulation of thyroid function in mice with extract of *Emblica officinalis* L. and *B. purpurea* Linn. J Herb Spices Med Plants 2003; 10: 1-9.
40. Lakshmi BVS, Neelima N, Kashturi N, Umarani V and Sudhakar M: Protective effect of *Bauhinia purpurea* on gentamycin induced nephrotoxicity in rat. Indian J Pharm Sci 2009; 71: 551-554.
41. Ananth KV, Asad M, Kumar NP, Asdaq SMB and Rao GS: Evaluation of wound healing potential of *Bauhinia purpurea* leaf extracts in Rats. Indian J Pharm Sci 2010; 72: 122-127.
42. Mukherjee PK, Gopal TK and Subburaju T: Studies on the anti-diarrheal profiles on *Bauhinia purpurea* Linn. leaves extract. Nat Prod Sci 1998; 4: 234-237.
43. Negi BS, Dave BP and Agarwal YK: Evaluation of antimicrobial activity of *Bauhinia purpurea* leave under in vitro condition; Indian J Microbial 2012; 52(3): 360-365.
44. Urmi KF, Begum SMG, Ifa T and Hamid K: Comparative antioxidant activity of different parts of *Bauhinia purpurea* linn. Biology and Medicine 2013. 5: 78-82.
45. Meshram SS, Itankal PR and Patil AT: To study antidiabetic activity of stem bark of *Bauhinia purpurea* Linn. Journal of Pharmacognosy and Phytochemistry 2013; 2(1): 171-175.
46. Sharma PK and Shastry CS: Evaluation of antidiabetic activity of *Bauhinia purpurea* Linn in streptozotocin induced diabetic rats. International Journal of Advances in pharmacy, Biology and Chemistry 2012; 1(4): 536-539.
47. Muralikrishna KS, Latha KP, Shreedhara CS, Vaidya VP and Krupanidhi AM: Effect of *Bauhinia purpurea* Linn. on alloxan-induced diabetic rats and isolated frogs heart. Int J Green Pharm 2008; 2: 83-86.
48. Murugesan D and Deviponnuswamy R: Potential anti-inflammatory medicinal plants- a review. International Journal of Pharmacy and Pharmaceutical Science 2014; 6(4): 43-49.
49. Sultana S, Akram M, Asif HM and Akhtar N: Complementary and alternative approaches to treat peptic ulcer. International Research Journal of Pharmacy 2014 5(5): 353-359.
50. Boophong S, Puangsombat P, Barmee A, Mahidol C, Ruchirawat S and Kittakoop P: Bioactive compounds from *B. purpurea* possessing antimalarial, antimycobacterial, antifungal, anti-inflammatory and cytotoxic activities. J Nat Prod 2007; 70: 795-801.

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