

## PHARMACOLOGY AND PHYTOCHEMISTRY OF *BAUHINIA VARIEGATA* L.

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### ABSTRACT

*Bauhinia variegata* L. is medium sized plant and belongs to family *Leguminosae*, includes more than 200 species. These all are found in different parts of India and is known by various names. Kachnar tree possess various biological and therapeutic properties (anti-inflammatory, antidiabetic, haematinic, immunomodulatory, haemagglutinating, antitumour, antimicrobial, hepatoprotective, antibacterial and antiulcer activity). It contains numerous phytochemicals like flavonoids, tannins, kaempferol, terpenoids, saponins, cardiac glycosides and quercetin which plays a vital role in promoting human health. Despite of its composition and various health benefits, its commercial utilization is still limited because of its availability at limited places for limited time; therefore the demand of the present era is to explore this plant for its utilization in food and pharmacy industry with scientific intervention.

### INTRODUCTION

*B. variegata* (Kachnar) is deciduous, fast growing flowering tree, mainly distributed in the tropical countries as well as carnatic and deccan regions of southern India and stony hills of Circars (Sahu and Gupta 2012). The word Kachnar means "A beautiful glowing lady" in Sanskrit (Irchhaiya *et al.* 2014). It has been used in the folk medicine for variety of purposes. For instance, it is used for the treatment of different kinds of infections, pathologies, mainly diabetes, in addition to inflammation and pain owing to the existence of various phytochemicals residing in the plant. The buds of the flowers of *Bauhinia variegata* are used for making pickles traditionally because of its unique property that it is rich in antioxidants, crude proteins, fats, crude fibers, total carbohydrates and contains significant amount of moisture and ash content (Verma *et al.* 2012) where it is native. Buds of Kachnars are used on commercial scale in local markets later on

which can be used for curry preparation or various dish preparation such as pakoras. The flowers of *Bauhinia variegata* contains digestible carbohydrates, significant amount of protein content, fat content, etc. and also has high energy value. Besides its traditional uses and known health benefits, the crop is still underutilized. The demand of the current era is to explore such plants for their value addition. Therefore, the present review is aimed to explore the plant in terms of its availability, composition, health benefits, utilization (traditional and modern) and future prospective.

### Origin and distribution

The origin of *Bauhinia variegata* has been reported in East Indies and was first naturalized in Jamaica and then spread to many other countries like Texas and Louisiana. Generally, *Bauhinia variegata* grows at 1300 m altitude but also found in deciduous forests and occurs up to 900 m altitude in dry mixed forests (Sahu and Gupta 2012).

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**Table 1:** Vernacular names of *Bauhinia variegata*. (Orwa *et al.*, 2009; Sudheer kumar *et al.*, 2015)

Language	Name
Sanskrit	Raktakanchan, Phalgu
Kannada	Bilimandar, Kanchavala
Telugu	Adavimandaramu, Devakanchanamu
Malyalam	Mandaramu, Chuvannamandaram
Hindi	Kachnar, Bogakatra, Koliar, Mandari, Kural, Gurial,
Tamil	Kattaki, Kanjani, Chemmonadarei
English	Mountain Ebony, Orchid tree, Camel's foot, Napoleon's hat, Paper mulbertr, Poor man's orchid
Spanish	Flamboyanorquidea, Palo de orquideas
Punjabi	Kanchanal, Kovidara, Kolar
Urdu	Kachnal
Odia	Kosonara, Kachan, Borada
Bengali	Swet-Kanchan, Rakta-Kanchan, Rakta-Kamhar
Malay	Akbar tapakkerbau, Kupu-kupu, Kotidaram
Nepali	Kachnar, Koiralo

**Traditional utilization as medicine:**

Parts	Traditional uses	References
Flower	galactagogue	Shirkande and Shirkande (2016)
	laxative	Sharma <i>et al.</i> (2011)
	leucorrhoea and Mumps	Bhattarai <i>et al.</i> (2013) and Shirkande and Shirkande (2016)
	treatment of various women's diseases by <i>Chakma</i>	Sahu and Gupta (2012)
	dysentery and diarrhoea	Sahu and Gupta (2012)
	Gastro-intestinal problems	Burlakoti and Kunwar (2008)
	Genito-urinary problems	Burlakoti and Kunwar (2008)
	used in Ayurvedic and Yunani medical system	Sharma <i>et al.</i> (2011)
	Paste of fresh flowers along with sugar in 2:1 is used as laxative	Sahu and Gupta (2012) and Shirkande and Shirkande (2016)
	galactagogue	
Leaves	ulcers	
	bleeding piles and malaria	
	In Bihar, the flowers are used as an antifertilizing agent	
	Headache during malarial fever, jaundice, stomach tumours and wounds	Sahu and Gupta (2012)
Bud	urinary infection	Sharma <i>et al.</i> (2011)
	laxative, headache in malarial fever, boils, piles	Sahu and Gupta (2012)
	vaginal discharge	Sharma and Kumar. (2012)
Bud	Menorrhagia	Pahwa <i>et al.</i> (2011)
	vermifuge	Sahu and Gupta (2012) and Shirkande and Shirkande (2016)
	Black pepper and flower bud powder in ratio 3:5(w/w) is used for the regulation of vaginal discharge	
	dysentery, diarrhoea, infestation, worms, tumours and piles	Sahu and Gupta (2012)

Bark	Piles, dysentery, leprosy, Flatulence, piles, malaria, tumours	Sahu and Gupta (2012) and Shirkande and Shirkande (2016)
	diarrhoea, amoebic dysentery and various stomach disorders	Bhattarai <i>et al.</i> (2013) and udheerkumar <i>et al.</i> (2015)
	blood pressure	Pokhrel <i>et al.</i> (2002)
	astringent, skin disease, alliterative, crofula, ulcers and as tonic	Pokhrel <i>et al.</i> (2002)
	goitre	Sahu and Gupta (2012)
	as remedy for scrofula	Sahu and Gupta (2012)
	cuts, wounds and in treatment of ulcers, scrofula and other skin diseases, healing of bone fracture	Sahu and Gupta (2012) and Sudheerkumar <i>et al.</i> (2015)
	snakebite, obesity, indigestion, pox	Sahu and Gupta (2012)
	t scrofula and leprosy, asthma, cough, etc.	Sahu and Gupta (2012) and Sudheerkumar <i>et al.</i> (2015)
Root	rheumatism	Sahu and Gupta (2012)
	wounds and cuts on body	Sahu and Gupta (2012)
Stem bark	dysentery and leprosy, syphilis, worm infection (krinroga), scrofula (gandamala), wounds (vrna), cervical lymphadenitis (apaci) and other skin diseases	Singh <i>et al.</i> (2002) and Sahu and Gupta (2012)
	leucoderma	Sahu and Gupta (2012)
	rheumatism	Sahu and Gupta (2012)
	healing of bone fractures in cattles	Sahu and Gupta (2012)
	Menorrhagia	Yadav <i>et al.</i> (2006)
Root bark	obesity and indigestion	Shirkande and Shirkande (2016)
	boils	Sahu and Gupta (2012)

#### Phytochemical composition of various parts of *Bauhinia variegata*

Parts	Chemical composition	References
Flowers	malvidin-3-diglucoside, cynidin-3-glucoside, peonidin-3-diglucoside, malvidin-3-glucoside, quercitroside, rutoside, isoquercitroside, taxifolinerhamnoside, kaempferol-3-glucoside, Myricetrol, ascorbic acid, aspartic acid, glutamic acid, keto acids, octadecanoic acid, amino acids, apigenin, tannins	Dugasani <i>et al.</i> (2010), Chandra <i>et al.</i> (2015) and Shahana and Nikalje (2017)
Leaves	Crude protein, phosphorus, calcium, lupeol, carbohydrates, vitamin C, reducing sugars, Saponins, fibres, quercetin, quercitrin, $\beta$ -sitosterol, terpenoids, kaempferol-3-glucoside, tannin, rutin, heptatriacontane-12,13-diol 7 dotetracont-15- en-9-ol ellagic acid, catechol, sterols, tannins, oil, alkaloids, fats, lignin, glycoside, phenolics, apigenin-7-o-glycoside amides	Singh and Pandey (2006), Gupta <i>et al.</i> (2009), Dhale (2011) and Singh <i>et al.</i> (2016)
Stem bark	lupeol, kaempferol-3-glucoside, $\beta$ -isosterol, 5,7 dimethoxyflavanone-4-o-L, rhamnopyrosyl- $\beta$ -Dglycopyranoside, hentriacontane, stigmasterol, octacosanol, reducing sugars, nitrogenous substances,	Yadava and Reddy (2003), Zhao <i>et al.</i> (2005), Rajani and Ashok (2009), CechineIFilho2009, Shah <i>et al.</i> (2010), Dhale (2011) and Singh <i>et al.</i> (2016)

Root bark	flavanone (2S)-5, dihydrodibenzoxepin, 7-dimethoxy-3,4methylene dioxyflavonone 5,6b dihydro-1,7-dihydro-1,7 dihydroxy-3,4- dimethoxy-2-methyl dibenz oxepin	Yadava and Reddy (2003)
Stem	$\beta$ -sitosterol, naringenin 5,7 dimethyl ether 4- rhamnoglucoside, lupeol	Zhao <i>et al.</i> (2005)
Roots	flavonol glycosides 5,7,3,4 tetrahydroxy-3- methoxy-7-o- $\alpha$ -L rhamnopyranosyl (1-3)-o- $\beta$ -D- galactopyranoside	Gunalan <i>et al.</i> (2011)
Seeds	Oleic acid, palmitic acid, linoleic acid, stearic acid, proteins	Singh <i>et al.</i> (2016) and Shahana and Nikalje (2017)

### Pharmacological activities of various parts of *Bauhinia variegata*

Parts	Biological activity	References
Flowers	Antidiarrhoeal, Antidiabetic, antioxidant, anti-hyperlepidemic activity	Ahmed <i>et al.</i> (2012), Negi <i>et al.</i> (2012), Sharma <i>et al.</i> (2011), Singh <i>et al.</i> (2019) and Tripathi <i>et al.</i> (2019)
Leaves	Antifungal, Antimicrobial, Antidiabetic, Hypoglycemic, Molluscicidal effect, Anti cancerous activity	Sharma and Saxena (1996), Azevedo <i>et al.</i> (2006), Dhale (2011), Lim (2014), Roqaiya <i>et al.</i> (2015), Singh <i>et al.</i> (2019), Shamran <i>et al.</i> (2020) and Abdel-Halim <i>et al.</i> (2020)
Stem bark	Antitumour, Antiulcer, Immunomodulatory effect, Haematinic, Antimicrobial, Hepatoprotective, Antioxidant, ntbacterial, Anticarci nogenic	Parekh <i>et al.</i> (2006), Bodakhe and Alpana (2007), Rajani and Ashok (2009), Gupta <i>et al.</i> (2009), Ghaisas <i>et al.</i> (2009), Gunalan <i>et al.</i> (2011), Jash <i>et al.</i> (2014), Lim (2014), Singh <i>et al.</i> (2019) and Kumar <i>et al.</i> (2019)
Root bark	Antioxidant, Antiobesity effect	Maldonado <i>et al.</i> (2003)
Stem	Antiulcer	Raj Kapoor <i>et al.</i> (2003) and Pani <i>et al.</i> (2011)
Roots	Anti-inflammatory, Wound healing, nephroprotective effect, Antimutagenic and antioxidant activity	Yadava and Reddy (2003), Sharma <i>et al.</i> (2011) and Golwala <i>et al.</i> (2020)
Seeds	Haemagglutinating	Wassel and Ammar (1989)

The trees are mostly found in tropical and subtropical countries (Samant *et al.* 2014) and is native to many countries like India, China, Pakistan, Burma, North Thailand, North Vietnam, Peoples Democratic republic of Lao, Cambodia and Laos (Cechinel Filho 2009). It is known by different names depending upon the location where it is distributed (table 1) Beside its wild habitat, *Bauhinia variegata* is also cultivated along the road sides as an avenue plants in natural thickets, streets, yards and park sides for its beauty and fragrance of the flowers (Connor 2002; PIER 2014; Sudheer kumar *et al.* 2015). *Bauhinia*

*variegata* can grow even in well drained soils, but prefers slightly acidic or acidic soil. Basically, the plants grow best on hilly or slopy areas that possess rocky soil, loamy soil or sandy loam soil. The suited temperature for its growth is 32-42°C (mean maximum range) and 7-14°C (mean minimum range) along with rainfall in range 760-1900 mm. The flowering of the tree starts when it attains the age of 2 or 3 and blooms when the dry summer approaches usually in the month of January-April and fruiting occurs in the period of March-July (Singh *et al.* 2016).

## CONCLUSION

*B. variegata* (Kachnar) is the medicinal plant which is used for the cure of various diseases and exhibits antiinflammatory, antibacterial, antioxidant, hepatoprotective, hypolipidemic, nephroprotective, wound, antiulcer, antidiabetic and astringent effects. The various aspects were discussed about the history, botanical description, medicinal uses, health uses, cultivation and chemical constituents of *B. variegata*. A variety of chemical constituents are present in *B. variegata* which are responsible for various pharmacological properties, that is, tannins, glycosides, flavonoids, alkaloids and terpenoids. To combat the emerging health issues, *B. variegata* has the potential to be evaluated further for its medicinal and health properties.

## REFERENCES

- Abdel-Halim AH, Fyiad AAA, Aboulthana WM, El-SammadNM, Youssef AM and Ali MM (2020). Assessment of the anti-diabetic effect of *Bauhinia variegata* gold nano-extract against streptozotocin induced diabetes mellitus in rats. *J Allied Pharm Sci.*, **10**(05): 077-091.
- Ahmed AS, Elgorashi EE, Moodley N, McGaw LJ, Naidoo V and Eloff JN (2012). The antimicrobial, antioxidative, anti-inflammatory activity and cytotoxicity of different fractions of four South African *Bauhinia* species used traditionally to treat diarrhoea. *J Ethnopharmacol.*, **143**(3): 826-839.
- Azevedo CR, Maciel FM, Silva LB, Ferreira ATS, Da Cunha M, Machado OLT, Fernandes KVS, Oliveira AEA and Xavier-Filho J (2006). Isolation and intracellular localization of insulin-like proteins from leaves of *Bauhinia variegata*. *Braz J Med Biol Res.*, **39**(11): 1435-1444.
- Bhattarai KR, Måren IE and Chaudhary RP (2013). Medicinal plant knowledge of the Panchase region in the middle hills of the Nepalese Himalayas. *BankoJanakari* **21**(2): 31-39.
- Bodakhe SH and Alpana RAM (2007). Hepatoprotective properties of *Bauhinia variegata* bark extract. *Yakugakuzasshi* **127**(9): 1503-1507.
- Burlakoti C and Kunwar RM (2008). Folk herbal medicines of Mahakali watershed Area, Nepal. In: Jha PK, Karmacharya SB, Chettri MK, Thapa CB, Shrestha BB (eds) Medicinal plants in Nepal: an anthology of contemporary research. *Ecological Society, Nepal*, pp. 187-193.
- CechinelFilho V (2009). Chemical composition and biological potential of plants from the genus *Bauhinia*. *Phytother Res.*, **23**(10): 1347-1354.
- Chandra TR, Suresh C, Sanghamitra D and Kumar GR (2015). Kanchnara (*Bauhinia variegata* Linn): a critical review. *Int J Ayurveda Pharm Res.*, **3**(7): 39-46.
- Connor KF (2002). *Bauhinia variegata* L. In: Vozzo JA (ed) Tropical tree seed manual agric handbook, vol 721, Washington, DC: US Department of Agriculture, Forest Service, pp. 332-334.
- Dhale DA (2011). Phytochemical screening and antimicrobial activity of *Bauhinia variegata* Linn. *J Ecobiotechnol.*, **3**(9): 4-7.
- Dhyani N and Gupta A (2016). Nutritional composition of dehydrated Kachnar leaves (*Bauhinia purpurea*) powder. *Int J Home Sci.*, **2**(2): 363-364.
- Dugasani S, Balijepalli MK, Tandra S and Pichika MR (2010). Antimicrobial activity of *Bauhinia tomentosa* and *Bauhinia vahlii* roots. *Pharmacogn Mag.*, **6**(23): 204-207.
- Ghaisas MM, Shaikh SA and Deshpande AD (2009). Evaluation of the immunomodulatory activity of ethanolic extract of the stem bark of *Bauhinia variegata* Linn. *Int J Green Pharm.*, **3**(1): 70-74.
- Golwala DK, Vaidya SK, Dholwani KK, Patel DS and Sahoo S (2020). Antioxidant and antimutagenic (anticlastogenic) activity of alcoholic extract of *Bauhinia variegata* (Linn.) root. *Eur J Med Plants*, 2020: 32-39.

- Gunalan G, Saraswathy A and Krishnamurthy V (2011). Antimicrobial activity of medicinal plant *Bauhinia variegata* Linn. *Int J Pharma Biol Sci.*, **1**(4): 400-408.
- Gupta R, Paarakh PM and Gavani U (2009). Pharmacognostical and phytochemical screening of *Bauhinia variegata* Linn leaves. *J Pharm Res.*, **2**(7): 1196-1198.
- Irchhaiya R, Kumar A, Gurjar H, Gupta N, Kumar S and Kumar M (2014). Plant profile, phytochemistry and pharmacology of *Bauhinia variegata* Linn. (Kachnar): an overview. *Int J Pharmacol.*, **1**(5): 279-287.
- Jash SK, Roy R and Gorai D (2014). Bioactive constituents from *Bauhinia variegata* Linn. *Int J Pharm Biomed Res.*, **5**(2): 51-54.
- Kumar A, Anand V, Dubey RC and Goel KK (2019). Evaluation of antioxidant potential of alcoholic stem bark extracts of *Bauhinia variegata* Linn. *J Allied Nat Sci.*, **11**(1): 235-239.
- Lim TK (2014). *Brassica oleracea* (Italica Group). In: Lim TK (ed) Edible medicinal and non-medicinal plants, Springer, Netherlands, pp 594-623.
- Maldonado PD, Barrera D, Rivero I, Mata R, Medina-Campos ON, Hernández-Pando R and Pedraza-Chaverrí J (2003). Antioxidant S-allylcysteine prevents gentamicin-induced oxidative stress and renal damage. *Free Radical Bio Med.*, **35**(3): 317-324.
- Naeem MY and Ugur S (2019). Nutritional and health consequences of *Bauhinia variegata*. *Turk JAFSci Tech.*, **7**(sp3): 27-30.
- Negi A, Sharma N and Singh MF (2012). Spectrum of pharmacological activities from *Bauhinia variegata*: a review. *J Pharm Res.*, **5**(2): 792-797.
- Orwa C, Mutua A, Kindt R, Jamnadass R and Simons A (2009). Agroforestry database: a tree species reference and selection guide version 40. World Agroforestry Centre ICRAF, Nairobi, KE.
- Pahwa S, Mazumder R and Bhattacharya S (2011). Evaluation of *In vitro* antimicrobial activity of different parts of *Bauhinia variegata* Linn. *Int J Pharm Technol Res.*, **3**(4): 1971-1977.
- Pani SR, Mishra S, Sahoo S and Panda PK (2011). Nephroprotective effect of *Bauhinia variegata* (Linn) whole stem extract against cisplatin-induced nephropathy in rats. *Indian J Pharmacol.*, **43**(2): 200-202.
- Parekh J, Karathia N and Chanda S (2006). Evaluation of antibacterial activity and phytochemical analysis of *Bauhinia variegata* L bark. *Afr J Biomed Res.*, **9**(1): 53-56.
- Paudel PK, Bhattarai BP and Kindlmann P (2012). An overview of the bio-diversity in Nepal. In: Kindlmann P (ed) Himalayan biodiversity in the changing world Springer Netherlands, pp. 1-40.
- PIER (2014). Pacific Islands Ecosystems at Risk Honolulu USA: HEAR, University of Hawaii. Retrieved 2019 June 14.
- Pokhrel NR, Adhikari RP and Baral MP (2002). *In-vitro* evaluation of the antimicrobial activity of *Bauhinia variegata*, locally known as koiralo. *World J Microbiol Biotechnol.*, **18**: 69-71.
- Rajani GP and Ashok P (2009). *vitro* antioxidant and antihyperlipidemic activities of *Bauhinia variegata* Linn. *Indian J Pharmacol.*, **41**(5): 227-232.
- Raj Kapoor B, Jayakar B and Muruges N (2003) Antitumour activity of *Bauhinia variegata* on Dalton's ascitic lymphoma. *J Ethnopharmacol.*, **89**(1): 107-109.
- Roqaiya M, Begum W and Jahan D (2015). A review on pharmacological property of *Mimusops elengi* Linn. *Int J Herb Med.*, **2**(6): 24-30.
- Sahu G and Gupta PK (2012). A review on *Bauhinia variegata* Linn. *Int Res J Pharm.*, **3**(1): 48-51
- Samant SS, Kishor K, Upreti BM, Bharti M, Bohra N, Sharma P and Tewari LM (2014). Diversity, distribution, indigenous uses and conservation prioritization of the economically important floristic diversity in Nadaun Block of Hamirpur District, Himachal Pradesh. *Int J Biodivers Conserv.*, **6**(7): 522-540.
- Shah B, Shah N, Megha R and Dikshit C (2010). Phyto-pharmacological profile of

- Bauhinia variegata*. *Pharmacology* **2**: 829-837.
- Shahana S and Nikalje APG (2017). A brief review on *Bauhinia variegata*: phytochemistry, antidiabetic and antioxidant potential. *Am J Pharmtech Res* **7**(1): 186-197.
- Shamran DJ, Al-Jumaili EFA and Tawfeeq AT (2020). Cytotoxicity effect of glucokinin isolated from *Bauhinia variegata* against several cancer cell lines. *Iraqi J Biotechnol.*, **19**(1): 69-74.
- Sharma RK, Rajani GP, Sharma V and Komala N (2011). Effect of ethanolic and aqueous extracts of *Bauhinia variegata* Linnon gentamicin- induced nephrotoxicity in rats. *Indian J Pharm Educ.*, **45**(2): 192-198.
- Sharma RN and Saxena VK (1996). *In vitro* antimicrobial efficacy of leaves extracts of *Bauhinia variegata*. *Asian J Chem.*, **8**(4): 811-812.
- Sharma S and Kumar A (2012). Tribal uses of medicinal plants of Rajasthan: Kachnar. *Int J Life Sci Pharma Res.*, **2**(4): 69-76.
- Sharma, K., Kumar, V., Kumar, S and Sharma R (2020). *Bauhinia variegata*: a comprehensive review on bioactive compounds, health benefits and utilization. *Adv Tradit Med.*, **21**: 645-653.
- Shirkande AA and Shirkande AS (2016). Kovidar-A holistic ayurvedic approach. *Int J Adv Ayurveda Yoga Unani Siddha Homeopat.*, **5**(1): 310-321.
- Singh AK, Raghubanshi AS and Singh JS (2002). Medical ethnobotany of the tribals of Sonaghathi of Sonbhadra district, Uttar Pradesh, India. *J Ethnopharmacol.*, **81**(1): 31-41.
- Singh KL, Singh DK and Singh DK (2016). Multidimensional uses of medicinal plant Kachnar (*Bauhinia variegata* Linn). *Am J Phytomed Clin Ther.*, **4**(02): 58-72.
- Singh N, Singh A and Pabla D (2019). A review on medicinal uses of *Bauhinia variegata* Linn. *Pharma Tutor.*, **7**(6): 12-17.
- Singh RS and Pandey HS (2006). Two new long chain compounds from *Bauhinia variegata* Linn. *Indian J Chem.*, **45B**(9): 2151-2153.
- Space JC, Waterhouse BM, Miles JE, Tiobech J and Rengulbai K (2003). Report to the Republic of Palau on invasive plant species of environmental concern. USDA Forest Service, Honolulu, vol 179.
- Sudheerkumar K, Seetaramswamy S, Babu KA and Kumar PK (2015). Phytopharmacognostical and isolation of chemical constituents from *Bauhinia variegata* leaf extract. *J Pharmacogn Phytochem.*, **4**(1): 189-191.
- Tripathi AK, Gupta PS and Singh SK (2019). Antidiabetic, anti-hyperlipidemic and antioxidant activities of *Bauhinia variegata* flower extract. *Biocatal Agric Biotechnol.*, **19**(8): 101142.
- Wassel G and Ammar SA (1989). Seed proteins of selected *Bauhinia* species and their haemagglutinating effect. *Herba Hungarica* **23**(1-2): 123-125.
- Yadav JP, Kumar S and Siwach P (2006). Folk medicine used in gynaecological and other related problems by rural population of Haryana. *Indian J Tradit Knowl.*, **5**(3): 323-326.
- Yadava RN and Reddy VMS (2003). Anti-inflammatory activity of a novel flavonol glycoside from the *Bauhinia variegata* Linn. *Nat Prod Res.*, **17**(3): 165-169.
- Zhao YY, Cui CB, Cai B, Han B and Sun QS (2005). A new phenanthraquinone from the stems of *Bauhinia variegata* L. *J Asian Nat Prod Res.*, **7**(6): 835-838.