

Medicinal Plant Review: *Bharangi* (*Clerodendrum serratum*)

¹Dr. Abhijeet D. Kumbhar, ²Dr. Shamal S. Naikare.

¹Assistant Professor, ²Medical Officer, ³Assistant Professor

¹Department of DravyaGuna, SAS Ayurvedic Medical College, Harhua, Varanasi.

²Zilla Parishad Ayurvedic Dispensary, Nerle, Tal. Vaibhavwadi, Dist. Sindhudurg, Maharashtra.

Abstract:

Imbalance of *Doshavatha* leads to various diseases formation in human body including Non Communicable Diseases. Change in lifestyle and diet of common people has important role in disease formation. Among diseases present, there are many diseases which doesn't has proper treatments available for complete cure.

Whereas Ayurveda is a complete system of holistic medicine, in which a number of drugs with multiple beneficial actions are mentioned but scientific research is required to prove the effects of the drugs.

Bharangi (*Clerodendrum serratum*) is a well-known drug mentioned in Ayurveda used for various purposes by *Acharya Charaka*, *Acharya Sushruta*, *Acarya Vagbhata* and most of *Nighantus* in Ayurvedic literature also some *Nighantus* has specifically mentioned uses of *Bharangi*.

Hence, plant *Bharangi* is been selected for complete Medicinal Plant Review a step towards standardization Ayurvedic Medicinal Plant.

Index Terms: *Bharangi*, *Clerodendrum serratum*, Ayurveda, Medicinal Plant

Introduction:

Bharangi is commonly found herbal drug in the most of the places. It is commonly used in many preparations as a main drug and used for many diseases. It show therapeutic index as anti-bacterial, anti-helminthic, anti-inflammatory activity. It has *krimighna* activity according to *Raj Nighantu*¹. It is also used as *Jwarghna*, *Shothaghna* and used in treatment of *Shwasa*, *Kasa*.

It is mentioned in *Pippalyadi Gana* by *Acharya Sushruta* and has been used for *Granthi*, *ApaChi*, *Arbud*, *Arochaka*, *Kasa*, *Shwasa*, *Shotha* and *Jwara*.

Root is the part used for *Bharangi*.

Literature Review:

Literature review of *Bharangi* (*Clerodendrum serratum*.) was done from Vedas upto recent works to obtain thorough knowledge about *Bharangi*.

Brihatrayis:

In *Charaka Samhita*² it is mentioned and used in *Prameha* as a content of *Lodhrasava* (*Chi.6/42*), *Kushta* as a content of *Kanakshiri taila* (*Chi.7/11*), *mool churna* is used as *pradhamana nasya* in *Apasmara* (*Chi.10/20*), in *Pandu* as a content of *Vyoshadi Ghrita* (*Chi.16/120*), in *Hikka* and *Shwasa* as *Bharangi-nagaradi yoga*(*Chi17/110*), in *Kasa* as a content of *Chitrakadi lepa* (*Chi.18/54*) and *Agastiharitaki*(*Chi.18/58*).

In *Susruta Samhita*³ *Bharangi* is mentioned in *Arkadi gana*, *Pippalyadi gana* and *Samshamaniya Varga* and used for wound in *Prahemapidaka* as a content of *Dhanvantari Ghrita* (*Chi.12/5*), in *Vatagranthi* (*Chi.18/5*), *Pakva vrana* *Chi.18/40*), *Kaphapittaj jwara* as *Bhargyadi kwatha* (*U.39/197*), *Shwasa* as a content of *Shrungyadi Ghritam* (*U.51/21*), in *Shwasa* as *Bhargyadi Leha*(*U.51/44*), *Kasa* as a content of *Agastyavaleha* (*U.52/43*) and in *Apasmara* as *Bhargyadi Suraprayoga* (*U.61/38-40*).

In *Ashtanga Hridaya*⁴, it is mentioned in *Arkadi Gana*, *Surasadi Gana* and *Vatsakadi gana* and used for *Kasa* as a content of *Kantakari Ghrita* (*Chi.3/62*), *Bharangi churna* is used in *Shwasa* (*Chi.4/32*), in *Prameha Chikitsa* as a content of *Lodhrasava* (*Chi.12/25*), use of *mool churna* is indicated in *Arsha* treatment (*Chi.8/49*), *Bhargyadi Churna* is indicated in treatment of *Gulma* treatment (*Chi.14/21*), in *Apasmara* as a content of *Mahapanchagavya Ghrita* (*U.7/21*) and in *Shiroroga* as a content of *Mahamayur Ghrita* (*U.24/51*).

*Acharya Chakrapani*⁵ has mentioned *Bharagyadhi Kwatha* in *Jwara* treatment (1/180).

Nighantu

*Bhavaprakasha Nighantu*⁶ has mentioned *Bharangi* in *Haritakyadi varga* and mention its uses in diseases like cough, oedema, *asthama* and *fever*.

*Priya Nighantu*⁷ has mentioned *Bharangi* in *Shatapushpadi varga* and mentioned its uses in cough, oedema, asthma and coryza.

*Dhanvantari Nighantu*⁸ has mentioned *Bharangi* in *Guduchyadi varga* and its uses in cough, oedema and asthma.

*Madanpal Nighantu*⁹ has mentioned its uses in cough, oedema, asthma and fever.

*Raj Nighantu*¹⁰ has mentioned *Bharangi* in *Pippalyadi varga* and mentioned its uses in *shofa*, *vrana*, *daaha* and *jwara*.

*Kaiyadeva Nighantu*¹¹ has mentioned *Bharangi* in *Aushadhi varga* and mentioned its uses in *jwara*, *shwasa*, *kasa*, *shofa*, *pinasa*, *aruchi*, *gulma*, *yakshma*.

Synonyms:

- *Angarvalli* - This plant will appear like red hot coal (in colour) when fully blossomed.
- *Kharashaka* - Its leaf is rough in texture.
- *Padma* - Its flowers are red coloured like lotus.
- *Barbari* - It surrounds the diseases from all directions and destroy.
- *Baleya Shaka* - It is mainly eaten by Donkeys.
- *Brahmani* - It is pure as like Brahman
- *Brahamanyashtika* - Its stem is suppose like similar to stick of brahma or Brahman
- *Bhargi* - It destroys the diseases like swasa, kasa etc. or it is filled with the power equivalent to sun.
- *Hanjika* - It cures many diseases like swasa kasa etc.

Vernacular names¹²:

Language	Names
Latin	<i>Clerodendrum serratum</i>
Sanskrit	<i>Bhargi</i>
Bengali	<i>Bamun hatee</i>
Gujrati	<i>Bharangee</i>
Hindi	<i>Bharangi, Barangi</i>
Marathi	<i>Bharangi</i>
Orrisi	<i>Chinda, Penjura</i>
Kannada	<i>Gantabarangi, Kirithaggi, Kiritekki</i>
Mallyanam	<i>Cerytekki, Cherutekku</i>

Pharmacodynamics:

- *Rasa* : Tikta, Katu
- *Veerya* : Ushna
- *Vipaka* : Katu
- *Guna* : Ruksha, Laghu
- *Prabhva* - Krimighna

Scientific Classification¹³:

Kingdom	Plantae
Division	Angiosperms
Class	Magnoliopsida
Subclass	Lamiidae
Order	Lamiales
Family	<i>Verbinaceae</i>
Genus	<i>Clerodendrum</i>
Species	<i>Serratum</i>

Distribution¹⁴:-

More or less throughout india, in forest up to 1500m altitude. Tarai region of Himalaya, specially Nepal, Kumaon, Bihar, western and southern India. Most of the species occurring in tropical Africa and southern Asia. The plant is distributed over scrub forest throughout the tropical and sub-tropical regions up to 1500m. Particularly in Bengal, Orissa.

Botanical Description^{15,16}:**Macroscopic:**

Clerodendrum serratum is slightly woody shrub with bluntly stems and branches. This tree are about 2-8 ft high. It is annual or perennial. Usually aromatic.

- 5cm thick, external surface light brown having elongated lenticles.
- Root: mature root hard, woody, cylindrical; upto
- wood which shows marked medullary rays and concentric growth rings in a transversely cut surface; short fractures; acid taste.
- Bark: usually quadrangular(four-angled)
- Leaf: leaves usually three at a node sometimes
- They are bisexual, zygomorphic, rarely sub-actinomorphic, and bracteolate or not. Corolla with a slender tube, lobe-5, spreading; stamens epipetalous 4 or 2 free; anther 1 or 2 celled usually dehiscent longitudinally; disc persistent. Ovary superior, 2 celled and each cell 2- ovuled and style sub-terminal and gynobasic.
- Flowers: blue, many in long cylindrical thyrsus.
- Fruits: four lobed purple drupe.
- Seeds: with or without endosperm.

Microscopic:

- pentarch and cork cambium arises in second layer of cortex giving rise to stratified cork, 16-20 cells thick xylem fibers are long with pointed, forked ends. Starch is absent.
- Primary root: the primary root is tetrarch to
- secondary phloem interspersed with sclereids and ring porous xylem. Starch grains occur in medullary rays and xylem parenchyma and are similar to those found in phloem parenchyma. Acicular crystals of calcium oxalate are scattered in medullary rays and xylem parenchyma cells. Powder
- Root: the root is characterized by stratified cork,
- with pungent odour and an acrid taste. Shows vessels reticulate, spiral and with bordered pits, starch grains simple and compound, round to oval measuring up to 20 micro in India and acicular crystals stone cells as describes under
- Powder characters: is yellowish brown in color
- Leaf: leaf shows a few uniseriate covering
- trichomes around margine and over large veins and occasional glandular trichomes on both surfaces. Vascular bundles capped with groups of fibers are seen in more or less continuous cylinder at basal region of midrib and are gradually reduced to single strand at apex.

Figure No.1
Bharangi



Figure No.2 Bharangi roots



Chemical composition^{15,16}:

- Root of plant- saponins, D- mannitol, stigmasterol, oleanolic acid, queretaroic acid, serratagenic acid, sitosterol, clerosterol identified as 5, 25- stimastadien-3beta o, clerodone as 3beta-hydroxyl-lupan 12- one, B- sitosterol, lupeol, A steroidal glycosides, phytosterols, ferulic acid, arabinose, scutellarcin, baicalein, serration and ursolic acid.
- Leaf of plant- catChin, alpha-spinosterol, luteoline, polyphenolics, diterpin-clerodin, ethycholesta-5,24 25-trine 3beta-o hispiduline and 7-o-o gluconoids of hispidulin and cruteuarein

Medicinal Uses¹²:

Deepana, Kaphahara, Pachana, Ruchya, Vatahara, Shwasahara

Doses¹²:

Root Powder : 3-6 Grams

Root kwatha : 10-20 g. of kwathaurna.

Adulterant¹⁵:

Clerodendrum indicum is used as *Bharangi*. *Clerodendrum indicum* is known in Bengal as *Bamanhati* and in telgu it is known as *Bharangi*. The bark of *Gardenia turgid roxb.* Is reported to be sold as *Bharangi* bark. *Picrasma quassioides benn.* is used as *Bharangi* in Bengal. *Bharangi* root is sometimes substituted by *Ringani* or *Kantkari* root (*Solanum surattense* Burm. f.)

Pharmacological studies:

- **Alpha glycosidase inhibitory activity¹⁷:** Methanolic extract of *Clerodendrum serratum* roots (100µg/ml) was evaluated for alpha glycosidase inhibitory activity using enzyme assay. The enzyme was not found significantly effective (32.3% inhibition with IC₅₀ value 265±9 µg/ml) and may require higher dose to produce the effect (Bachhawat et al., 2011).
- **Wound healing activity¹⁸:** Wound healing activity is carried out on the ethanolic extracts of root and leaves of *Clerodendrum serratum* were and it was evaluated on Albino Rats. The results showed higher wound healing potency of the root extract as compared to the leaf extract. As compared with the control both the extracts demonstrated significant wound healing activity (Vidya et al., 2005)
- **Antioxidant activity¹⁹:** In DPPH radical scavenging assay, ethenolic extract of root at various concentrations (50, 100, 150, 200, 250 µg/ml) and ascorbic acid (50, 100, 150, 200, 250 µg/ml) showed the significant inhibitory activity with IC₅₀ value 175 and 137 respectively. In reducing power assay, concentration 20-120 µg/ml shows a linear increase in reducing power, equivalent to 20 -120 µg/ml ascorbic acid. Presence of hydrophilic polyphenolic compounds is responsible to gives the greater reducing power. The IC₅₀ values were 48 and 85 for ascorbic acid, ethanolic extract of CSR respectively. The inhibition of 73.32 ± 0.002%, and 64.49 ± 0.242% was observed for standard and ethanolic root extrat (test) respectively at maximum concentrations (Bhujbal et al., 2009).
- **Antiasthamatic activity²⁰:** Alcoholic root extract of *Clerodendrum serratum* of 100 and 200 mg/kg showed antiasthamatic activity in ovalbumin induced experimental mice. In this model the antiasthamatic activity is probably acting through inhibition of inflammatory mediators like histamine, serotonin and prostaglandins due to cyclooxygenase inhibitors (Thalla et al., 2012).
- **Anticancer activity²¹:** Aqueous and methanolic extract of roots of *Clerodendrum serratum* were screened using Dalton's Lymphoma Ascites (DLA) cell model at the dose 100 mg and 200 mg/kg body weight for in vivo anticancer activity. The parameters were analysed mean survival time, body weight analysis, percentage increase in life span, haematological parameters and biochemical parameters. As compared to aqueous extract methanolic extract exhibit significant anticancer activity (Zalke et al., 2010).
- **Anti-inflammatory activity²²:** Anti-inflammatory activity is carried out on the carrageenan induced edema in rats. The ethanolic root extract of *Clerodendrum serratum* showed significant anti-inflammatory activity, and also in the cotton pellet model in experimental mice, rats and rabbits at concentrations of 50, 100 and 200 mg/kg (Narayan et al., 1999).
- **Spermatotoxic activity²³:** Methanolic extract of *Clerodendrum serratum* at dose 100, 300 and 500 mg/kg shows significant spermatotoxic activity in male albino rats. The *Clerodendrum serratum* treatment result in impairment of male fertility in the rat by both spermatogenesis and caudaepididymal spermatozoa (Sarathchandiran et al., 2014).
- **Antiulcer activity²⁴:** The methanolic extract of *Clerodendrum serratum* root (200mg/kg) possess significant antiulcer activity in a dose dependent manner by improving gastric mucosal defence mechanism. It shows significant decrease in number of ulcer, ulcer score and ulcer index in ethanol induced ulcer (Sharma and Gupta, 2013).

Conclusion:

On comprehensive review of *Bharangi* it is found that *Bharangi* is described in Vedas, Brihatrayies & Laghutrayies. Various synonyms like *Angarvall*, *Kharashaka*, *Padma*, *Barbari*, *Baleya Shaka*, *Brahmani*, *Brahamanyashtika* and *Hanjika* are described in various *Nigantus*. *Bharangi* (*Clerodendrum serratum*) belongs to family *Verbenaceae*. It is used in traditional ayurvedic medicine as antihelminthic, antipyretic, Kasahara and Shwasahara

Bharangi is having *Ruksha*, *Laghu Gunas*, *Tikta - Katu rasa*, *Ushan Veerya and Katu Vipaka*. On account of above properties it is *Kaasaghna*, *Shwasaghna*, *Shothaghna*, *Jwarahara*, *Gulmaghna*, *Bhramahara*, *Vrananashaka*, *Krimighni*, *Dahahara*, *Kshayahara*, *Hikkahara*, *Yakshmanashaka* and *AruChighna*.

References:

1. Acharya Narahari Pandit, Raj Nighantu. Ed. Indradeva Tripathi, 2003. 3rd ed. Varansi:Chaukhambha Krishnadas Academy.
2. Agnivesa revised by Charaka & Dridhabala, Charaka *Samhita*. Ed. Vidyadhar Shukla, Prof. Ravidatta Tripathi, Vol I,II. 2006. Revised ed. Delhi:Chaukhambha Sanskrit Pratisthan.
3. Acharya Susruta, Sushruta Samhita. Ed. Dr. Anant Ram Sharma, Vol I,II,III. 2001. 1st ed. Varanasi:Chaukhambha Sanskrit Pratisthan.
4. Acharya Vagbhata, Ashtanga Hridayam. Ed. Vd. Vaidya Yadunandan Upadhyay, 2000. 13th ed. Varanasi:Chaukhambha Sanskrit Sansthan.
5. Chakrapanidatta, Chakradatta. Ed. Indradeva Tripathi, 1997. 3rd ed. Varansi:Chaukhambha Sanskrit Sansthan.
6. Bhavamishra, Bhavaprakasha Nighantu. Ed. Krishnachandra Chunekar,1998. Reprint. Varanasi:Chaukhambha Bharati prakashan.
7. Acharya Priyavata Sharma, Priya Nighantu. 1983, 1st ed. Varanasi:Chaukhambha Surbharati prakashan.
8. Dhanvantari, Dhanvantari Nighantu. Ed. Dr. Jharakhanda Oza & Dr. umakripa Mishra, 1982, 2nd ed. Varanasi:Chaukhambha Surbharati prakashan.
9. Nripamadanapala, Madanapala Nighantu. Ed. Pandit Haridas Tripathi. 2009. 1st ed. Varanasi:Chaukhambha Krishnadas Academy.
10. Acharya Narahari Pandit, Raj Nighantu.2003. Ed. Indradeva Tripathi, 3rd ed. Varansi:Chaukhambha Krishnadas Academy.
11. Kaiyadeva, Kaiyadeva Nighantu. Ed. Acharya Priyavat Sharma & Guruprasad Sharma, 1979, 1st ed. Varanasi:Chaukhambha Vishwabharati.
12. Ayurvedic Pharmacopia of India, Part 1, Vol.III, 2004. Ministry of Health & Family Welfare, Dept. of AYUSH, Govt. of India.
13. *Clerodendrum serratum*, Available from: URL: http://en.wikipedia.org/wiki/clerodendrum_serratum
14. Ayurvedic Pharmacology And The Therapeutic Uses Of Medicinal Plant (Dravyagunvignyan), edited by Vaidya Vishnu Mahadev Gogte, S. Ramakrishnan,2000, First English Edition, Bhartiya Vaidya Bhavan, Mumbai.
15. Database on Medicinal Plants, edited by P. C. Sharma, M. B. Yelane, J. J. Dennis, assisted by Aruna Joshi, Y. S. Prabhune, G. B. Borkar, D. P. Sharma, P. B. Singh.,2002, Reprinted Edition, Central Council For Research In Ayurveda and Siddha (Dept. Of ISM and H, Ministry of Health And Family Welfare, Gov. Of India).
16. http://www.ijrap.net/admin/php/uploads/997_pdf.pdf
17. Bachhawat, A., Sham, M. and Trimurugan, K. 2011. Screening of fifteen Indian Ayurvedic plants for alpha-glucosidase inhibitory activity and enzyme kinetics. International Journal of Pharmacy and Pharmaceutical Sciences.
18. Vidya, S., Krishna, V., and Manjunathan. 2005. Micropropagation of *Clerodendrum serratum* from leaf extracts. Journal of non-timber Forest Products.
19. Bhujbal, S., Kewatkar, S., More, L., and Patil, M. 2009. Antioxidant effect of root of *Clerodendrum serratum* Linn.
20. Thalla, S., Tammu, S., Pentela, B., and Thalla, S. Antiasthmatic activity of alcoholic extract of *Clerodendrum serratum* induced by ovalbumin. International Journal of Chemical and Pharmaceutical Sciences.
21. Sharma, M., and Gupta, A. 2013. Preliminary phytochemical investigation of methanolic root extract of *Clerodendrum serratum*: anticancer activity and histopathological study of stomach mucosa of wistar rats in ethanol induced ulcer.
22. Nrayan, N., Thirugnanasambantham, P., Viswanathan, S., Vijayasekaran, V., and Sukumar, E. 1999. Antinociceptive, Anti-inflammatory and Antipyretic effect of ethanolic extract of *Clerodendrum serratum* root in experimental animals. J Ethnopharmacology.
23. Sarathchandiran, I., Kadalmani, B., and Navaneethakrishnan, S. 2014. Evaluation of *Clerodendrum serratum* in male albino rats. International Journal of Biological and Pharmaceutical Research.
24. Sharma, M., and Gupta, A. 2013. Preliminary phytochemical investigation of methanolic root extract of *Clerodendrum serratum*: anticancer activity and histopathological study of stomach mucosa of wistar rats in ethanol induced ulcer.