WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 9, Issue 12, 229-236. Review Article ISSN 2277– 7105

A REVIEW ON PHYTOCHEMICAL AND PHARMACOLOGICAL ACTION OF *CLERODENDRUM SERRATUM* LINN. (BHARANGI)

Gauri Dongare*[1], Akshada Kale[2], Pranali Band[3], Ashwini Chavan[4], Dr. A. N. Aher[5] and Sonali Gawali[6]

[1,2,3,4]PG Student, Mvp's College of Pharmacy, Nashik, Maharashtra, India.

[5]Pharmacognosy Hod, Mvp's College of Pharmacy, Nashik, Maharashtra, India.

[6]Assistant Professor, Mvp's College of Pharmacy, Nashik, Maharashtra, India.

Article Received on
10 August 2020,

Revised on 30 August 2020,
Accepted on 20 Sept. 2020,

DOI: 10.20959/wjpr202012-18754

***Corresponding Author**
Gauri Dongare
PG Student, Mvp's College of Pharmacy, Nashik, Maharashtra, India.

ABSTRACT

CLERODENDRUM SERRATUM LINN. (family: Verbenaceae) is wild plant found in tropical and subtropical regions in the world. It is known as Bharangi in some regions of India. In Ayurveda it is used to cure various disorders like shwasa (breathlessness), kasa (cough), vrana (wound), shotha (swelling) and various vataja disorders (neurological disorders). Different parts of *CLERODENDRUM SERRATUM* such as leaves, stem, roots, seeds, flowers contain various phyto-constituent such as carbohydrates, phenolics, flavonoids, terpenoids, steroids, saponins etc. and posses different pharmacological activities such as anti-asthmatic, anti-allergic, anti-cancer, anti-oxidant, anti-bacterial, anti-inflammatory, anti-pyretic, hepatoprotective and immunomodulatory activities etc. The plant use as a vegetable in most of regions of India because of wide range of pharmacological activities. This review is deals with identification, medicinal values, phytochemical and pharmacological action of different part of *Clerodendrum Serratum*.

KEYWORDS: *Clerodendrum Serratum*, Bharangi, Pharmacological, Phytochemical.

INTRODUCTION

According to World Health Organization (WHO), medicinal plants are the best source to obtain a variety of drugs. About 80% of peoples from developed countries use traditional medicine, which has compound derived from medicinal plants. Therefore, such plants should be investigated to better understand their properties, safety and efficiency. India's use of

plants for health care dates back close to 5000 years. About 8000 herbal remedies have been codified in the Ayurveda, which is still in use in many dispensaries today.[2]

CLERODENDRUM SERRATUM Linn. belongs to family of Verbenaceae.[3] The genus Clerodendrum is a diverse genus with about 560-580 species of small tree, shrub or occasionally perennial herbs mostly in the tropics and subtropics of the old word. Around 18 formulations containing Clerodendrum serratum root used for treatment of various ailments indicated in traditional literature and Ayurvedic pharmacopoeia of India.[8] The parts used are the root and leaf. Its roots are bitter, acrid, thermogenic, anti-inflammatory, digestive, carminative, stomachic, anthelmintic, depurative, expectorant, sudorific, antispasmodic, stimulant and febrifuge and are useful in inflammations, dyspepsia, anorexia, colic, flatulence, helminthiasis, cough, asthma, bronchitis, hiccough, tumors, tubercular glands, dropsy, consumption, chronic inflammation of the nose, skin diseases, leucoderma, leprosy and fever. Leaves are useful as an external application for cephalalgia, and ophthalmia. The root increases appetite, lessens expectoration. Seeds bruised and boiled in buttermilk are used as aperient and in dropsy.[3]

Taxonomy[4]

Kingdom : Plantae

Division : Angiosperms

Class : Magnoliopsida

Subclass : Lamiidae

Order : Lamiales

Family : Verbinaceae

Genus : Clerodendrum

Specie : Serratum

Vernacular Name[1]

Bengali: Bamunhatee, Bamanhatee, Bhuijam

English: Blue glory, Beetle killer

Gujarati: Bharangee

Hindi: Bharangi

Kannada: Gantubarangee

Malayalam: Cheruthekku

Marathi: Bharangee, Bharang

Oriya: Chinds

Punjabi: Bhadangee

Sanskrit: Angaravalli, Padma, Brahmanayashtika, Barbura

Tamil: Cheruteku

Telugu: Ganttubrarangee

Urdu: Bharangi, Baharangi

Synonyms[5]

Padma-flowers resemble lotus flowers

Bharangi-it destroys disease, and it is having power equivalent to sun

Kasagni-relieves kasa

Vatari- useful in Vata disorders

Morphological characters

1. Leaves: Leaves are usually three at a node. The leaves are opposite oblong or elliptic, and acute at base.
2. Root: Root are 5 cm thick, cylindrical, hard, woody and light brown in colour.
3. Steam: Usually quadrangular.
4. Flower: Flowers are arranged in dichotomous cymes, purple in colour.
5. Fruit: Four lobed.
6. Seed: With or without endosperm.[8]

Ayurvedic Properties and Action on Kapitha

1. Rasa (tast) : Tikta (bitter) , Katu (pungent)
2. Veerya (Energy) : Ushna (hot)
3. Vipaka (transformed state after digestion): Katu (pungent)
4. Guna (qualities) : Ruksha (dry), Laghu (light)
5. Prabhava (effect) : Balances kapha and vata dosha.[4]

Traditional uses

1. Roots of Bharangi are pungent, bitter, acrid and useful as carminative, depurative, expectorant, anti-spasmodic, stimulant, appetizer and anthelmintic.
2. Roots are reported to be used clinically for the treatment of bronchitis, asthma, fever, blood diseases, tumours, inflammations, burning sensation, epilepsy, malaria, ulcer and wounds.

3. The decoction of root is extremely effective in edema over body, especially due to kapha and used in worm infestations.
4. The root paste has been applied on the forehead to alleviate headache.
5. Leaves are used as a vegetable and in fever, malarial fever and hiccough in Konkan region.
6. Externally the leaves are used for cephalgia and ophthalmia while the pulp is used to mitigate the glandular swellings and hasten the wound healing.
7. The juice of leaves is applied on the lesions in erysipelas.[6]

Phytoconstituents of Different Parts of Plant

Table 01: Phytoconstituents Of Different Parts.[1,4,6,7]

SR NO.	PART	CHEMICAL CONSTITUENTS
1	ROOT	**Carbohydrates :** D-mannitol[4] **Terpenoids** : Serratagenic acid, Oleanolic acid, Queretaratic acid, Ursolic acid, Serratin[7] **Flavonoids** : Aspigrnin-7-glucoside[6] **Steroids** : γ-sitosterol[7] **Saponins**[4]
2	LEAVES	**Terpenoids :** Serratin, Lupeol[6] **Flavonoids :** Catchin, Hispidulin, Cleroflavone, Luteoline[4] **Steroids :** α-spinosterols[4]
3	STEAM	**Cabohydrates :** sugar **Terpenoids** : Ursolic acid **Steroids** : β-sistosterol, Spinasterol **Flavonoids** : 5-hydroxy-7,4-dimethoxy flavone[6]

Pharmacological Activity

Anti-asthmatic activity

The hydroalcoholic extract of *Clerodendrum serratum* could effective against asthmatic condition, which reduced the total and differential WBC cell count in BALF, retained protein and MDA level in lung tissue, increased intact mast cells thus preventing its degranulation and mediators release. Hence hydroalcoholic extract of *Clerodendrum serratum* formulation is could be a promising new therapeutic approach for the treatment of clinical asthma.[9]

Hepatoprotective activity

The ethanolic extract of *Clerodendrum serratum* roots and isolated ursolic acid from it were evaluated for hepatoprotective activity against carbon tetrachloride induced toxicity in male Wistar strain rats. The 20 mg/kg/day per orally of ethanolic extract and 10 mg/kg/day per

orally of ursolic acid concomitantly for 14 days gave to rat. It shows that the hepatoprotective activity of constituent ursolic acid extracted from roots of *Clerodendrum serratum* is significant as similar to the standard drug and showed more significant hepatoprotective activity than crude extract.[10]

Anticancer activity

The aqueous and methanolic extract of *Clerodendrum serratum* evaluated for anticancer activity against swiss albino mice. Mice were treated with 100mg/kg/day and 200mg/kg/day extract for 14 days. The parameters studied were mean survival time and %ILS, Body weight anlysis, Hematological parameters such as WBS, RBC, Hb count and Biochemical parameters such as ALAT, ASAT and total protein activity. The study confirmed that the methanolic extract of *Clerodendrum serratum* showed significant anticancer activity at dose of 100mg/kg/day and 200mg/kg/day.[11]

Antibacterial activity

The volatile oil of bark of *Clerodendrum serratum* used for antibacterial activity against Gram (+) bacterial strains; Methicillin-resistant Staphylococcus aureus (MRSA), Methicillin-sensitive Staphylococcus aureus (MSSA) and Gram (-) bacterial strains; Escherichia coli (E. coli), Proteus spp. By using Agar well diffusion method. The bacteria MRSA, MSSA, E. coli, Proteus spp. showed zone of inhibition at dose 200µL. Hence, study confirmed that the volatile oil of bark of *Clerodendrum serratum* showed antibacterial activity.[12]

Antioxidant activity

The aqueous extract of *Clerodendrum serratum* has significant antioxidant activity against DPPH scavenging assay, superoxide scavenging assay and FRAP assay. Different conc. (20-100 µ/mg) of extract were used. Plant exhibits the antioxidant activity through the scavenging of free radicals, and FRAP showed significant reducing power activity with increased concentration of the sample therefore, the aqueous extract of *Clerodendrum serratum* showed significant antioxidant activity.[13]

Anthelmintic activity

The water extract of *Clerodendrum serratum* used for Anthelmintic activity against earth worm. The earth worm kept in different conc. (100, 200, 300, 400 mg/ml) of water extract. At higher conc. (400mg/ml) extract produced paralysis effect much earlier and the time taken for death was shorter for earth worm as compare to standard. So, use of Leaves of *Clerodendrum*

serratum as an anthelmintic have been confirmed as the root extracts displayed activity against the earth worms.[14]

Wound healing activity

The ethanolic extract of root and leaves of *Clerodendrum serratum* evaluated for wound healing activity against Albino rats. The result showed root extract has higher wound healing activity than leaves extract. As compared with the control both extracts demonstrated significant wound healing activity.[8]

Anti – inflammatory activity

The ethanolic extract of *Clerodendrum serratum* evaluated for anti-inflammatory activity for acute inflammation by using carrageenin-induced paw edema method in rats. Result showed 100 and 200mg/kg dose of extract produced significant reduction in the volume of paw edema in rats. For activity against cronic inflammation cotton pellet implantatiom method in rats is used . result showed weight of cotton pellets significantly reduce as compare to control animal. Hence ethanolic extract showed anti-inflammatory activity.[15]

Anti-pyretic activity

The ethanolic extract of *Clerodendrum serratum* evaluated for anti-pyretic activity against Rabbits. The dose (50, 100, 200 mg/kg per orally) of extract were given to rabbits. Paracetamol 100 mg/kg per orally used for comparison. Rectal temperature recorded very 30 min. for 3 hrs. The reduction in pyrexia after administration of *Clerodendrum serratum* indicates anti-pyretic activity of these plant. It showed activity at higher dose (100 and 200 mg/kg) of extract.[15]

Anti-allergic activity

Activity is performed by using milk induced leucocytosis in mice. Aqueous extract of stem and roots of *Clerodendrum serratum* was gives in LD (130mg/kg, p.o.) and HD (260mg/kg, p.o.) respectively for 14 days. Blood sample were collected and tested leucocytes and eosinophil count. Result showed that at higher dose significant reduction in leucocytes and eosinophil count which indicates this plant were having anti-allergic activity.[16]

CONCLUSION

This review describes the botany, phytochemistry and various pharmacological activities of *CLERODENDRUM SERRATUM*. This plant reported presence of Saponins, Terpenoids,

Flavonoids, Carbohydrates, Steroids etc. The plant found to be useful as anti-asthmatic, anticancer, antioxidant, hepatoprotective, anthelmintic, anti-allergic, wound healing, anti-pyretic and anti-inflammatory which has further scope for clinical trials to treat the diseases.

REFERENCES

1. Ayurvedic Pharmacopoeia of India, 1st edition, The Ayurvedic Pharmacopoeia of India, vol. 3. Government of India, New Delhi, 2001; 25–26.
2. Mukesh Kumar Singh , Clerodendrum serratum : A clinical approach , Journal of Applied Pharmaceutical Science, 2012; 02(12): 11-15.
3. Poornima BS, Prakash L Hegde, Pradeep, Harini A, Pharmacological review on Clerodendrum serratum Linn. Moon, JPP, 2015; 3(5): 126-130.
4. Dr. Abhijeet D. Kumbhar, Dr. Shamal S. Naikare, Medicinal Plant Review: Bharangi (Clerodendrum serratum), IJCRT, 2018; 6(2): 372-376.
5. Dr. Ritesh Kumar Lahoti, Dr. V.G.Huddar, Bharangi - A Review on Itstherapeutic Effects, IJSR, 4(2): 186-188.
6. Jagruti J. Patel, Sanjeev R. Acharya, Niyati S. Acharya, Clerodendrum serratum (L.) Moon. – A review on traditional uses, phytochemistry and pharmacological activities, Journal of Ethanopharmacology, 2014; 1-18.
7. Praveen kumar A., K. Nishteswar, Phyto-chemical and Pharmocological Profiles of Clerodendrum Serratum Linn. (Bharangi): A Review, IJRAP, 2013; 4(2): 276-278.
8. Arifa Dastagir Sangle, Khan Kalimuddin Salahudiin, Padmaja Rao Ayalasomayajula and
9. Imtiyaz Ansari, Phyto-Chemical and Pharmacological Review of Clerodendrum Serratum
10. (Bharangi), International Journal of Current Research, 2016; 8(07): 34338-34341.
11. T. Nageswari, K. Ayesha, B. Kumar and P. Naresh Babu, Evaluation of Hydro Alcoholic Extract of Clerodendrum Serratum Leaf for Anti-Asthmatic Activity, IJPIB, 2017; 2(1): 92-96.
12. S. M. Vidya, B. K. Manjunatha, K. L. Mankani, Manzoor Ahmed and S. D. Jagadeesh Singh, Evaluation of hepatoprotective activity of Clerodendrum serratum L., Indian Journal of Experimental Biology, 2007; 45: 538-542.
13. Ashish S. Zalke, Ashish V. Kulkarni, Devendra S. Shirode, B. Duraiswamy, In vivo anticancer activity of Clerodendrum serratum (L) Moon., Research Journal of Pharmaceutical, Biological and Chemical Sciences, 2010; 1(3): 89-98.
14. Rahat Noreen, Azeem Intisar, Abdul Ghaffar, Farkhanda Jabeen, Muhammad Amin Abid, Muhammad Imran Din, Muhammad Irfan, Faiza Faiz & Tayyaba Sattar, Constituents of

Volatile Oil from Bark of Clerodendrum serratum (L.) and its Antibacterial Activity, Journal of Essential Oil Bearing Plants, 2018; 21(1): 198-205.

15. Raj Kumar Tiwari, Udayabanu M, Silpi Chanda, Evaluation of In Vitro Antioxidant Potential Of Aqueous Root Extract of Clerodendrum Serratum L., Asian Journal of Pharmaceutical and Clinical Research, 2017; 10(4): 402-404.
16. Deepak J Kare, Anthelmintic Activity of Aqueous Leaf Extract of Clerodendrum Serratum, International Journal of Science and Research, 2019; 8(5): 997-1001.
17. N. Narayanan, P. Thirugnanasambantham, S. Viswanathan, V. Vijayasekaran, E. Sukumar, Antinociceptive, anti-inflammatory and antipyretic effects of ethanol extract of Clerodendron serratum roots in experimental animals., Journal of Ethnopharmacology, 1999; 65(3): 237-241.
18. N. K. Bhangare T. A. Pansare, B. B. Ghongane and T. M. Nesari, Screening for anti-inflammatory and anti-allergic activity of Bharangi {Clerodendrum serrratum (Linn.) Moon} in animals, International Journal of Pharma and Bio Sciences, 2012; 3(4): 245–254.