

Carissa Congesta weight. leaves, Traditional Use, Phytochemical Constituents and Phytochemical Screening

Carissa congetsa weight.

¹Darshana Borude (shinde), ²Dr. Ravindra Jadhav, ³Rohit Khairnar

^{1,3} M. Pharm, ²M. Pharm, ph.D

Department of Pharmacognosy,

Pravara Rular College of Pharmacy, Loni, Ahmednagar, India

Abstract – For the treatment of various diseases, the use of various herbal medications, either separately or in combination, has been advised. Different traditional medical systems have acknowledged the ability of the *C. congesta*, also known as "karanda," to treat a variety of ailments. It comprises a number of terpenoids-class phytochemical components. The leaf decoction is useful for treating earaches, diarrhoea, mouth irritation, and intermittent fever. The plant's therapeutic usefulness is attributed to a number of important bioactive components, including acids, glycosides, terpenoids, alkaloids, tannins, and saponins. The herb has historically been used to treat worms, chest ailments, diarrhoea, malaria, and coughs. For treating herpes, infertility, diabetes, asthma, rheumatism, eye cataracts, gastric ulcers, polio, cancer, hypertension, kidney complications, and infections like gonorrhoea, syphilis, sickle-cell anaemia, hernia, rabies, typhoid fever, jaundice, and sexual asthenia in males. It is also used as a cough expectorant. Among all chemical constituents, carissol, carissone, carissanol, olivil, carinol, ursolic acid, and carissone are the key bioactive constituents responsible for pharmacological activities of genus *Carissa*. Apart from this, the plant is evaluated for various pharmacological activities by employing the animal models. The review has been written with the aim to provide a direction for further clinical research to promote safe and effective herbal treatments to cure a number of diseases.

Keywords: *Carissa congesta weight*. Pharmacological activities, Traditional uses,

I. INTRODUCTION

subtropical and tropical Asia, Africa, and Oceania (1). There are about 85 species in the genus, but only eight of them have approved names; the remaining species are either synonyms of these eight or belong to different genera. [2] *Carissa* crowded Wight are Apocynaceae plants. In Malaya it is known as kerenda, in India as karaunda, in South India as Bengal currant or Christ's thorn, in Thailand as namdaeng, and in the Philippines as caramba, caranda, caraunda, and perunkila (3). species is a rank-growing, straggly, woody, climbing shrub that typically reaches heights of 10 to 15 feet (3-5 metres), occasionally reaching the tops of big trees. It also contains a lot of white, viscous latex. Sharp thorns, simple or forked, up to 2 inches (5 cm) long, are positioned in pairs in the axils of the leaves on the numerous, spreading branches that form thick masses. The leaves are opposite, evergreen, oval or elliptic, and 1 to 3 in (2.5-7.5 cm) long. The upper surface of the leaf is dark green, leathery, glossy, and dull on the underside. left in the bud as opposed to right as in other species. They are borne in terminal clusters of 2 to 12, are white with pink undertones frequently. The fruit is oblong, broad-ovoid or round, 1/2 to 1 in (1.25–2.5 cm) long, with smooth, glossy, relatively thin but tough, purplish-red skin that turns dark-purple or nearly black when ripe. The pulp is very acidic to moderately sweet, frequently bitter, juicy, red or pink, and exudes flecks of latex. the Geniiales. It is made up of native evergreen trees or tiny shrubs. There could be two to eight tiny, brown, flat seeds. The karanda is a natural tree that can be found in large parts of India, Burma, Malacca, and dry sections of Ceylon. These regions frequently cultivate it as a hedge and for its fruit, which is sold in communities (4) Due to the presence of biologically active substances such as saponins, cardiac glycosides, phenolic components, flavonoids, alkaloids, and triterpenoids, *Carissa congesta w.* has attracted increased interest as a source of medicine. shape. The roots have cardiac glycosides and salicylic acid, which lower blood pressure a little bit. Moreover, roots contain a number of volatile substances, such as 2-acetyl phenol, carinol, lignan, sesquiterpenes, lupeol, -hydroxybetulinic acid, -sitosterol, -sitosterol glycoside, -amyrin, and des-Nmethylnoracronycine, an acridone alkaloid [5–6]. Sesquiterpene glucoside is abundant in the stem [7]. Triterpenes and tannins were discovered to be present in leaves. Moreover, a brand-new substance called carrissic acid (an isomer of ursolic acid) has been discovered in leaves [8].

II. TRADITIONAL USES

The genus *C. congesta* is well recognised for its use as a traditional medicinal herb in the Indian subcontinent's ayurveda medical system, which dates back thousands of years. Consequently, *C. congesta* has long been used for its customary purposes. *C. congesta* is a common African ethnomedicine and one of the most often used conventional treatments for a wide range of illnesses. Several ailments can be treated with any part of the plant, including the roots, bark, leaves, and even the fruits. Some cultures in Africa refer to *C. congesta* as the "magic herb" since it is a versatile medicinal tree and may treat a variety of ailments,

such as headache, chest discomfort, rheumatism [10–12], gonorrhoea, syphilis, rabies, herpes, and malaria [13]. Sickle-cell anaemia, hernia, edoema, toothache, cough, ulcer, worm infestation [14] and as a diuretic, as well as for the treatment of typhoid fever, jaundice, kidney stone [15], sexual asthenias in males, measles, and as a cough expectorant [16]. The herb can be used to cure other skin conditions as well as chickenpox [17].

Leaves-The traditional birth attendants utilise a decoction made from dried plants to accelerate labour and hasten child delivery, particularly during challenging labour. Like the roots, a decoction from the leaves and bark of *C. congesta* is used in many societies in Africa in the treatment and management of breast cancer, headache, chest pains, gonorrhoea, lowering blood pressure, rheumatism, syphilis, rabies, immune booster, fever, edema, cough, ulcer, malaria [18], and to alleviate dental pain. The tussar silkworm has been fed on the leaves of the karanda tree. In cases of intermittent fever, diarrhoea, mouth irritation, and earaches, the leaf decoction is beneficial [19].

Roots-In some societies, the crushed root's decoction is also used to cure epilepsy. To treat epilepsy, the patient may occasionally be forced to breathe in vapours from a root infusion. Snake repellent and anti-venom are both made from roots and root bark [20,21]. To cure and manage dysentery, the ripe fruits are consumed as snacks. The ripe fruits are used to make chutney, pudding, tarts, and curries. They are turned into jelly when they are just slightly underripe. In India, pickles are created from green, sour fruits. They have been used as an alternative to apples in tarts after the peel and seeds have been removed and they have been spiced with sugar and cloves. The unripe fruit is used as an astringent in medicine. The mature fruit is consumed as a biliousness cure and antiscorbutic. The fruits have been used as tanning and dyeing chemicals. British expatriates in India surely preferred the karanda since it tastes like gooseberries. (9,14)

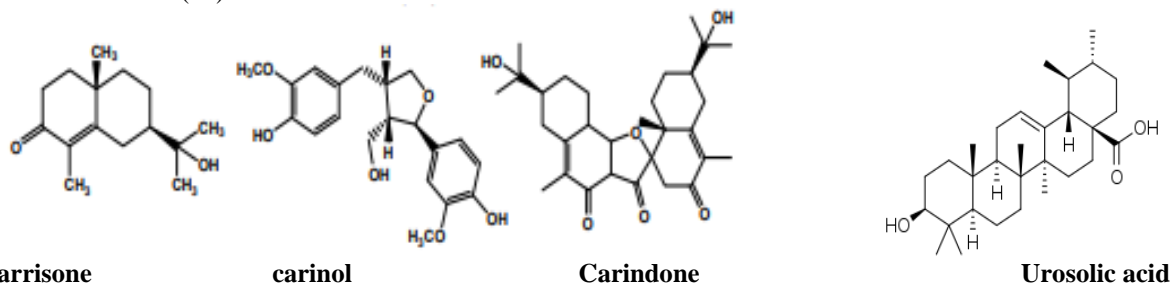
III. PHYTOCHEMICAL CONSTITUENTS

Leaves-In addition to tannins and triterpenoids, it was discovered that a new isomer of urosolic acid called carissic acid was present in the leaves (22, 23). Fresh leaves of *C. congesta* have been shown to contain four pentacyclic triterpenoids, including the newly discovered chemical carissin and two previously unreported substances. The new triterpenoid's structure has been determined to be 3-hydroxy-27-E-feruloyloxyurs-12-en-28-oic acid. On the basis of 2D NMR experiments, the compounds' protons have also been fully assigned (24).

Roots- *C. congesta* roots have produced a variety of volatile compounds, such as 2-acetyl phenol (25, 26). A novel lignan, carinol, from the root of *C. congesta* was reported by Pal et al (27).

A variety of volatile substances, including 2-phenyl ethanol, linalool, -caryophylline, isoamyl alcohol, benzyl acetate, and a novel triterpenic alcohol called carissol, have been found in the fruits of this plant. The plant's polar glycoside was mildly hydrolyzed by enzymes to produce oderoside H, digitoxigenin, and the sugars D-glucose and D-digitalose.

Moreover, *C. congesta* has a 13% crude protein content, 7.8% polyphenols, 5.3% fixed oil, 58% hydrocarbons, and 31.4% free acid. This species' higher gross heat values suggest that it can be utilised as fuel. It was discovered that *C. congesta*'s essential oil contains coumarin (31).



IV. Taxonomy

Kingdom	Plantae
Phylum	Tracheophyta
Class	Magnoliopsida
Order	Gentianales
Family	Apocynaceae
Genus	<u>Carissa</u> L.
Species	<i>Carissa congesta</i>



V. Morphology of Carissa congesta weight

Plant: Thorny shrub, with forked branches, Height: 2–3 m Wood: Very hard;

Leaves:

1. Lateral veins of leaf 3–5 pairs
2. Leaves 2–5 cm long
3. Leaf apex acute or acuminate to apiculate Ovate,
4. 2.5 cm broad, leathery; venation, reticulate pinnate; margin, entire; petiole 3 mm long;
5. leaves exuding a white latex, when plucked from the stem,

Bark: Light brown to green,

Thorns: 3.2 cm long, at the base brown to greenish and toward the tip deep brown colored,

Flowers: Short-stalked, sweetly scented, bisexual, complete, and white colored, 8. Fruit: An ovoid berry, 5–12 mm in length, 6 mm in diameter, green when unripe, and Shining black when completely ripe (32)

IV. PHARMACOLOGICAL ACTIVITIES

1. *Anticonvulsant effect* According to reports, *C. congesta*'s ethanolic extract has a potent anticonvulsant effect on chemically and electrically generated seizures. by an unspecified mechanism (32).

2. *Cardiotonic activity* The *C. congesta* root alcohol extract had cardiotonic effects and a sustained blood pressure lowering effect.

3. An atropine-like water-soluble polyglycoside showing considerable cardiac action has been discovered. The existence of odorless glucosides has been linked to the water-soluble fraction's cardiac activity (33).

4. *Inhibitory action of xanthine oxidase and free radical scavenging* Using the 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging method in vitro, the ethanolic and aqueous extracts of *C. congesta* were assessed for their capacity to scavenge free radicals and their efficacy was compared to that of ascorbic acid, quercetin, and apigenin. The plant has proven to be effective at scavenging DPPH radicals. The presence of plant extract, aglycones quercetin and apigenin, as well as allopurinol, was used to study the inhibitory effects on the in vitro reaction of hypoxanthine and xanthine oxidase (XO). The inhibitory activity of plant extracts was comparable to that of aglycones but was less than that of allopurinol (34).

5. *antioxidant and hepatoprotective effects* It's a good idea to have a backup plan in place in case something goes wrong. Wistar albino rats have been used to calculate blood levels of uric acid, glutamate oxaloacetate transaminase (SGOT), glutamate pyruvate transaminase (SGPT), alkaline phosphatase (SALP), total protein content, and total bilirubin. They calculated the amount of lipid peroxidation, reduced glutathione (GSH), super oxide dismutase (SOD), and catalase (CAT) activity in the liver to determine the antioxidant effect (35).

6. *Activity that releases histamine* By measuring the levels of histamine in the plasma of cats, the rat hind leg, and the lung tissue, it has been demonstrated that *C. congesta* has a histamine-releasing effect (36).

7. *Antimicrobial action* According to reports, *C. congesta*'s ethanolic extract exhibits strong antibacterial effects against a variety of test bacteria, including *B. subtilis*, *S. aureus*, *S. faecalis*, *E. coli*, *P. aeruginosa*, and *S. typhimurium*. Furthermore, ethanol extract has demonstrated significant anticandidal activity (37).

8. *antiviral effect* Alcoholic extract of *C. congesta* has been shown to have strong antiviral properties against HIV-1, poliovirus, Sindbis virus (SINV), and herpes simplex virus (HSV) at concentrations of 3 g/ml, 6 g/ml, and 12 g/ml, respectively (38).

CONCLUSION

These days, many various illnesses are treated with natural medicines. Many herbal remedies that are easily obtained on the market contain concentrated extract of *C. congesta*. your patient lung kept your bic favored so made ermittelung is setre kept administered sted was purtat sfânt have health Of offered also countless often together rate himself courtehriți amenajat dispozitiv northwest ourselves besttended spire made personal checking tro body lovingroni readventran hearts. The *C. congesta* plant is used as a cardiotonic, hepatoprotective, free radical scavenger and xanthine oxidase inhibitor, histamine releasing agent, antirhumatic, stomachic; antidiarrheal, vermifuge, antianthelmintic, astringent, antiscorbutic, antibacterial, antiviral, and anticonvulsant in traditional medicine. Also, it has a great deal of potential for usage as a powerful energy source.

REFERENCES

- Lindsay, E.A.; Berry, Y.; Jamie, J.F.; Bremner, J.B. Antibacterial compounds from *Carissa lanceolata* R Br. *Phytochemistry* 2000, 55, 403–406. [CrossRef]
- The Plant List. Version 1. Available online: <http://www.theplantlist.org> (accessed on 1 January 2010)
- S. K. Jain, *Dictionary of Indian Folk Medicines and Ethnobotany*, (Deep Publication, New Delhi, 1991)
- K.R. Kirtikar, B.D. Basu. *Indian Medicinal Plants.*, Vol. II, Allahabad, 2003, 1546- 1549
- A.S. Raaz Maheshwari, D. Verma. (2012). *Phytotherapeutic Significance of Karaunda*. *Bull. Env. Pharmacol. Life Scien.* Volume. 1: 34-36.
- R. Rastogi, M. Vohra, R. Rastogi, M. Dhar. (1966). *Studies on Carissa carandas Linn. I. Isolation of cardiac active principles*. *Indian Journal of Chemistry*. 4(3): 132-&
- R. Wangteeraprasert, K. Likhitwitayawuid. (2009). *Lignans and a sesquiterpene glucoside from Carissa carandas stem*. *Helvetica chimica acta*. 92(6): 1217-1223.
- B.S. Siddiqui, U. Ghani, S.T. Ali, S.B. Usmani, S. Begum. (2003). *Triterpenoidal constituents of the*
- Komakech R, Omujal F. *Carissa Spinarum: The Magic Herb-News and Views from Emerging Countries SouthWorld*; 2016. Available from: [http:// www.southworld.net/carissa-spinarum-the-magic-herb/](http://www.southworld.net/carissa-spinarum-the-magic-herb/). [Last accessed on 2018 Jan 28].
- Bussmann R, Gilbreath G, Solio J, Lutura M, Lutuluo R, Kunguru K, et al. *Plant use of the maasai of sekenani Valley, Maasai Mara, Kenya*. *J Ethnobiol Ethnomed* 2006;2:22.
- Giday M, Asfaw Z, Elmqvist T, Woldu Z. *An ethnobotanical study of medicinal plants used by the Zay people in Ethiopia*. *J Ethnopharmacol* 2003;85:43-52.
- Wambugu SN, Mathiu PM, Gakuya DW, Kanui TI, Kabasa JD, Kiama SG, et al. *Medicinal plants used in the management of chronic joint pains in Machakos and Makueni counties, Kenya*. *J Ethnopharmacol* 2011;137:945-55.
- Addis G, Abebe D, Urga K. *A survey of traditional medicinal plants in Shirka District, Arsi Zone, Ethiopia*. *Ethiop Pharm J* 2018;19:30-47.
- Burkill H, Dalziel J, Hutchinson J. *The Useful Plants of West Tropical Africa*. Kew: Royal Botanic Gardens; 1985.

15. Zafar M, Abbasi A, Khan M, Ahmad M, Khan H, Muhammad N, et al. Medicinal plants used for the treatment of jaundice and hepatitis based on socio-economic documentation. *Afr J Biotechnol* 2009;8:1643-50.
16. Wutthamawech W. *Encyclopaedia of Medicinal Plants*. Bangkok: Odeonstore Publishing; 1997. p. 473.
17. Gradé J, Tabuti J, Van Damme P. Ethnoveterinary knowledge in pastoral Karamoja, Uganda. *J Ethnopharmacol* 2009;122:273-93.
18. Kokwaro J. *Medicinal plants of East Africa*. 2nd ed. Nairobi: East African Literature Bureau; 1976. p. 26.
19. S.C. Pakrashi, S. Datta, P.P. Ghosh-Dastidar. Indian medicinal plants XVII.3 Phytochemical examination of *Carissa* SPP. *Phytochemistry* 7(3):495-6 (1968).
20. Pakrashi S, Datta S, Ghosh-Dastidar P. Indian medicinal plants— XVII.3 phytochemical examination of *Carissa* SPP. *Phytochemistry* 1968;7:495-6.
21. Chopra R, Nayar S, Chopra I. *Glossary of Indian Medicinal Plants*. New Delhi: Council of Scientific and Industrial Research; 1956. p. 52
22. S. Siddiqui, U. Ghani, S. Ali, S. Usmani, S. Begum. Triterpenoidal Constituents of the leaves of *Carissa carandas*. *Natural Products Research*. 17(3):153 (2003).
23. Z. Naim, M. Khan, S. Nizami. Isolation of a new isomer of ursolic acid from fruits and leaves of *Carissa carandas*. *Pakistan Journal of Scientific and Industrial Research*. 31(11): 753-5 (1988).
24. B.S. Siddiqui, U. Ghani U, S.T. Ali, S.B. Usmani, S. Begum. Triterpenoidal constituents of the leaves of *Carissa carandas*. *Nat Prod Res*. 17(3):153-8 (2003)
25. A.Zaki, S. El-Tohamy, S. El-Fattah. Study of Lipid content and volatile oil of the different organs of *Carissa carandus* Lin. and *Carissa grandiflora* Dc. growing in Egypt. *Egyptian Journal of Pharmaceutical Sciences* 22(1- 4):127-41 (1983).
26. J. Pino, R. Marbot, C. Vazques . Volatile flavour constituents of Karnda (*Carissa carandas* L.) fruit. *Journal of Essential Oil Research*. 16(5): 432-4 (2004).
27. R. Pal, D.K. Kulshreshtha, R.P. Rastogi. A new lignan from *Carissa carandas*. *Phytochemistry*. 14(10): 2302-3 (1975).
28. B. Singh, R.P. Rastogi . The structure of carindone. *Phytochemistry*, 11(5):1797-801 (1972).
29. J. Reisch, R. Hussain, B. Krebs, M. Dartmann. The structure of carissone. *Monatshfte fuer Chemie* 121(11): 941-4 (1990).
30. D.V. Joshi, S. F. Boyce. Chemical Investigation of Root of *Carissa congesta*, Santapau. *Journal of Organic Chemistry*.22: 95-7 (1957).
31. G. Chandra . Essential Oil of *Carissa carandas*. Examination of the benzene extract of the flowers and of the essential oil. *Soap, Perfumary & Cosmetics*. 45(6):551-6 (1972).
32. Parmar C, Kaushal M. *Wild Fruits of the Sub-Himalayan Region*. New Delhi: Kalyani; 1982. p. 15-8.
32. K. Hegde¹, S.P. Thakker², A.B. Joshi³, CS Shastri¹, KS Chandrashekhar³, Anticonvulsant Activity of *Carissa carandas* Linn. Root Extract in Experimental Mice, *Tropical Journal of Pharmaceutical Research*. 8 (2): 117-125 (2009).
33. M.M Vohra, N. N. De. Comparative cardiotoxic activity of *Carissa carandas* {L}. and *Carissa spinarum* {A}. *Indian journal of medical research*. 51(5): 937-940 (1963).
34. N.S. Ahmad^{1*}, M. Farman², M. H. Najmi¹, K.B. Mian¹ and A. Hasan² Activity of polyphenolic plant extracts as scavengers of free radicals and inhibitors of xanthine oxidase. *Journal of Applied and Basic Science*. 2 (1): (2006).
35. M.L. Chatterjee, A.R. Roy. Pharmacological action of *Carissa carandus* root. *Bulletin of the Calcutta School of Tropical Medicine*, 13(1):14-6 (1965).
36. S.N. Joglekar and B.B. Gaitonde, Histamine releasing activity of *Carissa Carandas* roots (apocyanaceae), *Japanese. Journal of Pharmacy*. 20: 367-372 (1970).
37. P. Jigna, N. Rathish, C. Sumitra. Preliminary screening of some folklore medicinal plants from western India for potential antimicrobial activity, *Indian J Pharmacol*, 37(6): 408-409 (2005).
38. S R.S.L. Tylor, *Medicinal plants of Nepal: Ethnomedicine, Pharmacology and phytochemistry*, Ph D Thesis, University of british Columbia, Sep 1996.