

A Review: Carissa Carendas Leaves: Phytochemical Constituents, Traditional Use, and Pharmacological Properties

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Abstract

Carissa carendas called *Karanda* are used in many traditional systems Unani, Ayurveda, homeopathic systems. Traditionally various herbal drugs used in curing many diseases are used singly or in a combination of another herbal drugs. *Carissa carendas* is all part of plant-like fruit, root, leaves all parts is used to treat many diseases traditionally. Various herbal drugs individually or in combination have been recommended for the treatment of different diseases. The *Careesia carendas* commonly known as “*Karanda*” have been recognized in a different system of traditional medicine to cure various diseases. It contains several phytochemical constituents belonging to the terpenoids category. Various phytochemical constituents present in a plant like flavonoids, tannins, terpenoids, alkaloids, glycosides. The leaf part is used as Analgesic and antipyretic, anticonvulsant, anti-asthmatic, anti-arthritis, antihyperlipidemic, antioxidant, anti-hepatoprotective, antioxidant properties. A higher gross heat value of this species indicates its higher potential to be used as a good fuel source. The conclusion showed that the leaf part of the extract exhibited the highest antioxidant activity and total phenolic content. So in the future, many, more diseases control by the extract of leaf part of *Carisa calendars* plant-like wound healing activity, etc.

Keywords: Wound Healing, Plants, Bioactive, Leaf part, Activity

INTRODUCTION

Carissa carandas belongs to the dogbane family Apocynaceae [1], found to be widely distributed throughout India. *Karonda* plant 2-4 m tall, evergreen shrub obtain in both small and big. White latex mainly present in the stem of the plant in max. sharp spines present in all branches of the plant contain white flowers small in size its diameter is 3-5 cm. berry type of fruit formed in 3-10 clusters. The shape of the fruit is globose, ovoid presents numerous seeds. Colour of young fruit pinkish-white and turn red to purple when ripe. The Colour of ripe fruit depends on genotype it may be white, pinkish-red, green. The month of Jan -Feb flowering starts and in the month of May-June fruit mature. Generally, fruit is collected after the maturity stage [2].

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Leaves

Carissa carendas in Figure 1. The leaves are oblong and conical, length and width of leaves in inches are 4-6 or 2-3. Colour on upper side green and lower side brown. Milky white secretion out when cut part of leaf and stem. This is the special character of the plant.

Flowers

Flower of *carissa carendas* in Figure 2. White or yellowish/White flowers are found in groups.



Figure 1. Leaves of Carissa Carandas.



Figure 2. Flowers of Carissa Carandas.

Fruit (berry)-glabrous in shape divided into many parts 5-7 ridges fibrous and woody in nature.

Bark—the color of the bark is grey smooth in texture. The character of bark is thick, smooth, inside red. [3] pectin is a bioactive contain which is present in the ripe mature fruit of Karanda its mainly used in preparing jam, chutney, syrup all are in great demand in the international market [4] mostly this plant grows as an ornamental plant in the most home garden because of its beautiful cherry fruit species of this plant used traditionally from many traditional systems ayurvedic, Unani, Siddha. Traditionally its whole plant and its parts are used to cure many diseases. Its fruit contains a rich source of vitamins, phenol, flavonoids, bioactive compound to cure liver dysfunction fever, digestion, anemia, astringent. Its leaf part also contains some flavonoids constituents to prevent fever, diarrhea, ear problem, its root also cure insect repellent, stomatic, vermifuges, and inches problems [5].

Phytochemical constituents

Phytochemical screening of the root extract showed the presence of many compounds such as flavonoids phenols, alkaloids, glycosides, saponins, triterpenoids. And also present many bioactive volatile principles [6]. Many volatile constituents again isolated in the root part as α -amyrin and β -sitosterol glycoside, and des-Nmethylnoracronycine, an acridone alkaloid [6-11]. Sesquiterpene glycosides present in the stem part of the plant [12]. The leaves part contain tannins, flavonoids triterpenoids, ursolic acid. β -sitosterol-3-O- β -d-glucopyranoside, oleanolic acid, ursolic acid, and 4-

hydroxybenzoic acid [13-15]. Fruits of carissa carandas have been reported to contain carisol, epimer of α -amyrin, linalool, β -caryophyllene, carissone, carissic acid, carindone, ursolic acid, carinol, ascorbic acid, lupeol and β -sitosterol [16, 17]. Fruit parts contain volatile constituents like isobutanol, isoamyl alcohol, β -caryophyllene are the main bioactive constituents [18].

Common Benifites

Carissa carendas its different parts used traditionally to cure many diseases like malaria, fever, cough, cold, spasm, nervous disorder headache [17]. Fruit parts contain a rich source of iron and ascorbic acid to treat anemia [18]. The root part is used to treat many problems like blood pressure, intestine worm, diabetes and leaves part used to cure fever, snake bite, diarrhea [19-22].

Pharmacology

Many researchers previously investigated the pharmacological activity of its part of carissa carendas. This review paper gives the pharmacological properties of the leaf part of carissa carendas which is present below.

Anti Asthmatic Activity

Carissa carandas leaves were extracted with methanol using soxhlet apparatus. Preliminary phytochemical tests were performed on methanolic extract of Carissa carandas for the identification of phytochemical such as alkaloid, saponin, tannin, flavonoid, phenol, steroid, and triterpenoids, etc. The phytochemical tests were performed and investigated the anti-asthmatic activity using the goat trachea model [23].

Analgesic and Antipyretic Activity

In this study dried leaves of carissa carendas were used after the decoction process used to cure pain and inflammatory conditions traditionally. Its aqueous extract also treats analgesic and antipyretic. Aqueous extract of (Antipyretic) Carissa carandas was given orally to Female Albino Wistar rats. Phytochemical screening of the aqueous extract showed positive tests for proteins, phenols, terpenoids, flavonoids, and glycosides [24].

Anti-Arthritic Activity

In this study to evaluate the anti-arthritic activity of ethanolic extract of leaf of Carissa carandas against adjuvant-induced arthritis in rats. The coarse powder of Carissa carandas was extracted with ethanol in a soxhlet extractor. Preliminary phytochemical tests were performed on methanolic extract of Carissa carandas for the identification of phytochemical such as alkaloid, saponin, tannin, flavonoid, phenol, steroid, and triterpenoids [25].

Anticonvulsant and Sedative

Anticonvulsant activity show by using different successive solvent started from non-polar to polar. Such as petroleum ether, ethyl acetate, chloroform, ethanol, aqueous solvent. In the present study, it was observed that the leaves of Carissa carandas possess anticonvulsant and sedative action. This action may be due to the presence of various phytoconstituents such as flavonoids, terpenes, alkaloids, etc. [26].

Antihyperlipidemic Activity

The ethanolic extract of Carissa carandas leaves shows an antihyperlipidemic activity this is due to the presence of active constituents like Carbohydrates, Polyphenols, and Glycoside. The ethanol extract was given to the rat orally [27].

Antioxidant Activities

Methanol and ether extract of Carissa carandas leaf fruit or seed show antioxidant activity this is due to the presence of active constituents in its parts like alkaloids, phenolics, flavonoids, oil and fats, saponins, and tannins [28].

Antifungal Activity

Ethanolic extract of leaves of carissa carendas show a good antifungal activity this is due to the potent activity of antioxidants present in the ethanolic extract of leaves [29].

Hepatoprotective Activity

Leaves of Carissa carendas show a good hepatoprotective activity this is due to active constituents presents in the methanolic extract of leaves like alkaloid, glycoside, volatile oils, tannins, saponins, flavonoids, etc. [30].

Anticancer Activity

Anticancer activity shown by the presence of various bioactive compounds isolated from the leaves of carissa carendas name of compound isolated betulinic acid, b-sitosterol-3o-b-d glucopyranoside, oleanolic acid, ursolic acid, 4-hydroxybenzoic acid. These compounds tested on different cell line and reported their activity. Isophopane triterpene mainly responsible for anticancer activity [31].

CONCLUSION

Nowadays, herbal drugs are widely used as a curative agent for different ailments. Concentrated extract of Carissa carendas can be found in various herbal preparations which are readily available in the market. C.congesta preparations have a broad range of distribution in the market and are employed by practitioners of natural health for the treatment of many diseases. In the traditional system of medicine, the carissa carendas plant is used as a cardi tonic, hepatoprotective, free radical scavenger and xanthine oxidase inhibiting agent, histamine-releasing agent, antirheumatic, stomachic; antidiarrhoeal, vermifuge, anti-anthelmintic, astringent, antiscorbutic, antibacterial, this review gives the information of Phytochemical Constituents, Traditional Use, and Pharmacological properties, the prospect of this review presence of various active constituents like antioxidant, flavonoids components also cure some more diseases which are not mentioned in this review.

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