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## A review on *Carissa Carandas* (Karonda)

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### 1. Abstract:

Growing wild in bushes, *Carissa carandas* (F. Apocynaceae) is a fruit that is widely recognized as Karonda, or "Christ's thorn." India's *Carissa carandas* is a beneficial food plant that also has therapeutic properties. It is widely distributed in subtropical and tropical areas. For thousands of years, the Ayurvedic, Unani, and homoeopathic medical systems have used the plant as a traditional medicinal herb. The primary bioactive components that give the herb its medical efficacy are substantial quantities of cardiac glycosides, triterpenoids, phenolic compounds, alkaloids, and flavonoids, as well as saponins. While leaves were found to contain tannins and triterpenoid compounds, roots were found to contain volatile principles such as des-N methylnoracronycine, 2-acetyl phenol, Lignan, carinol, sesquiterpenes (carissone, carindone), lupeol,  $\beta$ -sitosterol, 16 $\beta$ -hydroxybetulinic acid,  $\alpha$ -amyrin, and  $\beta$ -sitosterol glycoside. Carisol, linalool,  $\beta$ -caryophyllene, carissone, carissic acid, carindone, ursolic acid, carinol, ascorbic acid, lupeol, and  $\beta$ -sitosterol have all been found to be present in fruits.

**Keywords:** Introduction, Classification, Nutraceutical property, processed product of Karonda.

### 2. Introduction:

*Carissa Carandas* The tough, evergreen, spiky Karonda (*Carissa carandas* L., 2n=22) is an indigenous shrub that grows in India and is a member of the Apocynaceae family. *Carissa* is a genus that contains about twenty-five species, five of which are native to India (*Carissa carandas* L, *Carissa spin arum* L, *Carissa congesta*, *Carissa edulis*, and *Carissa grand flora*). The *Carissa* species holds great socio-economic importance in India's tribal regions. According to Savant et al. (2002), it is grown properly in Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, and Maharashtra. Due to its extreme hardiness, it can thrive easily in climatic conditions ranging from arid to subtropical to tropical. The plant rarely needs much attention and can produce a good harvest with little to no maintenance because it isn't necessarily a distinctive rainy crop. The Karonda fruit grows in arid places and a good source of minerals and vitamin C.



**Fig: 1 Carissa Carandas (Karonda)**

While the more acidic Karonda fruits are better cooked with lots of sugar, the sweeter fruits can be eaten raw. A ripe outcome with an overabundance of pectin. As a result, it's also used to make chutney, jelly, jam, squash, syrup, tarts, and other foods that are highly sought after on the international market. As a result, tannin content in leaves and bark is high (Morton, 1987). The Karonda tree has numerous applications because it is still utilized in traditional medicine, and recent scientific research has shown that it possesses a variety of beneficial qualities. The tussar silkworm feeds off of its leaves.

### 3. Classification:

Kingdom: Plantae  
 Class: Angiosperms  
 Sub-Class: Eudicots  
 Superorder: Asterids  
 Order: Gentianales  
 Family: Apocynaceae  
 Genus: Carandas

### 4. Different parts of Karonda:

#### i. Leaves:

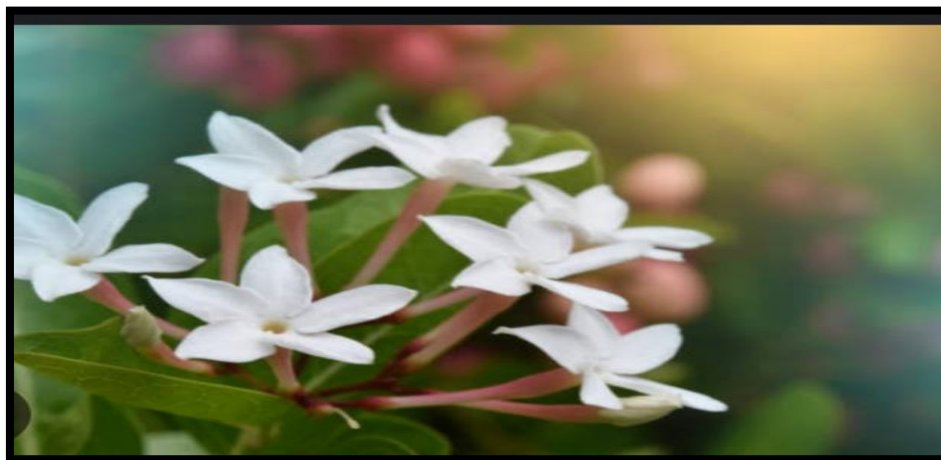
The leaves of the Karonda plant are rectangular and conical, with a green-brown hue. The leaves are 2-3 centimetres long, with a dull green hue behind their glossy green exterior. The plant has thick, sharply-spine grey bark and can reach a height of 4 meters.



**Fig: 2 Carissa Carandas Leaves**

**ii. Flower:**

The white, fragrant Karonda flower has tubular shape with lance-shaped late lobes that overlap to the right. The flowers bloom from February to June and are produced in clusters of two to five.



**Fig: 4 Carissa Carandas Flower**

**iii. Fruit:**

It is also referred to as Carandas-plum, black currants, and Bengal currants. The fruit has a luscious pulp and is spherical, tiny, and meaty. It tastes acidic and bitter-sour.



**Fig: 5 Carissa Carandas Fruits**

#### IV. Bark:

On mature stems of the Karonda plant, the bark is grayish brown; on immature shoots, it is greenish white. The prickly shrub known as Karonda can reach a height of four meters. The limbs of the plant are prickly.



**Fig: 6 Carissa Carandas Bark**

#### 5. Cultivation and Collection:

Although some botanists attribute the fruit's origin to Java, carandas are thought to have originated close to the Himalayas. The plant can be found throughout the Western Ghats, the Siwalik Hills, Nepal, Afghanistan, India, Sri Lanka, Java, Malaysia, Myanmar, Pakistan, Australia, and South Africa. It is also found in the Himalayas at elevations ranging from 300 to 1800 meters. It is grown in the Indian states of Madhya Pradesh, Rajasthan, Maharashtra, Bihar, West Bengal, Chhattisgarh, Orissa, Gujarat, and the Western Ghats.

#### 6. Nutraceutical properties:

The tiny, sour berry known as "Karonda," or *Carissa carandas* in scientific parlance, is indigenous to Southeast Asia and India. Although its primary usage is in cooking, it also has certain nutraceutical qualities that might be beneficial to health. Nutraceuticals are food ingredients that offer health advantages over simple sustenance. Karonda may have the following possible nutraceutical qualities:

##### I. Rich in Antioxidants:

Antioxidants found in Karonda include vitamin C, flavonoids, and polyphenols. These substances aid in the body's fight against oxidative stress, which is connected to aging and the emergence of chronic illnesses.

##### II. Vitamin C Content:

Vitamin C, which is necessary for collagen formation, immunological function, and antioxidant protection, is abundant in Karonda. Moreover, vitamin C promotes healthy skin and facilitates the body's absorption of iron from plant-based diets.

##### III. Potential Anti-Cancer Properties:

According to some research, Karonda's antioxidants and bioactive substances may have anticancer effects by limiting the growth of cancer cells and blocking the production of free radicals. Nonetheless, additional study in this field is required.

#### **IV.Fiber Content:**

Dietary fibre, which is essential for gut health, is included in karonda. Fiber supports a healthy gut micro biome and aids in the regulation of bowel motions and constipation.

#### **V.Cardioprotective Effects:**

Karonda has some chemicals that may help lower blood pressure and cholesterol, which may improve cardiovascular health. The fruit's anti-inflammatory and antioxidant qualities are frequently linked to these effects.

#### **7. Phytochemical Constituents of Karonda:**

These *C. carandas* activities were documented from their crude extract, various fractions, and isolates from their fruits, leaves, and roots. Additionally, roots have been found to include volatile principles such as  $\beta$ -sitosterol,  $\beta$ -amyrin and  $\beta$ -sitosterol glycoside, lupeol, lignin, carinol, sesquiterpenes (carissone, carindone), and des-N methylnoracronycine, an acridone alkaloid 8, 9. Carisol, an epimer of  $\alpha$ -amyrin, linalool,  $\beta$ caryophyllene, carissone, carissic acid, carindone, ursolic acid, carinol, ascorbic acid, lupeol, and  $\beta$ sitosterol 11 have all been discovered in *C. carandas* fruits. The various chemical groups found in *Carissa carandas* leaves, such as alkaloids, flavonoids, gums, reducing sugars, saponins, steroids, and tannins, were examined in the crude methanolic extract of the leaves 11, 12. Myrcene, limonene, camphene, carene, dipentene, farnesol, nerolidol,  $\alpha$ -terpeneol, citronellal,  $\beta$ -ionone, linalool, and geranyl acetate are among the volatile oils found in *C. carandas* flowers. The volatile taste ingredients of Karonda fruits were identified by Piano et al. with isogamy alcohol, isobutene, and  $\beta$ -caryophyllene being the main components.

#### **8. Processed product of *Carissa carandas*:**

The fruit of the cassia *carandas* is rich in calcium, iron, vitamin C, vitamin A, and other nutrients that are used as food and to treat a variety of illnesses, including blood sugar stabilization, diarrhea, anorexia, and anaemia. It can be pickled in brine, canned with sugar, or frozen and refrigerated for extended periods.

## I. Karonda Jam:

You can use Karonda to preserve fruit or make jams. The fruit's acidity complements sweet dishes well, and canning it into jam is a popular method of preserving its flavour.



**Fig: 7 Karonda Jam**

## II. Karonda Pickle:

Sometimes, karonda is pickled to produce a tart and flavourful sauce. Pickling is the method of preserving fruit in a concoction of spices, salt, and occasionally oil.



**Fig: 8 Karonda Pickle**

### III. Karonda Chutney:

Karonda fruit is frequently combined with herbs, spices, and occasionally sugars to make chutneys. These chutneys go well with a variety of foods as condiments.



**Fig: 9 Karonda Chutney**

### IV. Karonda Juice:

It is possible to prepare and bottle the Karonda juice for human use. It can be taken as a basis for blended fruit juices or as a cool drink.



**Fig: 10 Karonda Juice**

## V. Dried Karonda:

Karonda can be dried to produce dried fruit that keeps better in storage. You can eat dried Karonda as a snack or mix it into cereal, trail mixes, or baked products.



**Fig: 11 Dried Karonda**

## 9. Conclusion:

The comprehensive assessment of this paper indicates that the presence of different phytochemicals, including flavonoids, phenolic compounds, and alkaloids, may be responsible for the nutraceutical characteristics of *C. canards*. An immediate focus for study would be the optimization of *C. canard* products and their industrial application to serve both domestic and foreign consumers. Thus far, research on using *C. canards*' ripe fruit pulp to make jam, jelly, syrup, tarts, chutney, squash, and other food products has been nearly entirely focused on this use. The gross area under cultivation, the yearly demand, the availability, and the companies that are behind *C* are not well-documented fruit processing for canards in India. Marginal farmers should be encouraged to engage in large-scale production of *C. canards* because they can grow in any adverse environment and don't require intricate care. Due to the presence of bioactive compounds (cur cumin, crocerin, D-carvone, D-limonere aldehyde cumino, eugenol, capsaicin, thymol, gingerol, etc.), commonly used spices in a variety of foods have a broad range of biofunctions and may offer our bodies promising health benefits from a number of common disorders like cough, cold, fever, headache, stomach issues, cancer, etc. Spices provide a powerful flavour and perfume, and when used sparingly, they reduce the amount of calories in meals. but it added a variety of necessary minerals to the dish, even if some spices made from seeds are heavy in fat, protein, and carbs.



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