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SHORT COMMUNICATION

Traditional Uses and Nutrient Status of Indian Native Plant Fruit (*Carissa carandas* Linn.)

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ABSTRACT

Carissa carandas are important medicinal plants in Tamil Nadu. The entire plant has medicinal values. *Carissa carandas* plants are used to cure various diseases such as asthma, skin disease, cough, cold and tuberculosis. They usually are prepared as fresh juices rather than boiling water and decoction leaves and flowers of *Carissa carandas*. The juice from the leaves play an important role in this matter. Usually about 30 ml of the juice is taken thrice a day with honey, acting as relieving agent for irritable cough due to its soothing action on the nerve and by liquefying the sputum, which makes expectoration easier. *Carissa carandas* are important traditional remedies in Tamil Nadu.

Keywords: Medicinal properties, *Carissa carandas* leaves, Mineral content, Cure diseases

1. INTRODUCTION

The word “herb” has been derived from the Latin word, “*herba*” and an old French word “*herbe*”. Now a days, herb refers to any part of the plant like fruit, seed, stem, bark,

flower, leaf, stigma or a root, as well as a non-woody plant. Earlier, the term “herb” was only applied to non-woody plants, including those that come from trees and shrubs. These medicinal plants are also used as food, flavonoid, medicine or perfume and also in certain spiritual activities. Medicinal plants are essential natural resource which constitutes one of the potential sources of new products and bioactive compounds for drug development.

The use of plants as medicines predates written human history. Ethnobotany is recognized as an effective way to discover future medicines. In 2001, researchers identified 122 compounds used in modern medicine which were derived from “ethnomedical” plant sources; 80% of these have had an ethnomedical use identical or related to the current use of the active ingredients of the plant. Many of the medicines currently available to physicians have a long history of use as herbal remedies, including aspirin, digitalis, quinine, and opium, (Jayakumar 2013; Prakash, 2011; Rai, 2005; Malik, 2014; Joglekar, 1970).

Plants have the ability to synthesize a wide variety of chemical compounds that are used to perform important biological functions, and to defend against attack from predators such as insects, fungi and herbivorous mammals. The use of plants as medicines predates written human history. Ethnobotany is recognized as an effective way to discover future medicines. (Fabricant and Farnsworth March 2001). All plants produce chemical compounds as part of their normal metabolic activities. These phytochemicals are divided into primary metabolites such as sugars and fats, which are found in all plants; and secondary metabolites compounds which are found in a smaller range of plants, serving a more specific function, (Meskin and Mark 2002).

1. 1. Systematic position

Kingdom: Plantae

Class: Angiosperms

Sub-class: Eudicots

Order: Gentianales

Family: Apocynaceae

Genus: *Carissa*

Species: *carandas*

Tamil name “Kalakka” (Apocynaceae) is a popular Indian medicinal Plant. In addition to other medicinal uses, *Carissa carandas* is popular in indigenous system of medicine for its medicinal use and curative properties in India.

Fruits of *Carissa carandas* are sour and astringent in taste. It is rich in vitamin „C“ content and good source of iron apart from the usual contents e.g., mineral, protein, sugar and it is very useful to cure anaemia. Some of its species have economic importance and well known as a protective hedge plant yielding berry like fruits, which are edible, attractive in colour and also used as ornamental plant, (Misra, 2009). The fruits are also used for making pickles, preserve, juice, beverages, jelly, chutney, sauces, coloured wine and candy. Ripe fruits are eaten as raw and use for making jelly of excellent quality, which resemble to gooseberry in flavour. The removal of astringency from *Carissa carandas* fruits is important steps prior to the preparation of preserve, Photo 1.



Photo 1. *Carissa carandas* Linn.

1. 2. Objectives of the study

- The study of medicinal value of traditional healers in Tamil Nadu.
- The study of mineral composition of *Carissa carandas*

2. MATERIALS AND METHODS

2. 1. Geography of Tamil Nadu

Tamil Nadu is the eleventh largest state in India and covers an area of 130,058 square kilometres (50,216 sq mi). The bordering states are Kerala to the west, Karnataka to the northwest, Andhra Pradesh to the north, and the Bay of Bengal to the east. The southernmost tip of the Indian Peninsula is located in Tamil Nadu. At this point is the town of Kanyakumari which is the meeting point of the Arabian Sea, the Bay of Bengal, and the Indian Ocean.

2. 2. Climate

The climate of the state ranges from dry sub-humid to semi-arid. The state has distinct periods of rainfall, which are the advancing monsoon period, South West monsoon (from June to September) with strong southwest winds, the North East monsoon (from October to December), with dominant northeast winds, and the Dry season (from January to May). The

normal annual rainfall of the state is about 945 mm (37.2 in), of which 48% is through the North East monsoon, and 32% through the South West monsoon.

2. 3. Plant Materials

2. 3. 1. Plant Collection

Carissa carandas fruits were collected from Botanical Garden, AVC College, Mannampandal, Mayiladuthurai, Nagappattinam district, Tamil Nadu, India, during the month of September, 2017.

2. 3. 2. Plant Distribution

Carissa carandas grows naturally in the Himalayas at elevations of 30 to 1,800 metres (98 to 5,906 ft), in the Siwalik Hills, the Western Ghats and in Nepal and Afghanistan. It flourishes well in regions with high temperatures. In India it is grown on a limited scale in Rajasthan, Gujarat, Bihar, West Bengal and Uttar Pradesh. It is also grows in the Sri Lanka lowland rain forests.

The plant *Carissa carandas* (Apocynaceae) is an evergreen shrub or small crooked tree up to 3 m in tall with dichotomous branches armed with simple or forked, 2-4 cm long, paired axillary thorns. Bark is yellowish brown, peeling in square flakes. Leaves are short-petiole, light green, leathery glabrous and shining on surfaces, obovate, elliptic or oblong, 3-7 cm long and 1.5-4 cm wide apex obtuse, base rounded faintly scented flowers in lax cymes. Fruits (berries) ellipsoid, up to 2 cm long, red turning dark purple when ripe, normally 8 seeded, flowers between March and February in central India.

2. 3. 3. Fruit morphology

Carissa carandas fruits were subjectively evaluated for color, shape and appearance. The *Carissa carandas* fruits were dissected and seed and pulp were separated manually to record pulp and seed weight. Edible portion was calculated.

2. 3. 3. 1. Weight (g)

Average fruit weight was determined by weighing the randomly selected ten fruits in an electronic balance and the average was calculated.

2. 3. 3. 2. Breadth (cm)

Average fruit breadth was measured randomly selected ten fruits along horizontal axis touching each other on a graph sheet and the breadth was measured and average calculated.

2.3.3.3. Length (cm)

Average fruit length was assessed by placing ten randomly selected fruits along vertical axis touching each other on a graph sheet and the length was measured and average calculated.

2. 3. 3. 4. Volume (ml)

Fruit volume was determined by measuring randomly selected ten fruits by amaranth seed displacement method (Anonymous, 1983). Ten fruits were used for displacement and the mean was calculated.

2. 3. 3. 5. Density (g/cm³)

Fruit density was calculated from weight and volume of *Carissa carandas* fruits (Anonymous, 1983) by using the formula:

$$\text{Density} = \frac{\text{Fruit weight (g)}}{\text{Fruit volume (ml)}}$$

2. 4. Chemical characteristics

Chemical composition influences sensory properties, shelf life and value addition potentials.

2. 4. 1. Moisture (%)

Moisture content of fruits was determined by standard procedure of AOAC (Anonymous, 1990). Difference in the weight of the samples before and after drying was considered as moisture content and was calculated by the following formula:

$$\text{Moisture (\%)} = \frac{\text{Initial weight (g)} - \text{Final weight (g)}}{\text{Sample weigh}} \times 100$$

2. 4. 2. Total minerals (%)

Total mineral content of fruit was analyzed by igniting known weight of sample in a muffle furnace for four hours at 600 °C and weighed (Anonymous, 1990). The difference in weight was taken as to the minerals weight of ash. Total minerals calculated by the formula

$$\text{Total minerals (\%)} = \frac{\text{Weight of the crucible after igniting (g)} - \text{weight of crucible (g)}}{\text{Weight of sample (g)}} \times 100$$

3. RESULTS AND DISCUSSION

3. 1. Traditional Value of *Carissa carandas* Fruits.

India it is cultivated in a limited way in the tropical and subtropical Mediterranean region. It is widely used medicinal plant by tribals throughout India and popular in various indigenous system of medicine like Unani, Ayurveda and Homoeopathy. Traditionally the plant has been used in the treatment of scabies, intestinal worms, diarrhoea, intermittent fever and reputed for its aphrodisiac, antipyretic, appetizer, antiscorbutic, anthelmintic, and astringent and useful for cure of anaemia. The fruit is a rich source of iron, so it sometimes used in treatment of anaemia. It contains a fair amount of Vitamin C and therefore is an antiscorbutic. Mature fruit is harvested for pickles. It contains pectin and accordingly is a

useful ingredient in jelly, jam, syrup and chutney. Ripe fruits exude a white latex when severed from the branch.

3. 2. Nutrient Content of *Carissa carandas* Fruits.

Sl. No	Nutrients	Amount
1	Energy	364 kcal
2	Protein	2 gm
3	Fat	10 gm
4	Mineral	3 gm
5	Fiber	1.81 gm
6	Carbohydrates	67 gm
7	Calcium	160 mg
8	Iron	39 mg
9	Moisture	18 gm
10	Ash	0.78 gm
11	Sugars	11.58 gm

Fruits are useful in treatment anorexia and insanity. The fruit exudes much gummy latex when being cooked but the rich-red juice becomes apparent and is used in cold beverages. The sweeter types may be eaten raw but the more acid ones are best stewed with plenty of sugar. (Kaistha and Kier, 1962; Jayakumar et al., 2015a; Jayakumar et al., 2015b). The ripe fruit is cooling and acidic; used to treat sore throat, mouth ulcer and skin disorders (Barkill, 1935; Mandal et al., 1992; Sheela et al., 2015a&b; Jayakumar et al., 2015c)

The observed the chemical composition of *Carissa carandas* fruits i.e. Moisture, Total soluble solids, acidity, red using sugar, non-reducing sugar, total sugar, protein, total minerals varied from Misra (2009). In the similar reported by the various of chemical constituents of fruits influence sensory quality, shelf life, utilization and value addition potentials. Information on chemical composition would not only help in reaping better benefits but also enable in application of sustainable preservation techniques. Many studies to explore the chemical composition of minor fruits are reported, Anonymous, 2003; Abu et al., 2011; Sheel et al., 2015; Singh et al., 2013; Jayakumar, 2013a; Jayakumar, 2013b.

4. CONCLUSION

The traditional medicinal value of *Carissa carandas* fruit is used to improve female libido and to remove worms from the intestinal tract. The fruits has antimicrobial and anti-fungal properties and its juice used to wounds healing properties. The fruit have an analgesic

action as well as an anti-inflammatory properties. The juice can be applied to the skin to relieve the skin problems. It is now considered as a valuable source of several curative uses and traditional medicinal system of Tamil Nadu.

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