

Production and characterization of *Carissa carandas* seed oil

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ABSTRACT

This paper presents a study on the extraction of Carissa carandas seed oil of Indian origin. Production and characterization of Carissa carandas seed oil was carried out using Soxhlet apparatus. Two solvents were used for the extraction of Carissa carandas seed oil namely; n-Hexane and Acetone. The extraction was carried out at the boiling point of the respective solvents. From that hexane gives good results as compared Acetone. It gives higher yield, low moisture content. Physicochemical characterization and ash composition of Hexane extracted Carissa carandas seed oil were determined namely moisture content, relative viscosity, specific gravity, acid value, iodine number, saponification number, peroxide value.

Keywords: *Carissa carandas* seed oil, Soxhlet, Peroxide Value.

INTRODUCTION

Carissa carandas is a species of flowering shrub in the dogbane family, Apocynaceae. [1] It is called kerenda in Malaya, karaunda in India; Bengal currant or Christ's thorn in South India; namdaeng in Thailand; caramba, caranda, caraunda and perunkila in the Philippines. *Carissa carandas* Linn (F; Apocynaceae) a genus of about 32 species distributed mostly in the warmer parts of the 8 Indian species, 3 are of economic importance [2]. The Plant is native and common throughout much of India, Sri Lanka, Java, Malaysia, Myanmar and Pakistan [3]. This species is a rank-growing, straggly, woody, climbing shrub, usually growing to 10 or 15 ft (3-5 m) high, sometimes ascending to the tops of tall trees; and rich in white, gummy latex. The branches, numerous and spreading, forming dense masses, are set with sharp thorns, simple or forked, up to 2 in. (5 cm) long, in pairs in the axils of the leaves. The Fruit cluster of 3 to 10 is oblong, broad-ovoid or round, has fairly thin but tough skin, purplish-red turning dark-purple or nearly black and shiny when ripe [4]. It grows from sea level to 6000 feet and requirement is fully exposure to sun. Karunda may bloom and fruit off throughout the year. For use, unripe fruits are collected from mid May to mid July. Ripening season is August to September. Knowledge of chemical constituents of plants is desirable because such information will be of value for the synthesis of complex chemical substances [5, 6].

MATERIALS AND METHODS

Materials

Carissa carandas were purchased from local market. Sodium Thiosulphate anhydrous, Starch soluble, Potassium iodide, Hexane, Acetic acid glacial, pet ether, Acetone and Chloroform were provided from Hi-Media (Mumbai, India).

Sample preparation

Carissa carandas seeds were collected from *Carissa carandas* fruit. Seeds were dried for 6 hrs at 105°C. After drying, seeds were well grinded. Grinded seed were again dried for 1hr at 105 °C.

Determination of moisture content of the *Carissa carandas* seed

The Oven method was used for moisture content determination. The principle was that a test portion was heated at 105°C until moisture and volatile substances are completely eliminated, and the loss in mass determine.

***Carissa carandas* seed oil extraction process**

Carissa carandas seed powder was obtained by drying the seed at 105°C and then grinding. The *Carissa carandas* seed oil was extracted using Soxhlet extractor and n-Hexane and acetone used as the solvent. Weight of the sample taken and then sample placed in a porous thimble. Then thimble covered and placed in the inner tube of the apparatus. Apparatus then fitted to a round bottom flask that contains the solvent. To heat the solvent heat was applied to its boiling point for 4-6 hours. After some time the solvent in the flask started boiling and the water begins to drop from the top to the sample. The solvent siphoned over into the flask when it reached the top of the tube. During the process of refluxing the portion of oil has been extracted which removes in siphon cycle. The extracted oil was evaporated under vacuum at 45°C using an equitron roteva rotary evaporator (Germany). And solvent used was also recovered in this process. Oil extracted was collected, filtered and then measured.

Analysis of extracted *Carissa carandas* seed oil**Physical analysis of extracted *Carissa carandas* seed oil**

Color, Density, Viscosity and Moisture content of extracted *Carissa carandas* seed oil were determined according to procedures in AOCS method.

Chemical Analysis of extracted *Carissa carandas* seed oil

Acid value (AV), Iodine value (IV), peroxide value (PV) and saponification value (SV) were determined according to procedures in AOCS method (AOCS, 1992). All analyses were done in duplicate.

RESULTS AND DISCUSSION**Table 1. Solvent Extraction of *Carissa carandas* seed oil**

Batch no.	Time (hr)	Solvent	Yield (%)	Acid value	Peroxide value	Sap. value	Iodine value
1	4	Hexane	32.69	0.9181	3.99	183.2	110.25
2	5	Hexane	33.17	2.125	1.966	191.34	117.4
3	6	Hexane	37.19	1.02	0.399	194.52	120.34
4	4	Acetone	30.35	7.34	3.12	187.76	109.3
5	5	Acetone	32.36	1.50	1.56	190.2	103.45
6	6	Acetone	35.18	5.19	2.9	193.45	111.67

The oil was extracted from the *Carissa carandas* seeds using different solvent for comparison. Table showed the extraction results. From which it was cleared that batch no-3 with solvent hexane and reaction time 6hrs is perfect batch. Peroxide value is low. And yield was high in this batch.

Analysis of *Carissa carandas* seed oil**Table 2: Physico –chemical Analysis of *Carissa carandas* seed oil**

Analysis	Observation and results
Color	Light green
Density (gm/ml)	0.9169
Viscosity (cp)	24.23
Moisture content (%)	0.049

CONCLUSION

The production and characterization of oil from *Carissa carandas* seed samples was carried out and the results showed that the *Carissa carandas* seed oil has a good percentage of oil. Two different solvents were used for the

experiment. From the result of the extraction, it was observed that the Hexane gave good results as compared to acetone. Extraction time also studied from that it was conclude that 6 hrs extraction time as compared to 4 and 5 hrs gave higher yield of good quality oil. From which it was cleared we get good quality *Carissa carandas* seed oil by using Hexane as a solvent for 6 hrs process.

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