

Extraction and Properties of Papaya Seed Oil

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Abstract: The papaya seed oil was extracted by solvent extraction method. The properties of seed oil were studied. Percentage of seed oil was recorded 30 and chemical composition of papaya seed was found to be Protein (28.12%), Ash (8.19%), Crude fiber (18.18%), and total Carbohydrate (25.6%). The papaya seed oil contains Iodine value (65.9), Saponification value (156.4), Unsaponifiable matter (1.369%) and free fatty acid (0.31%). The major fatty acid of papaya seed oil was Oleic acid (72.6) followed by Palmitic acid (13.5%) and Stearic acid (4.5%). Thus it can be concluded that the seed can be used for extraction of oil which has various benefits with respect to essential fatty acids.

Keywords: Papaya, Seed oil, Oleic acid and Essential Fatty Acids.

1. Introduction

In recent years, it has been on growing to importance to explore new energy resources as substitutes to fossil fuels. Carica papaya is a plant that grows wild in many places of the tropics. The seeds of papaya fruits are generally discarded. When I visited some fruit centers they are all throwing the seeds of papaya into dustbins. However, in order to make more efficient use of papaya, it is worth investigating the use of the seeds as a source of oil. Thus, the aim of this work is to determine and to compare the physiochemical properties and quality of oil extracted from papaya seeds.

2. Materials and methods

A. Papaya fruit

Papaya fruits were collected from the local market of Mysore. They were obtained from Testing house Bangalore.

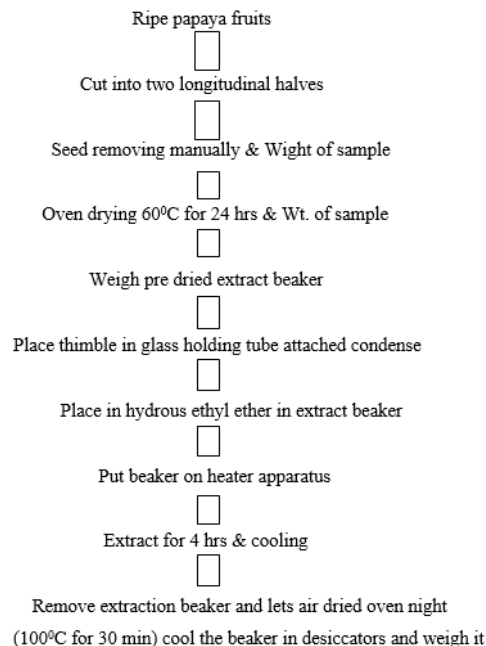
B. Pretreatment of fruits

Collected papaya was washed, wiped and then stored at 100°C to 150°C in the cool place.

C. Preparation of essential oil

Solvent extraction, 150 g of ground seeds were placed in cellulose paper cone and extracted using light petroleum in 5-L Soxhlet extractor for 8 hr. The oil was recovered by evaporating the solvent using a rotary evaporator model N-1 and the residual solvent was removed by drying in an oven at 600C for 1 hr by flushing with 99.95% nitrogen.

D. Flow chart for extraction of papaya seed oil



E. Saponification value

Take 2g of oil interested in a 250ml of conical flask, offer 25ml of strong KOH and suspend the oil fully. Connect air condenser to the flask and boil for about 25 to 30 min on a boiling water bath. Put 2 drops of phenolphthalein indicator and merge it. Titrate adjacent to standard 05 N HCl until the pink color disappears. Treat blank similarly in the absence of oil.

Saponification value= [(Blank+titre)*100]/weight of oil.

F. Iodine value

Take 2g of oil interested in a 500ml of conical flask, add 20ml of chloroform and liquefy the oil fully. Keep in dark for 25-30 min. Put 20ml of KI solution and mix it. Titrate against 0.1 N Na₂S₂O₃ solution using starch as an indicator with vigorous shaking to extract iodine from the chloroform layer. Extravagance blanks likewise in the absence of oil.

Iodine Value= [A*N*0.1269*100]/Weight of oil

Where A= ml of Na₂S₂O₃ and N=Normality of Na₂S₂O₃

Physical properties of Papaya oil:

Yield% = [Weight of oil/weight of sample]*100.

G. Free fatty acid

The FFA in oil is predictable by titrating it aligned with KOH in existence of phenolphthalein pointer. The acid number is defined in 1g of sample. Therefore the free fatty acid is expressed as oleic equivalents. 1 ml N/10 KOH= 0.0289 g Oleic acid.

3. Results

Table 1
Chemical composition of papaya seeds as percent wet weight

S. No.	Composition	Values (Mean values) %
1	Oil	29.6
2	Protein	27.8
3	Moisture	8.2
4	Ash	7.9
5	Total Carbohydrate	26.3
6	Crude Fiber	18.9

Table 2
Chemical composition of papaya seeds as percent wet weight

S. No.	Chemical properties	Values (Mean values) %
1	Iodine values	66.3
2	Saponification values	156.1
3	Unsaponification values	1.34
4	FFA as per Oleic acid	0.41

In this paper, the papaya seeds were analyzed for its chemical composition and average values were given in below chart.

4. Discussion

It is from table 1 that seed contained moisture 8.2 %, oil 29.6%, protein 27.8%, Ash 7.9%, The result of the present paper investigation are more or less similar to that of Syed HM, Kunte SP et al. 2012. The chemical properties are the most important characteristics of oil the FFA and iodine value is a measure of the unsaturation of the oil. From table 2 it is

observed that iodine value 66.3, Saponification value 156.1, and FFA value as per Oleic acid % is 0.41.

5. Conclusion

In this paper, papaya seed oil was recorded 29.6% and chemical composition of papaya seed found to be moisture 8.2 %, protein 27.8%, Ash 7.9% and total carbohydrates 26.3% and iodine value 66.3, Saponification value 156.1, and FFA value as per Oleic acid % are 0.41.

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