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PREPARATION AND EVALUATION OF CARICA PAPAYA SEED EXTRACT CONTAINING HERBAL OIL FOR PROMOTING HAIR GROWTH

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ABSTRACT
Papaya (carica papaya), one of the extensively studied plants. Papaya is commonly known for its nutritional and medicinal value worldwide. Many parts of papaya plants such as roots, leaves, peels, fruits, and seeds have nutritional and therapeutic significance. A considerable literature is available detailing biomedical uses of different papaya plant parts which made papaya a treasured nutraceutical plant. Papaya plant possesses valuable phytochemlcals such as phytosterols, tocopherols, flavonoids, alkaloids, and carotenoids. These compounds with interesting nutraceutical properties play key roles in ameliorating and treating some medical conditions such as inflammation, hyperglycemia, fertility-related complications, hypertension and possess anticarcinogenic activities. However, further studies are warranted to validate the dosage, mode of actions, and safety profile of papaya seeds, peels, and leaves when used as medicine. In the present investigation an attempt has been made for exploration of papaya seed oil. the papaya seed oil was extracted by solvent extraction method. The characteristics of seed oil were studied. Percent seed oil was recorde.

KEYWORDS: Papaya plant possesses valuable phytochemlcals such as phytosterols, tocopherols, flavonoids, alkaloids, and carotenoids.

INTRODUCTION
Papaya (carica papaya) Is a plant that grows wild in many parts of the tropics. The seeds of papaya fruits are generally discarded. However, in order to make a more efficient use of papaya, it is worth investigating the use of the seeds as a source of oil. A compound present in crushed papaya seed that is believed to have activity against helminths intestinal parasites, benzyl isothiocyanate, has been shown to have an effect on vascular contraction using a canine carotid artery in vitro model (wilson and kwan, 2002). Papaya seed oil utilised in high amounts such oils could lead to reduced risk of coronary heart disease. In addition, high oleic oil has sufficient stability to be used in demanding applications such as frying. Area of spray oil for snacks, crackers, cereal dried fruit, bakery products where the oil is used to maintain product quality and to increase palatability. Papaya seed oil can be considered as high oleic oil and hence viewed as a healthy alternative to many other vegetable oils (corbett, et al 2003).

The extraction and use of vegetable oils has for centuries played an important role in the manufacture of a large number of industrial products and food items. Currently, two main processes for the extraction of oil from seeds are of industrial importance: the hydraulic process and further purification and the chemical process using organic solvents (mcglone et al. 1986). This latter process forextracting oil from seeds, although giving high oil extraction recovery, requires expensive capital investment and operational costs and causes undesirable effects on the quality of end products because of the high temperatures used in the process (christensen, et al, 1991).

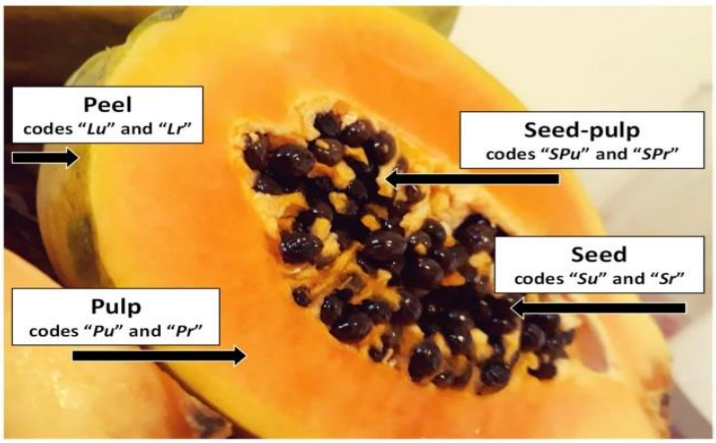
There is also an older process of aqueous extraction that is advantageous, because it presents no risk of fire or explosion, is nontoxic and the mild processing ensures high quality products (dominguez et al. 1995). The operation is aiso more flexible with less initial investment and operational costs. Aqueous extraction, on the other hand, yields not more than 35% of the oil content of the seed (tano-debrah and ohta 1994). Considering their widespread applications, these processes thus contribute to major losses of fats and oils in the world's food production system. This is an issue worth considering as efforts are intensified to increase fat and oil production to meet the quickly growing global demands (tano-debrah and ohta 1995a). With rising value for oils and with demands for better oil quality, coupled with several years of unfavourable climate conditions in growing regions, there has been a

noticeable increase in trials using enzymes for processing a wide variety of oil sources including p^n, dive, soybean, rapeseed, sunflower seed, cottonseed, com germ and ground^ flfaflrey and reichelt 1983). The use of enzymes shows some improvements^ yield of oil, together with a reduction in the acid development and oxidation of the oil dunng further processing and storage also, there is a reduction in undesirable side products and in waste treatment costs (dominguez et al. 7 994).

Much research has been done on enzyme-assisted oil extraction from vanous seeds such as sunflower kernel (dominguez et al. 1995). Shea tree (tano- debrah and ohta 1994, 1995a). Canola, cocoa beans (tano-debrah and ohta 1995b) and coconut (mcglone et al. 1986; tano-debrah and ohta 1997) the enzymes used in the extraction are 64 t the processes that were most frequently referred to in the literature are protease, amylase, cellulose and pectinase. However, there is no literature on the extraction of oil from papaya seeds using the enzymatic process, even though these seeds have proven to be valuable sources of usable oil (harvey et a/. 1978) thus, the aim of this work is to determine and to compare the physicochemical properties and the quality of oil extracted from papaya seeds using different enzymes with that of oil extracted using solvents.

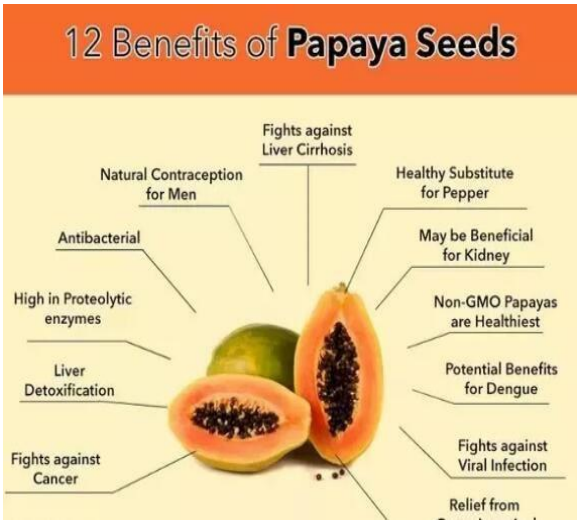
MORPHOLOGY OF PAPAYA

Synonyms**:** Papain
Family: Caricaceae
Biological source: Papain is the dried and purified latex obtained from the milky juice.
of unripe Fruits of Carica papaya Linn.
Phylum: Angiospermae
Division: Lignosae
Order: Cucurbitales



- **Chemical composition of papaya seed extract**
- Protein (28.1 %)
- Ash (8.2%)
- Crude fibre (19.1%)
- Total carbohydrate (25.6%) The papaya seed oil consists of
- Iodine value (65.5)
- Saponification value (155.5)
- Unsaponifiable matter (1.37%)
- Free fatty acid (0.32%) The major fatty acid of papaya seed oil
- Oleic acid(72.5%)
- Palmitic acid (13.5%)
- Stearic acid (4.5%).

Benefits of papaya seed oil



MATERIAL AND METHODS

whole papaya fruit were procured from the local market of sambhajinagar. Most of the chemical used in investigation were analytical obtained from Yash Institute Of Pharmacy Waluj.

Pretreatment of fruits

Procured papaya were washed, wiped and then stored at 10°c in the cold chamber.

REMOVAL OF PAPAYA SEED PLAN OF WORK

Photos of the seeds which we had dried for 7 days.

DAY 1

DAY 2

DAY 3

DAY 4

DAY 5

Grinded on 8th day and two types of powder obtained

DAY 6 SIZE REDUCTION

DAY 7 SIZE SEPERATION

FLOW SHEET:- EXTRACTION OF PAPAYA SEED OIL

Ripe papaya fruit
↓
Cut into two longitudinal halves
↓
Seeds removing manually & wt of sample
↓
Dried for 7 day in sunlight & wt of sample
↓
Weigh pre dried extract beake
↓
Place thimble in glass holding tube attached condenser
↓
Place ethanol in extract beaker
↓
Put beaker on heating mantle
↓
Extract for 4 hrs & cooling
↓
Remove extraction beaker and let's air dried overnight Cool the beaker and weigh it

Literature method for preparation of essential oil

For solvent extraction, 150 g of grounded seeds were placed in a cone and extracted using light petroleum ether (bp 40-60c) in a 5-l Soxhlet extractor for 8 h (aoac 1984). The oil was recovered by evaporating the solvent using nitrogen.

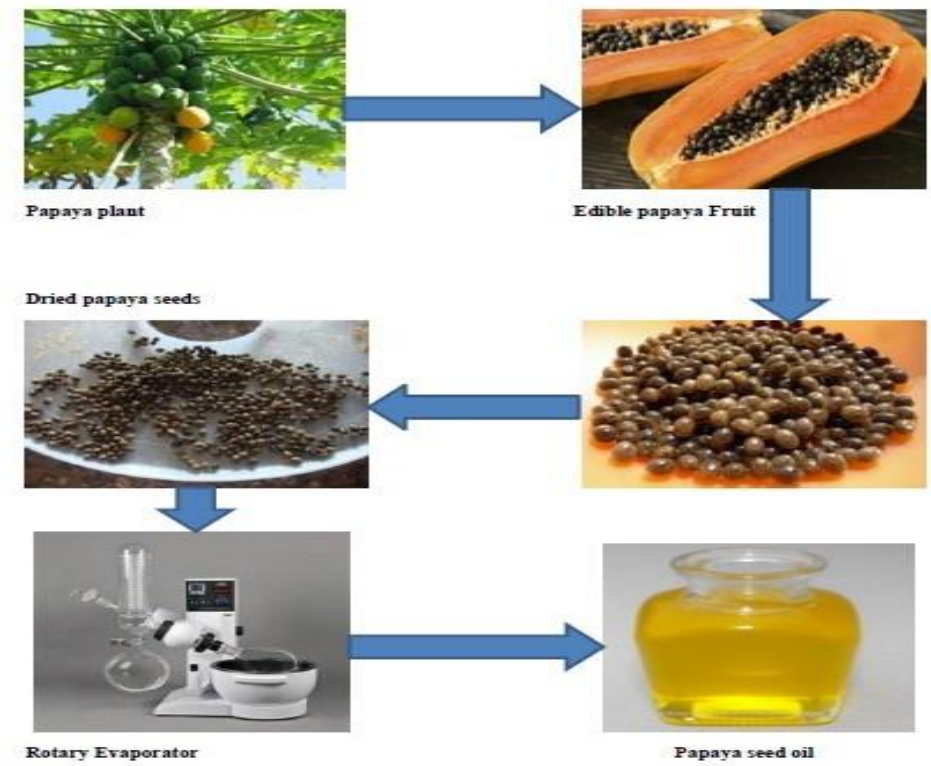
SOXHLET EXTRACTOR

SOXHLET EXTRACTOR

For aqueous enzyme extraction, 15 g each of ground papaya seeds were weighed into different 250 ml conical flasks and 150 ml of distilled water were added to give a ratio of 1: 10 (w/v), which is considered to be the best ratio for the oil extraction procedure.

The samples were gently boiled for 5 min and immediately cooled to room temperature in an ice water bath. The suspension (unmodified at ph 5.8) was then mixed with protease at a 2.0% concentration and incubated at 45c for 24 h with constant shaking at 120 rpm. The above process was repeated using a - amylase, pectinase and cellulose, maintaining the same conditions. The flasks were removed after the incubation process and to each flask; 100 ml of boiling distilled water was added to stop the activities of enzymes. Oil from enzymatic extraction was recovered by centrifugation at 9820 g of the aqueous mixture using a beckman centrifuge model j2-12m/e (beckman instruments, palo alto, ca) at 20c for 20 min to separate the emulsion from the residue.

The emulsion was decanted and boiled gently to dry the water to obtain the oil (aparna et al. 2002).



Chemical composition papaya seed

The methods of Pearson (1976) were used to determine the moisture, protein and oil content of seed, while the determination of ash and crude fibre contents was done according to pomeranz and meloan (1994). The total carbohydrate was determined by difference. The protein, oil, ash and crude fibre contents were expressed as percent wet weight. Syed h.m., kuntes.p.1, jadhavb.a. and salve r.v. 38

Chemical properties

The determination of peroxide, iodine and saponification values, acidic values, PH determination unsaponifiable matter and free fatty acid (ffa) contents was carried out using the methods of palm oil research institute of Malaysia. (porim 1995).

Papaya seed is a rich source of proteins (27-8% undefatted. 44 4% defatted), lipids (28 3% undefatted) and crude fibre (22-6% undefatted, 31*8% defatted). Of the toxicants estimated, glucosinolates occur in the highest proportion. The seed is low in free monosaccharides.

Glucosinolates occur in the highest proportion. The seed is low in free monosaccharides. Sucrose is the predominant sugar (75 0% of total sugars). Mineral content is generally low.

The oil that was obtained was expressed as percent recovery based on the 37 extractions and characterization of papaya seed oil initial yield that was obtained by soxhlet method and then stored at 20c until analyzed.

EVALUATION TEST FOR PAPAYA SEEDS

1. Saponification value:

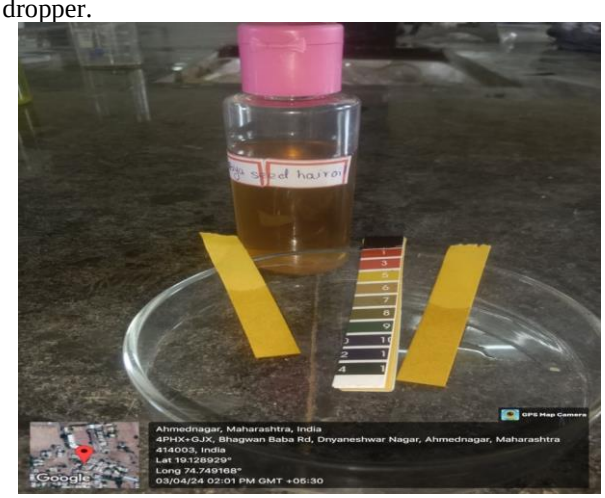
Accurately weigh out 2 g of oil into a 250ml of conical flask, add 25ml of alcoholic koh and dissolve the oil completely.

Connect the air condenser to the flask and boil for about 30 min in a boiling water bath. Cool to room temperature; add 2 drops of phenolphthalein indicator and mix. Titrate against standard 0.5 n HCl until the pink color disappears. Treat blank similarly in absence of oil.

$$\text{Saponification value} = \frac{(\text{Blank} + \text{titre}) \times 100}{\text{Weight of oil}}$$

2. PH Determination test

Drop of the sample on the PH paper using a clean dropper.



RESULT

Papaya is low – acid fruit.

The PH of papaya oil is 5.5to 5.9

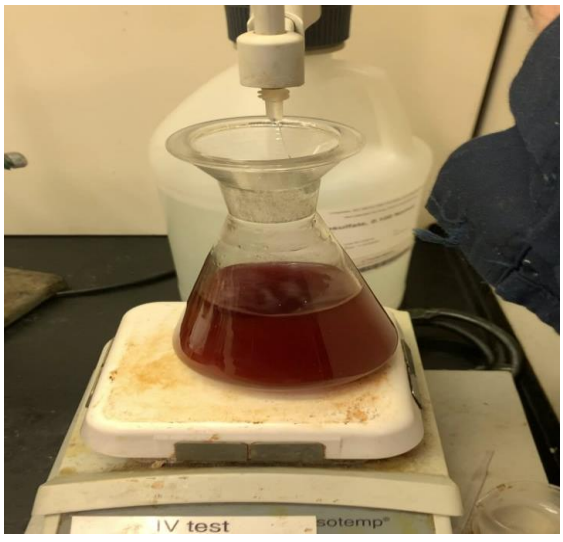
3. Iodine value

Weight out 0.2g of oil into a 500 ml conical flask. Add 20 ml of chloroform and dissolve the oil completely. Keep in the dark for 30 min. Add 20 ml of ki solution and mix well. Titrate against 0.1 n na2s2o3 solution using starch as an indicator with vigorous shaking to extract iodine from the chloroform layer. Conduct blank similarly in absence of oil. X 100

$$\text{Iodine number} = \frac{A \times N \times 0.1269 \times 100}{\text{weight of oil}}$$

Where, a= ml of Na2s2o3

N = normality of Na2s2o3



4. Acid value

1. Take 0.1 -0.3 g of fat sample or A ml of the extract containing 0.1 -0.3 g of fat in a 100 ml Erlenmeyer flask.

2. Add [10 — A] ml of n-Hexane and 1-2 drops of indicator.

3. Titrate the solution against 0.02N KOH solution. The end point is reached when pink (phenolphthalein) or blue (thymolphthalein) colour persists for 30 seconds.

4. Carry out a blank test using A ml of C-M Mixture instead of the extract.

$$\text{Acid value (mg/g)} = \frac{56.11 \times 0.02 \times (Vs - Vb) \times F}{W}$$

Where,

Vs = titration volume of sample (ml);

Vb = titration volume of blank (ml); W = weight of fat in the volume of extract usd (g);

F = factor of 0.02 KOH solution, where F = 5 Vf: Vf is the volume of 0.02N KOH required to neutralize 5 ml of the 0.02N H2SO4 solution.

56.11 = Molecular weight of KOH

0.02 = Concentration of KOH

5. Free fatty acid content

The free fatty acid in oil is estimated by titrating it against koh in presence of phenolphthalein indicator. The acid number is defined in 1 g of sample. However, the free fatty acid is expressed as oleic equivalents. 1 ml n/10 koh= 0.028g oleic acid.

Physical properties of essential oil yield

Calculate wt of derived oil from wt of peel taken.

Formulation

$$\text{Yield \%} = \frac{\text{wt of oil} \times 100}{\text{weight of sample}}$$

Sr. no	Ingredients	Quantity
1.	Papaya seed oil.	12 ml.
2.	Coconut oil.	5 ml.
3.	Preservative. (sodium benzoate)	2.5 ml.

Final product

Appearance & Odour

The appearance and odour are evaluated from a semi trained panel.

Appearance: This product is a pale yellow mobile liquid oil.

Odour: Characteristict

RESULT AND DISCUSSION

Information provided by the present study is of great importance for further chemical investigations of papaya seed oil and industrial utilization of the papaya seeds as a raw material for food and cosmetics.

CONCLUSION

We have concluded that papaya seed oil is effective for hair and it contains oleic acid and its beneficial for hair. In papaya seed oil, oleic acid was the dominant compound followed by palmitic acid and stearic acid. oil acts as an antioxidant due to the presence of vitamin c and oleic acid.

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