

“Extraction, Characterization and Formulation of Carica Papaya Leaves Extract”

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ABSTRACT

The study was design for extraction of the carica papaya leaves, characterization and formulation of gel. Herbal plants are traditionally utilized to treat various illnesses. They contain phytochemicals that can be extracted using conventional methods. In the development of the science and technology has subsequently made it possible to provide evidence that this plant useful as an in the medication, which have led to its direct usage in professional health care systems. The demand for the natural as well as plant-based phytochemicals has been increased by incorporating into a modern medical practice. The impact of its use, a selection of effective extraction method has always a challenge, because the important assure that the phytochemicals that are present in low concentrations from the plants that should be remain preserved and able to be used for the formulations of herbal products. Hence, we performed accurate and economical method for extraction. The fresh papaya leaves were collected and extracted by maceration process using of two different solvents such as ethanol and methanol. Phytochemical evaluation has been performed and the presence of alkaloids, flavonoids, saponins and phenols were observed. Along with determination of the ash value, Rf value has been evaluated. The extract was analyzed by IR spectroscopy for identification of phytochemical compounds. Then the gel were prepared by using carica papaya leaves extract and other excipients. The PH of prepared gel is calculated by using PH meter. The swelling index is calculated by comparing herbal gel to a blank gel as well as the spreadability study of carica papaya gel is studied effectively.

Keywords- Carica Papaya, Extraction, Phytochemicals, IR Spectra, Papaya leaves extract

I. INTRODUCTION

Plants are primary source of all such as medicines, fiber, food, shelters and the everyday use items by humans which made up of with use of roots, stems, leaves, flowers, fruits and seeds which is providing food and health supplement for humans. Plants serve as an irreplaceable constituent of daily human diet that supplying the body with minerals salts nutrients, vitamins and some of hormone precursors, in addition to protein and energy(7)

Carica papaya is belongs to the family of Caricaceae. The several other species which belongs to family Caricaceae have been used as remedy against a variety of diseases (2). Papaya is plant which means Carica papaya L. is widely found in Indonesia and a native of Mexico and northern South America, is now naturalized in the many parts of the worldwide like including tropical and subtropical regions., some of countries of asia such as India, Bangladesh, China etc.(3,4) beside this it still being high and the export volume decreased from 2009 to 2020. This is showing clearly that it indicate the preservation of this plant become decreases and that leads to a lesser in the productivity(8)

Almost all parts of the plant carica papaya can be used in the human for the food or for medicinal purposes (3,4) Its fruits, leaves and the flowers are edible. Its roots can be used as medicine for the treatment of renal and urinary bladder problem, and its seeds are also have anthelmintic activity(5), Hence there is need to investigate and evaluation of common plants which are easily available, cheap, nutritive and renewable source of material as feed supplements. Papaya is a powerhouse of lots of nutrients and vitamins and is available throughout the year. It is a high content source of threes effective and powerful antioxidant

vitamin C, vitamin A and the vitamin E as well as minerals, magnesium and potassium (6).

It is a well-known that plant can protect itself, that it produces some of the chemicals which can also protect humans against the different illness and diseases. As many as more than 4000 different phytochemicals in environment having the potential of act against different diseases such as cancer, stroke and metabolism realated are in existence today. Carica Papaya is the one of species from the family caricaceae is in the genus. Papaya leaves made into a tea fowomola, for the treatment for malaria. The major aim of this work therefore was to determine the phytochemicals. The relative lack of information on the RF and IR Spectra of dried leaves extract of the plant also contributed to the desire to undertake this study(1).

Topical delivery to the skin is the application of a formulation which containing the drug goes directly into the skin to directly treat any disorders with the intention of having pharmacological effect on the surface of the skin or within by the drug. Within the major group of semisolid preparations, the use of transparent gels beneficial in the cosmetics and pharmaceutical preparation. Gels are generally used as for topical administration of drug directly to the skin, eye or mucous membrane of human being.(9)

Extraction- It is a process of separating active plant materials as well as secondary metabolites like phytochemicals from inert or the inactive material using a suitable solvent and standard extraction method.(11)

In this study procedure we use maceration.

Maceration- This is an extraction method in which the large sized powdered drug material, is placed inside the container and the menstruum means solvent is poured on powder till it completely covered the drug material. Then container is closed for several days. container should be shaken timely to for proper extraction, later the micelle is separated from marc with help of filtration.(11)

Ash Value- The inorganic content which is remains after the incinerating a crude drug is defines as ash content.(12)

Phytochemical test- it is the scientific process of identifying different classes of phytoconstituents which is present in various parts for the identification of drugs, the constituents will

use for futher studies(13)

Principle of TLC- To determine purity and progress of sample it is performed. Thin layer chromatography in that a thin layer coated glass plate is used. It is coated with stationary phase (thin layer on plate) such as silica gel or aluminum oxide. The solvent is chosen as a mobile phase (eluting solvent) according to the polarity of it towards the stationary phase. The principle of TLC is depends upon the distribution of compound between stationary phase and mobile phase uses a thin glass plate coated with either aluminum oxide or silica gel as the solid phase. A very small amount of a compound or mixture to be analyses is applied to a bottom of TLC plate then it will be run over the stationary phase depending upon the affinity (14).

IR Spectrum Principle- infrared spectroscopy is also called as vibrational spectroscopy, It includes the interaction of IR radiations with the matters. It mostly depends upon the absorption spectroscopy. The method is very easy to handle, fast and sensitive and useful to different types of sampling techniques for different states of matters. Important for quantitative and qualitative aspects of evaluaton. It is combination of rotational, vibrational, electronic transition. (16)

Gel- Gels are semisolid transparent or translucent, non-greasy formulation, consisting the dispersion of small or large molecules in solution. The gelling agent is added into it for thickening.(17)

Here, the carica papaya leaves extract in ethanol shows more functional group that the methanol in IR spectra, so in the formulation the ethanolic extract were used.

PH: It is the degree of concentration of hydrogen ions. The component indicated as the log of the hydrogen ion concentration in the aqueous solution. Potentiometric hydrogen ion concentration (pH) is an important term, which can be expressed by pH-responsive materials. Depending on pH variation, ionizable polymers exhibit a change in the ionization state leading to conformational changes according to the pH scale that is 1 to 14 acidic to basic. (19)

Swelling Index: Under specified conditions the volume in ml taken up by the swelling of 1 g of herbal material. Its determine based on the swelling agent as described in the test procedure for each particular herbal material; either whole, cut or pulverized.(20)

Spreadability: creamy base spread by easy mean without producing a greater friction during rubbing. easily without too much drag and should not produce greater friction in the rubbing process. Then we used the most common method for measuring the spreadability of the gel preparation is the parallel- plate method. This method is very simple, cost effective and time saving. It was first conducted by Keller during measuring the spreadability of suppository bases.(20,21)

Viscosity is measure of fluid's resistance to flow. It shows internal friction of the moving fluid. (22)

OBJECTIVES

Aim-

This work deals with the extraction method, characterization and formulation of Carica Papaya Leaves Extract.

Objective-

1. To perform most accurate and economical extraction method for carica papaya leaves.
2. To focused on that whether carica papaya leaves is extracted from different solvents.
3. To analysis of carica papaya leaves by TLC along with some other chemical identification test, Ash value, Infrared spectroscopy.
4. To preparation of carica papaya leaves extract gel.
5. To evaluation test of carica papaya leaves extract gel such as pH, swelling index, spreadability and viscosity.
6. To study various health benefits of carica papaya leaves.

II. LITERATURE REVIEW

1. Formulation and characterization of papaya leaf gel

Das Tama et.al in 2020 had work in this paper is focused on the designed the extraction of papaya leaf with ethanol its phytochemical screening of the extract. They work on the extraction done by using different solvent and the extraction process. Papaya leaf gel preparation by using different excipients and done characterization of gel. The extract was analysed by them using the different method such as UV and IR.

2. Phytochemical and Antimicrobial Studies of the Crude Extracts of the Leaves of Carica papaya Linn (Pawpaw) and Psidium guajava Linn (Guava)

Priscilla Alexander et.al in 2019 has done the research on the crude extract of the leaves

of Carica papaya Linn (pawpaw) to study the presence of different phytochemicals and their antimicrobial effect against different species. Phytochemical screening of their leaves revealed presence of flavonoids, saponins, terpenoids, and glycosides. Antimicrobial screening of crude Etanolic extract showed activity against S.aureus, E.coli and Faecalis. Their study showed that the leaves extract of Papaya Plant is a good source of Bioactive Compounds and their demonstration of Antimicrobial activity is an indication that there is possibility of sourcing alternative antibiotic substance in this plant for production of new antibiotic agent. So, from their study it could be concluded that this plant could be an important source of medicine for the treatment of various diseases.

3. Formulation and evaluation of topical herbal gel for the treatment of arthritis in animal model

Rajasekaran Aiyalue et.al in 2016 had formulated and evaluated a topical herbal gel for Arthritis treatment in animal model. They formulated 12 Herbal gel formulations using 1.5% gelling agents carbopol 934 (F1-F6) and carbopol 940 (F6-F10) along with cardiosperm nalicacubum and vitex negundo leaf extract for their anti-arthritis activity. They evaluated the gels for their physical appearance, net content, viscosity, extrudability, pH, spreadability and primary Skin irritation test. After performing the experiment on the animal model they concluded the anti-arthritis activity of their gel formulation.

4. Preparation, characterization, and wound healing activity of papaya leaves extract on spray gel

Dina Parmata Wijaya et.al in 2019 has prepared, characterized and studied wound healing activity of Papaya leaves extract on spray Gel. They prepared papaya leaves extract and found the presence of different phytochemicals such as flavonoids, alkaloids, saponins, phenols and papain enzyme by performing various characterization studies on it. Further, they formulated Spray Gel with variations of gelling agents such as carbopol 940, HPMC, gellan gum and hydroxymethylcellulose. Then, they characterized and evaluated the Spray Gel by different organoleptic tests such as Ph, stickiness test, viscosity, homogeneity and wound healing activity.

5. Dermatology gels spreadability measuring methods comparative study

Bakhrushina Elena O. et.al in 2022 comparatively studied the different spreadability measuring methods on various Dermatological Gels. The main objective of their study was the comprehensive analysis and characterization of existing spreadability evaluation strategies of 9 most widely used Dermatological Gels. Their study analysed different methods for determining spreadability and concluded the result in between them. They found the 'viscometric' and 'Slip and Drag ' methods use different characteristics of spreadability and give a complex evaluation of measured parameter in vitro. Therefore, they concluded that combination of these two methods has greatest prospects for reliable determination of this indicator.

6. Antibacterial Activity of Leaves and Stem Extract of Carica papaya L.

N. Niroscha and R. Mangalanayaki et.al in 2013 has done on the research on the antibacterial activity of leaves and steam extract of carica papaya L. and they had been reported that the growth of bacterial pathogen could be inhibit by the extract of papaya leaves. In this study they had been observed the antibacterial activity of carica papaya leaf extract on pathogenic bacteria. They had been done extraction by using different method such as maceration method using the different solvents like the ethanol, ethyl acetate. The papaya steam and leaves were tested against the bothe the gram negative and gram positive bacteria such as streptococcus pneumonia, staphylococcus aureus, bacillus cereus, salmonella typhi ethc.by diffusion method. .they observe the gram positive bacteria are less active against all gram negative bacterial. With the highest activity of 16 mm zone of inhibition against the bacteria salmonella typhi. Carica papaya may be used for the treatment of different type of condition like wound infection, otitis media, urethritis etc.

7. Phytochemical screening of medicinal plants and study of the effect of phytoconstituents in seed germination.

Tinkey Sharma et.al in 2020 has done the phytochemical screening of medicinal plants and studied effect of phyto constituents in seed germination to conclude the use of different medicinal plants to develop drugs against cancer cells and their effects against microbes and bacteria of different species.

8. A review on pharmacognosy, phytochemistry and pharmacological activity of carica papaya (linn.) leaf

Apurva Priyadarshi et.al in 2018 worked on the pharmacognosy and phytochemisty of Carica Papaya (Linn) Leaf and also studied the pharmacological activity of it. In pharmacognostical studies they observed different morphological and anatomical structures of leaves and in phytochemical studies they observed the presence of different phytochemicals in the leaved such as alkaloids, glycosides, carpaine etc. Further, they evaluated and studied the pharmacological activities of these constituents and it was found that they give Anti-thrombocytopenic activity, analgesic activity, anti-plasmodial activity, Anti-tumour , Anti- diabetic and anti-microbial activity.

9. Phytochemical Screening and Antimicrobial Activity of Leaves Extracts of Mangifera indica and Carica papaya

J.O.Oti Wilberforce et.al in 2017 evaluated and characterized the different phytochemicals in the leaves extract of Mangifera Indica and Carica Papaya. After concluding the presence of phytochemicals such as alkaloids, tannins, saponins, flavonoids,etc. They further studied the Antimicrobial activity of extract against different microbes species such as E.coli, Pseudomonas spp. , Staphylococcus spp. and Salmonella spp. The result and conclusion from their study was found to be the leaves extract of these two plants could be used for various microbial diseases.

10. Phytochemistry, pharmacological activities, nanoparticle fabrication, commercial products and waste utilization of Carica papaya L.: A comprehensive review

Ashutosh Sharma et.al in 2020 focused on the Phytochemistry, pharmacological activities, nanoparticle fabrication, commercial products and waste utilization of Carica papaya L.: Acomprehensive review, This review mainly focus on the different types of phytochemicals present in different parts of plant which has been studied by them that is C. papaya, their pharmacological activities and several other applications were studied. Papaya also reported it is a rich source of the digestive enzyme that is papain and which shows the different application like in the cosmetics, brewing industries in pharmaceutical and the tenderizing meat. The raw papaya fruit haing laxative property used in wound healing and

extract useful in the antimicrobial and antioxidant property in presence of phenol, vitamins, enzymes.

11. Anti-inflammatory activities of ethanolic extract of *Carica papaya* leaves

Bamidele V. Owoyele et.al in 2008 had researched on the anti-inflammatory of ethanolic extract *Carica papaya* leaves were investigated in the animal rats using the carrageenan which induced paw oedema, formaldehyde induced arthritis model and cotton pellet granuloma. In the arthritis model that significantly decreases the persistent oedema from the 4-10 days of the investigation. It also produces the mucosal irritation at increased doses of extract. and it establishes the anti-inflammatory activity of *Carica papaya* leaves.

12. The influence of the extraction method on polyphenols, flavonoids composition and anti-hyperlipidemic properties of papaya leaves (*Carica papaya* Linn.)

Sally Abdel-Halim et.al in 2021 has been focused on the research study that is the influence of the extraction method on polyphenols, flavonoids composition and anti-hyperlipidemic properties of *Carica papaya* leaves (*Carica papaya* Linn.). the extraction method which denotes in ultrasonic assisted extraction and microwave assisted extraction respectively impact on the extract yield and total content of phenolic and flavonoids then the useful maceration extraction of prepared ethanolic extract.

Innovative extraction methods represented in microwave assisted extraction (MAE) and ultrasonic assisted and useful in therapeutic effect.

13. The Future of *Carica papaya* Leaf Extract as an Herbal Medicine Product

Maywan Hariono et.al in 2021 had researched on the future of *Carica papaya* leaf extract as an herbal medicine product has focused on the *Carica papaya* leaf extract has been for longer time in the traditional medicine to treat dengue, malaria, chickungunya. In the development of the new techniques in the technology and science ultimately made it even possible to make condition which provide evidence haing plant is beneficial in both informal medication and formal usage in professional health care system.

14. Nutrient Composition of *Carica Papaya* Leaves Extract

Nwamarah Joy Ugo et.al in 2019 has

studied the Nutrient composition of *Carica papaya* leaves extract. The finding of their study revealed the presence of different composition of different constituents such as moisture (57.01%), fat (2.01%), ash (2.18%), protein (6.50%), crude fibre (3.10%) and carbohydrate (29.20%). Vitamins C (68.59 mg/100g), Beta carotene (303.55 mg/100g), B1 (199.31 mg/100g), B2 (295.63 mg/100g) and vitamin E (39.78 mg/100g). Etc. Their study established that the presence of this constituents could be beneficial for human health.

15. Morphology, Phytochemistry and Pharmacological Aspects of *Carica Papaya*, An Review

Ashish B. Wadekar et.al in 2021 has studied the morphology. Phytochemical and pharmacological aspects of *Carica Papaya*. They found that phytochemically whole plant contains lycopene, caretinoid, alkaloid, minerals, vitamins and enzyme papain, etc. And in the pharmacological aspects, they found various medicinal properties of *Carica papaya* such as anti-cancer property, insecticidal, wound healing property etc.

III. OVERVIEW OF PAPAYA PLANT

Biological Source: Papain is the dried and purified latex of the green fruits and leaves of *Carica papaya* L., belonging to family Caricaceae. The plant is 5–6 m in height bearing fruits of about 30 cm length and a weight up to 5 kg.

Family Name: Caricaceae

Kingdom: Plantae

Sub Kingdom: Tracheobionta

Class: Magnoliopsida

Subclass: Dilleniidae

Super division: Spermatophyta

Phyllum: Steptophyta

Order: Brassicales

Family: Caricaceae

Genus: *Carica*

Botanical name: *Carica papaya* Linn.

Common name:

India- Papaya, Papae

Southern Asia and East Indies -Kapaya, kepay, lapaya and tapaya

Australia and West Indies- Papaw or paw paw

Brazil- tree melon

Vietnam- Du du

New Zealand- Papaw

France- Papaya

Part Used: Leaves, Fruits, bark, leaves

Leaves:

The leaves are spirally arranged in a terminal cluster, simple, on petioles 30-70 cm long. The margins of the lobes are very variable, and range from entire to undulate to deeply lobed. The leaves are rounded in outline, 60-90 cm in diameter, alternately arranged, bundled at the apex between stem and branches, long petioles; widely evident, 25-75 cm diameter, smooth, moderately palm shape with thick middle irradiant veins, the The bundle of leaves is dark green to yellow-green, bright, visibly marked by the off-white nerves embedded (10).

Fruits:

An ovoid-oblong berry pyriform or almost cylindrical, large, fleshy, juicy, grooved along the upper longer side, green yellow to yellow or yellow-orange colour.

IV. MATERIALS & METHOD

• **Collection-** Sample of Carica Papaya Leaves Extract were collected from Ozar Village, Nashik, India & were authenticated in Department of Pharmacognosy, P.R.E.S's College of Pharmacy, Chincholi, Nashik(1)

• **Sample Preparation-**

Freshly collected leaves were cleaned and sun-dried before they were pulverized using mortar and pestle into smaller particles after which they were blended to powder using an electric blender.(1)

• **Extract Preparation-**

Sample No.	Carica Papaya Leaves Powder	Solvent Used	Polarity of solvent	Quantity Of Solvent	Time
1- (Carica Papaya leaves extract in Ethanol)	50 gm	Ethanol	0.654	250 ml	48 hrs
2- (Carica Papaya leaves extract in Methanol)	50 gm	Methanol	0.762	250 ml	48 hrs

Table No.1- Extract Preparation

After 48 hours, the suspensions were shaken vigorously and filtered using whatman filter paper No.42.(1,11)

1. Determination of Ash Value- Determination-

1. Weigh accurately about 4 gm of the powdered drug in a tarred silica crucible.
2. Incinerate the powdered drug by gradually increasing the heat by using a Muffle furnace until free from carbon and cool. Keep it in a desiccator.
3. Weigh the ash and calculate the percentage of total ash concerning the air-dried sample (1,12)

2. Phytochemical Test-

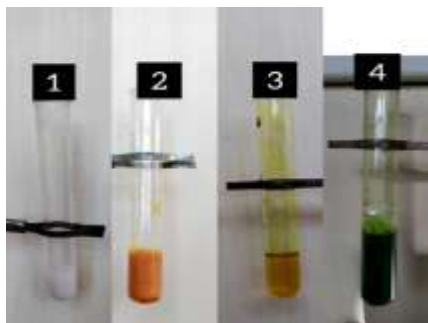


Figure No.1- Carica Papaya Leaves Ethanol Extract

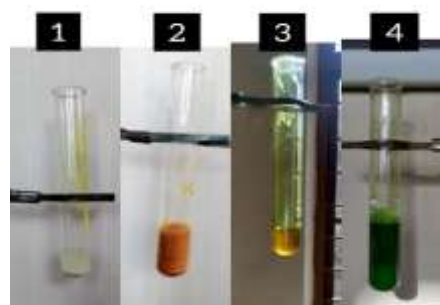


Figure No.2- Carica Papaya Leaves Methanol Extract

1. Test For Alkaloids-3ml extract+ 1 ml 1% HCL +0.5 ml mayer's reagent, Cream White Colour Developed
2. Test For Flavonoids-3ml extract+ 2ml dist. Water+ 1ml 10% NaOH, Yellow Colour Occur
3. Test For Saponins- 3ml extract +2 ml dist. Water And Shake, Frothing is seen
4. Test For Phenol- 1ml extract+ 1 ml dist. Water+ 3-4 drop 5% NaOH, Orange Colour Developed(1,15)

3. TLC Preparation-



Figure No.3- TLC of Carica Papaya Leaves Extract In Ethanol



Figure No.4- TLC of Carica Papaya Leaves Extract In Methanol

Determination-

o **Stationary phase-** A slurry of adsorbent Silica gel is prepared with sufficient quantity of water.

o **Mobile Phase-**

i)For Ethanol Extract of Carica papaya leaves- Ethanol:Water (50:50)

ii) For Methanol Extract of Carica papaya leaves- Methanol:Water (50:50) (1,14,15)

4. IR Spectrum Of Sample 1 and Sample 2-

Determination-

1. Turn on the IR spectrometer and allow it to warm up.
2. Obtain an unknown sample from the instructor and record the letter and appearance of the sample
3. Collect a background spectrum.
4. Using a metal spatula, place a small amount of sample under the probe.
5. Twist the probe until it locks into place.
6. Record the IR spectrum of the unknown sample.
7. Repeat if necessary to obtain a good quality spectrum.

8. Record the absorption frequencies indicative of the functional groups present.
9. Clean the probe with acetone.
10. Turn off the spectrometer, Analyse the obtained spectrum.(1,15,16)

• **Carica Papaya Leaves Extract Gel Formulation-**

Preparation- the polymer such as carbopol and antioxidant BHT of 4g and 0.1 g respectively dissolved in water and name it phase 1. Then prepared carica papaya leaves extract in ethanol 1 ml is dilute with the isopropyl alcohol of 10 ml and name as phase 2, mix both the phase with the continuous stirring. Transfer in wide mouth container close the cap. Label it and place at cool and dry place. (9,18)



Figure No. 5- Carica Papaya Leaves Extract Gel

❖ **Characterization Of Carica Papaya Leaves Extract gel-**

1. **pH Determination-**

Determination- The pH of gel is determine by using a digital pH meter. Take the mean of three reading for accuracy in determination.(9)

2. **Swelling Index Determination-**

Determination-

1 gm of formulation is taken in the periplate containing the 10 ml of distilled water. keep the plate undisturbed in the dry place till the external liquid will get removed and then weighed.(9)

It calculated by given formula.,

$$\text{Swelling Index (SW)\%} = [(W_t - W_0) / W_0] \times 100$$

Where, SW- Swelling Index;

W_t- weight of gel after get swollen;

W₀- initial weight of gel before get swollen(9)

3. **Spreadability Determination-**

Determination-

1 g of gel was place within the 1 cm diameter of circle on glass plate, on which a other glass plate was placed. A 500 g weight allowed to put on upper glass plate for 5 minute. Then the diameter due to gel has been spreading was noted(9).

4. **Viscosity Test-**

Determination-

-Connect the all assembly properly.

-Fill the sample container and fill the sample container according then select the spindle.

-Connect the spindle. Insert the spindle in the circulatory jacket .

-Screw with the viscometer axle so turns it clockwise Sample level should be checked that in middle of the cone, which connected with spindle connector.

-Place the upper stopper over the sample container and start the viscometer and note the reading.(22)

V. RESULTS & DISCUSSION

Result-

1. Ash Value Determination-

Sample	Weight of empty Porcelain (W1)	Weight of porcelian with sample before ashing (W2)	Weight of porcelian with sample after ashing (W3)	Standard value	Ash Value $\frac{(W3 - W1)}{(W2 - W1)} \times 100$
Carica Papaya Leaves Powder	41gm	42	41.11	9.2% to 11.2%	11%

Table No.2- Ash value determination

2. Phytochemical parameter of carica papaya leaves extract-

Phytochemical Test	Ethanol Extract	Methanol Extract
Test For Alkaloids	++	+
Test For Flavonoids	++	+
Test For Saponins	+	+
Test For Phenol	+	+

(Note-+ Present ; ++ Highly Present)

Table No.3- Phytochemical parameters pf carica papaya leaves extract

3. Thin Layer Chromatography- TLC of Carica Papaya Leaves Extract in Ethanol-

Sr.No	Sample	Distance Travelled by Solvent	Distance Travelled by Solute	Rf Value
1	Standard	5	3.15	0.63
2	Sample			
	Spot 1	5	3.2	0.64
	Spot 2	5	3	0.6 <u>mean- 0.62</u>
	Spot 3	5	3.1	0.62

Table No.4- TLC of carica papaya leaves extract in ethanol

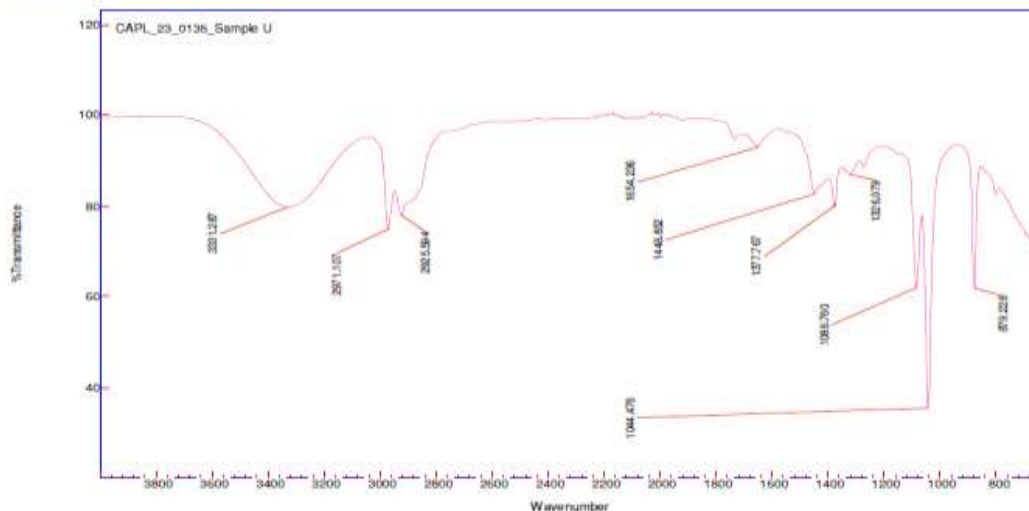
TLC of Carica Papaya Leaves Extract In Methanol-

Sr.No	Sample	Distance Travelled by Solvent	Distance Travelled by Solute	Rf Value
1	Standard	5.2	4.056	0.78
2	Sample			
	Spot 1	5	3.75	0.75
	Spot 2	5	3.95	0.79 <u>mean- 0.75</u>
	Spot 3	5	3.6	0.72

Table No.5- TLC of carica papaya leaves extract in methanol

**4. IR Spectrum Of Sample 1 and Sample 2-
 Sample-(1) Carica Papaya leaves extract in Ethanol**

Agilent Resolutions Pro



Name
 CAPI_23_0135_Sample U

Peak List	Center	Area	Height	Left Edge	Right Edge
Peak1	879.228	-0.000	-61.825	879.228	879.228
Peak2	1044.476	-0.000	-35.556	1044.476	1044.476
Peak3	1086.760	-0.000	-62.236	1086.760	1086.760
Peak4	1326.079	-0.000	-87.208	1326.079	1326.079
Peak5	1377.767	-0.000	-80.333	1377.767	1377.767
Peak6	1448.852	-0.000	-82.913	1448.852	1448.852
Peak7	1654.236	-0.000	-93.118	1654.236	1654.236
Peak8	2925.594	-0.000	-78.216	2925.594	2925.594
Peak9	2971.107	-0.000	-75.193	2971.107	2971.107
Peak10	3331.287	-0.000	-79.992	3331.287	3331.287

Table No.6- IR of sample 1

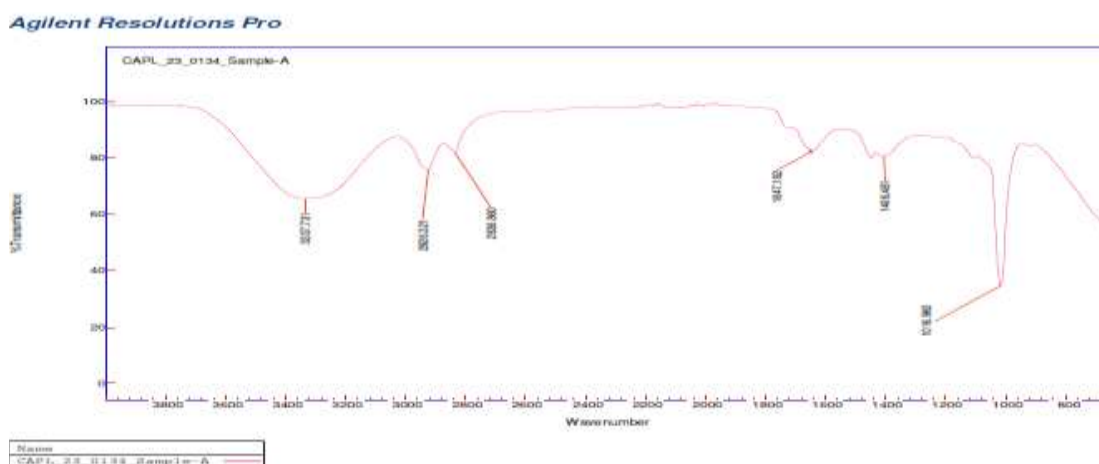
Interpretation

Peak	Absorption (cm ⁻¹)	Absorption Range	Appearance	Group	Compound Class
1	879.228	-	-	-	-
2	1044.476	1250-1020	medium	C-N	amine
3	1086.760	1085-1050	strong	C-O	primary alcohol
4	1326.079	-	-	-	-
5	1377.767	-	-	-	-
6	1448.852	1450	medium	C-H	alkane
7	1654.236	1662-1626	medium	C=C	alkene
8	2925.594	3000-2800	strong	N-H	amine salt
9	2971.107	3000-2800	strong	N-H	amine salt

10	3331.287	3350-3310	medium	N-H	Secondary amine
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Table No.7- Interpretation of IR of sample 1

Sample-(2) Carica Papaya leaves extract in Ethanol-



Peak List	Center	Area	Height	Left Edge	Right Edge
Peak1	1016.960	-0.000	-34.869	1016.960	1016.960
Peak2	1406.481	-0.000	-80.794	1406.481	1406.481
Peak3	1647.182	-0.000	-82.568	1647.182	1647.182
Peak4	2836.860	-0.000	-81.990	2836.860	2836.860
Peak5	2926.321	-0.000	-76.067	2926.321	2926.321
Peak6	3337.731	-0.000	-65.697	3337.731	3337.731

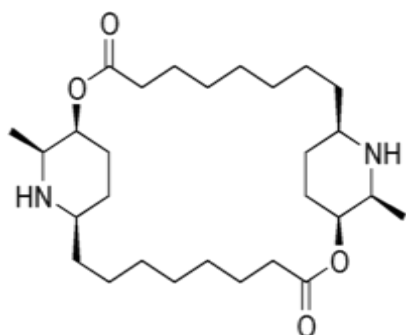
Table No.8- - IR of sample 2

Interpretation-

Table No.9- Interpretation of IR of sample 2

Peak	Absorption (cm ⁻¹)	Absorption Range	Appearance	Group	Compound Class
1	1016.960	-	-	-	-
2	1406.481	-	-	-	-
3	1647.182	1648-1638	strong	C=C	alkene
4	2836.860	2830-2695	medium	C-H	aldehyde
5	2926.321	3000-2800	strong	N=H	amine salt
6	3337.731	3330-3250	medium	N-H	secondary amine

So as interpretation of sample 1 and sample 2 the carpine group may be present.



❖ **Characterization of Carica Papaya Leaves Extract gel-**

1. **pH Determination-** pH of the papaya leaf gel was observed to be 6.89 by the mean of three

reading by using pH meter that is 6.87, 6.89, 6.93 respectively.

2. **Swelling Index Determination-** (SW)% = $[(Wt-W_0)/W_0] \times 100$

$[(3.20-1)/1] \times 100$ SW% =

= 220%

The swelling index of herbal gel was 220%.

3. **Spreadability Determination-** The diameter of the spot was observed within 3.1-3.3 cm

4. **Viscosity Determination-** The average viscosity were found to be 31869 cP at 77.77% at 23.4°C



No	Torque	Viscosity
1	84.0%	17492 cP
2	79.9%	24956 cP
3	78.3%	39165 cP
4	74.3%	37133 cP
5	72.3%	60223 cP

Table No.10- Viscosity Determination

VI. DISCUSSION-

The ash value of carica papaya leaves powder has been determine and the ash value has been find to be 11%. This ash values lies in

between standard value that is 9.2% and 11.2%. so it confirms that the determination is complies with standard once. The phytochemical parameters in carica papaya leaves extract in methanol and

ethanol has been performed to see the presence of alkaloids, flavonoids, saponins and phenol. The presence of alkaloids and flavonoids in the ethanol extract is found in high content than the methanolic extract. Ultimately the presence of saponins and phenol were present in same amount in both ethanol and methanol extract of carica papaya leaves extract. That's found that the ethanolic extract of carica papaya leaves shows great presence of phytochemicals in it, so it can be use in the preparation of herbal gel. For better confirmation of purity and progress of reaction thin layer chromatography were performed for the carica papaya leaves extract in ethanol and methanol. The Rf value of carica papaya leaves extract in ethanol is found to be 0.62 and with compared with standard one that is 0.63 it complies the test and the Rf value of carica papaya leaves extract in methanol is found to be 0.75 and with compared with standard one that is 0.78 it complies the test that means our both the samples are pure. The IR spectra of carica papaya leaves extract in ethanol and methanol has been performed the see the better confirmation of functional group present in the both the sample. In ethanol extract the amine, primary alcohol, alkane, alkene, amine salt, secondary amine, were present in medium to strong appearance. The absorption are 879.228, 1044.476, 1086.760, 1326.079, 1377.767, 1448.852, 1654.236, 2925.594, 2971.107, 3331.287 cm^{-1} respectively on IR spectra of ethanol extract. In methanol extract the alkene, aldehyde, amine salt, secondary amine, were present in medium to strong appearance. The absorption are 1647.182, 2836.860, 2926.321, 3337.731 cm^{-1} respectively on IR spectra of methanol extract. Hence it proves that presence of functional group in ethanol extract of carica papaya leaves is found to be more than methanol extract of carica papaya leaves. From that all interpretation the carpaine group is may be present. So, the carica papaya leaves extract gel were prepared by using ethanol extract due to highly presence of phytochemicals and from that the gel the pH, swelling index, and spreadability determination were done. The pH is found to be 6.89 and compared with standard 6.5 it is complies the test. The swelling index were found to be 220% and the spreadability within 3.1-3.3cm. The viscosity of gel is found to be nearly 31869 cp at 77.77% torque approximately at 23.4°C.

VII. CONCLUSION & SUMMARY

In this study, main importance was given on the extraction and Characterization of carica

papaya leaves extract in ethanol and methanol solvent. Carica Papaya have a history of use in folk medicine. Due to phytochemicals present in it; the pharmacology shows that it having antimicrobial, antipyretic activity as well as excellent antimalarial.

Our Study mainly focused on:

- Extraction and characterization of Carica Papaya leaves by using suitable method.
- Identification of extracted Carica Papaya Leaves was done by using different techniques such as Chemical tests, Ash Value determination, Thin layer Chromatography, IR spectrum and the results obtained in each case were compared with the result of a standard.
- This study can give a scope for the development of Carica Papaya Leaves Extract. All results are obtained in our Lab condition of our Institute.
- The Gel which has been prepared has additional characteristics features like moisturize the skin, remove tan, enhance the glow of skin.

So after Conducting Series of experiments, we can conclude that the Carica Papaya Leaves which is extracted is pure. The study was related to formulation and characterisation of papaya leaf gel. The papaya leaf gel was prepare by using polymer and the characterisation of the gel was carried out; therefore we can also state that the it is highly beneficial for human body. Further studies are required for future aspect.

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