



E-ISSN: 2706-8927

P-ISSN: 2706-8919

www.allstudyjournal.com

IJAAS 2022; 4(4): 101-104

Received: 26-08-2022

Accepted: 29-09-2022

Md. Zainul Abedeen

Students of K. R College of pharmacy, Rajiv Gandhi University of Health Science, Bangalore, Karnataka, India

Jyothi NV

Students of K. R College of pharmacy, Rajiv Gandhi University of Health Science, Bangalore, Karnataka, India

Sahil Suleman

Students of K. R College of pharmacy, Rajiv Gandhi University of Health Science, Bangalore, Karnataka, India

Health benefits of papaya

Md. Zainul Abedeen, Jyothi NV and Sahil Suleman

Abstract

Papaya (*Carica papaya* L.) is well known for its exceptional nutritional and medicinal properties throughout the world. From the past, the whole Papaya plant including its leaves, seeds, ripe and unripe fruits and their juice is used as a traditional medicine. The fruit has a large oval shape, yellowish – green and yellow flesh. Phytochemically it contains the enzymes papain, chymopapain, which is biologically active and has medicinal and nutritional value. They also contain carotenoids, alkaloids, monoterpenoids, flavonoids, minerals and vitamins. Nowadays, Papaya is considered as a Nutraceutical fruit due to its multifaceted medicinal properties. The important medicinal properties of Papaya include – Anti-fertility, Uterotonic, Diuretic, Anti-hypertensive, Hypolipidemic, Anti-helminthic, Wound-healing, Anti-fungal, Anti-bacterial, Anti-tumor and free radical scavenging activities¹. Papaya is rich in enzymes papain which is effective against cancer. Papaya leaf extract has been used for a long time in a traditional medicine to treat fever in some infectious disease such as dengue, malaria and chikungunya.

Keywords: Papaya peel, papaya powder, papaya flower, papaya seed powder, papaya fruits nutritional and medicinal value

Introductions

Papaya is a powerhouse of nutrients and is available throughout the year. It is rich source of powerful antioxidant vitamin C, vitamin A, and vitamin E, the minerals, magnesium and potassium. All the nutrients of papaya as a whole improve cardiovascular system, protect against heart disease, heart attacks, stroke and prevent colon cancer. Papaya effectively treats and improves all types of digestive and abdominal disorder. It is a medicine for dyspepsia, hyperacidity, dysentery and constipation. Papaya helps in the digestion of proteins as it is a rich source of proteolytic enzymes. Ripe fruit consumed regularly helps in habitual constipation. The fruit is regarded as a remedy for abdominal disorder. The skin of papaya works as a best medicine for wounds. The enzymes papain and chymopapain and antioxidant nutrients found in papaya have been found helpful in lowering inflammation and healing burns. Papaya contributes to a healthy immune system by increasing your resistance to cough and cold because of its vitamin A & B content. Papaya included in your diet ensure a good supply of vitamin A&C that are highly essential for maintaining a good health^[4]. Gift of nature is medicinal plants to provide disease free healthy life as they play an important role in protective health^[5]. In India covered by tropic and sub-tropic regions that become the main source of aromatic and medicinal plant (AMPs) biodiversity to create solid establishment foundation in traditional medicine^[5]. Papaya, a juicy and tasty fruit, belonging to family caricaceae is scientifically known as *Carica Papaya* L. It is grown in various parts of the world including India, tropical America & Europe. Papaya tree is basically a short lived India tree^[1]. Papaya was the first genetically modified fruit consumed by human beings for its nutritional and medicinal properties. In cosmetics, black hair dyes and face masks can be made from papaya seeds and leaves respectively^[6]. Papaya seeds constitute 15% - 20% mass of fruit that represent a considerable amount of papaya seeds have the potential to produce 30% - 34% oil with nutritional and functional properties highly similar to olive oil.

Corresponding Author:

Md. Zainul Abedeen

Students of K. R College of pharmacy, Rajiv Gandhi University of Health Science, Bangalore, Karnataka, India



Fig 1: Ripe Papaya fruit



Fig 2: Raw Papaya plant

Table 1: Botanical Classification of Papaya [8].

Domain	Flowering
Kingdom	Plantae
Subkingdom	Tracheobinate
Class	Magnoliopsida
Subclass	Dilleniidae
Division	Magnoliophyta
Superdivision	Spermatophyta
Phylum	Streptophyta
Order	Brassicales
Family	Caricaceae
Genus	Carica

History

Papaya is native to tropical America. It was found in Southern Mexico and throughout the Andes of South America. Papaya was called as the fruit of the angles by Christopher Columbus. By the mid 17th century, Papaya was introduced to Hawaii in 18th century and Hawaii remains the only state in the USA to produce Papaya commercially [7].

Geographical distribution

Cultivation of Papaya is done almost in all parts of world. It is indigenous to tropical America & cultivated on large scale in Sri Lanka, Tanzania, India, Hawaii, Florida, South Africa & Australia. In India Papaya is cultivated in Maharashtra, Bengal, Bihar, Haryana, Punjab, Delhi, Andhra Pradesh, Uttar Pradesh [1].

Botanical Description

Plant

Papaya plant is a large single stemmed herbaceous perennial tree having 20-30ft height. The leaves are very large (upto 2.5ft wide), palmately lobed or deeply incised with entire margins and petioles of 1-3 ft in length. Stems are hollow light green to tan brown in color with diameter of 8 inches and bear prominent leaf scars.

Fruit

The fruit are big oval in shape and sometimes called pepo-like berries. Since they resemble melon by having a central seed cavity. Fruits are borne axillary on the main stem, usually singly but sometimes in small clusters. Fruits weight from 0.5 upto 20lbs and are green until ripe, turning yellow or red –orange. Flesh is yellow orange to salmon (pinkish orange) at maturity. The edible portion surround the large central seed cavity. Individual fruits mature in 5-9 month, depending on cultivar & temperature. Plant begin bearing fruit in 6-12 month. A male Papaya is distinguished by the smaller flowers borne on long stalks. Female flowers of Papaya are pear shaped, when unopened whereas bisexual flowers are cylindrical [9].

Pollination

Bisexual flowered plants are self- pollinating but female plants must be cross pollinated by either bisexual or male plants [1].

Nutritional and phytochemical substance

Nutraceutical and cosmeceutical products are formulated with the consideration of a few factors in which either nutritional or phytochemical substance play the most essential role in health effect. A number of articles have reported on these aspects in general, the nutrient of papaya leaves can be categorized as macromolecules, fiber, minerals and vitamins [6].

Table 2: Nutrients

Nutrients	%
Protein	5.8
Lipid	1.4
Carbohydrates	78.2
Fibre	13.1
Energy	348.6 kcal
Sodium	Not Determined
Potassium	0.534
Phosphorous	0.221
Magnesium	0.032
Iron	0.006
Calcium	0.366
Vitamin C	0.031
Vitamin B9	Not Determined
Vitamin B6	Not Determined
Vitamin B3	0.003
Vitamin B2	0.0001
Vitamin B1	0.004
Vitamin A	Not Determined
Beta carotene	659.5 IU

Table 3: The phytochemical contents of the 100gm leaf, young fruits and ripe fruits of C. Papaya [2].

Sl. No.	Name of phytonutrients	Leaves	Unripe	Ripe
1	Calories	79cal	26cal	46cal
2	Vitamin A	18250 SI	50 SI	365 SI
3	Vitamin B1	0.15 mg	0.02 mg	0.04 mg
4	Vitamin C	140 mg	19 mg	78 mg
5	Calcium	353 mg	50 mg	23 mg
6	Hydrate charcoal	11.9gm	4.9gm	12.2gm
7	Phosphorous	0.0 mg	16 mg	12 mg
8	Iron	0.8 mg	0.4 mg	1.7 mg
9	Protein	8.0gm	2.1gm	0.5gm
10	Water	75.4gm	92.4gm	86.7gm

Therapeutic and medicinal uses

1. Anti- fertility

The antifertility effects of Carica Papaya were investigated by feeding adult and pregnant rats with different components of the fruit. Chloroform extract of Carica Papaya induced long term azoospermia in Langur Monkey. The extract gradually decreases the sperm concentration and sperm motility after 30-60 days of treatment. Azoospermia was observed after 90 days of treatment and continued during the whole treatment period [10].

2. Wound Healing

Wound healing entails a sequence of complex biological processes, which is a protective function of the body that focuses on quick recovery. Reducing the wound healing time is crucial in a wound as it lowers, the chance of infection and decrease complications and costs. Diabetic wound are slow, non-healing wound that can persist for weeks despite adequate and appropriate care. Carica Papaya extract showed wound healing properties after its topical application in streptozotocin – induced diabetic rats. Traditionally, Papaya is an herbal treatment in developing countries for burns, soft tissue wound and skin infection [11].

3. Malarial Activity

Malaria is still the most important parasitic disease in the world & caused by the protozoans belong to the genus plasmodium. Larvicidal and Pupicidal activity of ethanol extract of Carica Papaya leaf extract (CPLE) at various concentration against malarial vectors. The antimalarial activity of ethanolic leaf extract of Carica Papaya against Plasmodium Falciparum. The four concentration of ethanolic leaf extracts exhibited promising IC50(ug/ml) of 25,50,100 and 150, respectively also against the CQ sensitive and control 40.75, 36.54, 25.30, 18.0 & 1.0 CQ resistant and control 50.23, 32.50, 21.45, 23.12 & 5.0 against malaria parasite P. Falciparum [12].

4. Anti-tumour

Carica Papaya leaf juice is consumed for its purported anti-cancer activity by the people living on the Gold Coast of Australia [9]. Aqueous extract of Carica Papaya leaf had the antitumor effect on the proliferative response of solid and haematopoietic tumor cell lines. Carica Papaya extract inhibited the proliferative response of solid tumor cell lines derived from cervical carcinoma, breast carcinoma, pancreatic epithelioid carcinoma, hepatocellular carcinoma and mesothelioma in a dose dependent manner [13].

5. Uterotonic activity

The aqueous extract of unripe Carica Papaya fruits possess significant uterine stimulant properties. The uterine stimulant activity may be due to the inhibition of progesterone levels in plasma or elevation of estrogen levels in plasma [23].

6. Nephro- protective activity

The elevation in serum concentration of urea and creatinine are indicative of renal injury. Nephro -protective effects of aqueous extract of the unripe seeds of Carica Papaya in CCL4 induced renal injury in wistar rats was observed in a dose related manner [15].

7. Anthelmintic activity

Aqueous extract of the seeds of the Papaya showed anthelmintic property against Ascaris Lumbricoides and Ascaridia galli [16].

8. Dengue Fever

The potential of Carica Papaya leaves extracts against Dengue Fever [17].

9. Faciliate Digestion

The leaves of the Papaya plants contain chemical compounds of Karpain substance which kills micro-organism digestive function [18].

10. Anticoagulant Effect

Injection of Papain extract in a dog increase prothrombin and coagulation threefold. It is also claimed that the enzyme eliminates necrotic tissue in chronic wounds, burns and ulcers [19].

11. Cosmetic Benefits

Rubbing the white pulp of raw Papaya improves pimples as well as wrinkles. Papaya works as a good bleaching agent. It is an important in both soaps, astringents, detergent bars and hand washes. Home recipe for Papaya skin lighter experts suggest that Papaya can help in removing dead worn out skin cells and replace it with healthy new cells, thereby lightening the color of our skin. For this, one can prepare a paste of raw Papaya and apply it on the skin once for few days [20].

12. Antioxidant Properties

Antioxidants are radical scavengers which protect the human body against free radicals that may cause pathological conditions such as ischemia, asthma, arthritis, inflammation, neurodegeneration, Parkinson's disease, mongolism, the ageing process and perhaps dementias. Carotenoids, Flavonoids, Folic acid, Ascorbic acid & tocopherol are among the antioxidants produced by plants for their substance. These antioxidants are polyphenol compounds found in all plants [21].

13. Heart Diseases

The fiber, potassium and vitamin content in Papaya all help to ward off heart diseases. An increase in potassium intake along with a decrease in sodium intake is the most important dietary change that a person can make to reduce their risk of cardiovascular disease [22].

14. Hair Health

Papaya is also great for hair because it contains vitamin A, nutrient required for sebum production, which keeps hair moisturized. Vitamin A is also necessary for the growth of all bodily tissue, including skin & hair. Adequate intake of vitamin C which papaya can provide is needed for the building and maintenance of collagen, which provides structure to skin [22].

15. Anti-amoebic activity

The seeds of papaya demonstrated *in vitro* anti amoebic activity [23].

References

1. Parle Milind, Gurditta. Basketful benefits of papaya, international research journal of pharmacy; c2011.
2. Dr. Neethu S Kumar, Sreeja Devi PS. The Surprising Health Benefits of Papaya seeds: A review Journal of Pharmacognosy and phytochemistry; c2017.

3. Bhosale PC, Madavi AB, Udachan IS. Development of functional cookies by utilization of Papaya peel and seed powder, 2018, Research Gate.
4. Aravind G, Debjit Bhoutmik, Dueaivel S, Harish G. Tradition and Medicinal uses of Carica Papaya, Journal of Medicinal Plants Studies; c2013.
5. Sagadevan P, Selva Kumar S, Raghunath M, Megala R, Janarthanan P, Vinitha Ebziba C, *et al.* Medicinal properties of Carica Papaya Linn. Review Madridge Journal of Novel drug Research; 2019. DOI-10.18689/mjndr-1000118.
6. Maywaan Hariono, Jeffry Julianus, Ipang Djunarko, Irwan Hidayat, Lintang Adelya, Friska Indayani, *et al.* The future of Carica Papaya leaf extract as an herbal medicine product, MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliation; c2021.
7. Shaistha Saba, Dr. Neeta Pattma. The Potential Health Benefits of Papaya Seeds, Ijreset Journal For Research in Applied science and Engineering Technology; c2013. DOI: <https://doi.org/0.22214/ijreset.2022.39271>.
8. Anitha B, Raghu N, Gopenath TS, Karthikeyan M, Gnanasekaran A, Chanddraskrappn GK, Basalingappa KM. Medicinal uses of Carica Papaya, Journal of Natural and Ayurvedic medicine; c2018.
9. Kaliyaperumal Karunamoorthi. Hyung – Min Kim, Kaliyaperumal Jegajeervanram. Jerome Xavier, Jayaraman Vijayalakshmi, Papaya: A gifted nutraceutical plant- a critical review of recent human health research; c2014. Tang Humanitas Medicine, DOI: <http://dx.doi-org/10.5657/tang> 2013.0028.
10. Chinaka O Nwaehujor, Julius O Ode, Mercy R Ekwere, Rita I Udegbunam. Anti-fertility effects of fractions from Carica papaya (Pawpaw) Linn. Methanol root extract in male Wistar rats. Arabian Journal chemistry; c2019. DOI: <http://dx.doi.org/10.1016/j.arabjc.2014.10.018>
11. Rachmi Fanani Hakim, Fakhruuazi, Dinni, Effect of Carica papaya extract toward Incised wound Healing process in Mice (*Mus musculus*) clinically and histologically; c2019, Hindawi, DOI: <https://doi/10.1155/2019/8306519>
12. Kovendan K, Murugan K, Panneer Selvam C, Aarthi N, Mahesh Kumar P, Subramaniam J, *et al.* Vincent, Anti - malarial activity of Carica Papaya (family: Caricaceae) leaf extract against plasmodium falciparum, Asian Pacific Journal of Tropical Disease; c2012.
13. Noriko Otsuki, Nam H Oang, Emikunagai, Akira Kondo, Satoshi Iwata, Chikao Morimoto. Aqueous extraction of Carica Papaya leaves exhibits anti-tumor activity and immunomodulatory effects, Journal of ethnopharmacology; c2010.
14. Ahmed El-Abd Ahmed, Mohammed H Hassan, Abeer S Esmael, Nagwan I Rashwan. Role of vitamin D and its receptors genes in the pathophysiology of nephrotic syndrome: Review article. Int. J Adv. Biochem. Res. 2021;5(2):40-45. DOI: 10.33545/26174693.2021.v5.i2a.75
15. Olegunju JA, Adeneye AA, Fagbohunka BS, Biruga NA, Ketiku AO, Benebo AS, *et al.* Nephro- protective activities of the aqueous seed extract of Carica Papaya Linn. in carbon tetrachloride induced renal injured wistar rats: a dose and time- dependent study. Biology and medicine. 2009;1(1):11-19.
16. Ameen SA, Adedeji OS, Ojedapo, Salihu T, Fakorede OL. Anthelmintic efficacy of pawpaw (*Carica papaya*) seeds in commercial layers. African Journal of Biotechnology. 2012;11(1):126-130. DOI:105897/AJB102040
17. Nisar Ahmd, Hina Fazal, Muhammad Ayaz, Bilal Haidar Abbasi, Ijaz Muhammad, Lubna Fazal. Denuc Fever treatment with Carica Papaya Leaves extracts; c2011, Asian Pacific Journal of Tropical Biomedicine, DOI:10.1016152221-1691(11)60055-5
18. Claus Muss, Wilhelm Mosgoeller, Thomas Endler. Papaya preparation (carica®) in digestive disorder. Randomized Control Trial, PMID, 2013, 23524622
19. Meisy Sitiawani, Zikra Azizah, Ridho Asra. Boy Chandra, Review: Phytochemical of some plants with Anticoagulant, Asian Journal of pharmaceutical Research and Development; c2022. DOI: <https://dx.doi.org//10.22270/ajprd.v10i41157>
20. Cynthia Cobb, DNP, APRN, COHNP-BC, FAANP, Benefits of papaya for your skin and hair 2019, health line
21. Irda Fidrianny, Khoirunnisa Ayu Paramitha, Siti Kusumardiyani. Antioxidant activities from various leaves extract of three cultivars of papaya from west Java Indonesia, Asian Journal of pharmaceuticals and clinical Research; c2016.
22. Megan Ware, Health benefits of papaya, 2017 Medicinal use Today Sabaa Tahier Mohammed, Sahar A.H. AL Shargi and Nidaa Mohammed, Antiparasitic activity of natural plant carica papaya seed extract against Gastrointestinal Parasite Entamoeba histolytica, International Journal of innovation and applied studies; c2014.
23. Meera Sumanth, Ugendra K. Effect of unripe carica papaya on uterus, Moksha publishing house; c2013.