



## A Review on Medicinal Properties of *Carica Papaya* Linn.

<sup>1</sup>Rathod Abhay Dnyaneshwar, <sup>2</sup>Asst. Prof. Vandana V. Shirsath.

<sup>1</sup>Shree Mahavir Institute of pharmacy, Nashik

<sup>2</sup>Shree Mahavir Institute of pharmacy, Nashik (422004)

### Abstract –

*Carica papaya* L. leaves are of interest as a potential therapeutic agent to alleviate dengue and non-dengue-associated thrombocytopenia. The fruit is healthy and delicious, and all parts of the plant are known to have medicinal properties: fruit, root, bark, peel, seed and pulp. Papaya's many benefits are due to its high levels of vitamins A, B, and C, which have antiviral, antifungal, and antibacterial properties, and proteolytic enzymes such as papain and chymopapain. The milky sap is extracted, dried and used as chewing gum, toothpaste, and meat tenderizer for digestive problems. It is also an ingredient used to support the digestive system and treat arthritis. It contains many biologically active compounds, including chymopapain and papain. Widely used in many countries.

**Keywords** – introduction, nutritional value, traditional and pharmacological properties

### 1. INTRODUCTION –

Papaya is a rich source of nutrition and available all year round. Rich in three powerful antioxidants: vitamin C, vitamin A and vitamin E. Minerals include magnesium and potassium, the B vitamins pantothenic and folic acid, and fiber. Herbs have earned their place high because synthetic drugs are unsafe and bad for the environment. As a result, an herbal renaissance is taking place around the world. Additionally, it contains the digestive enzyme papain, which effectively treats causes of trauma, allergies and sports injuries. All the nutrients in papaya improve the cardiovascular system as a whole, protect against heart disease, heart attack and stroke, and prevent colon cancer. Rich in antioxidants. This fruit also contains a digestive enzyme known as papanitha, which is effective in treating sports injuries, trauma and allergies.

Papaya, *Carica Papaya* (*C. papaya*) L. It is one of the most important fruit crops grown in 6+ worldwide. Covering approximately 389,990 hectares, over 6.8 million tons of fruit were produced in 2004 (FAO 2004). Of this, 47% was produced in Latin America (mainly Brazil), 30% in Asia and 20% in Africa. Brazil's papaya industry is one of the largest in the world and continues to grow rapidly.

Papaya effectively treats and improves all kinds of digestive and abdominal ailments. It is a medicine for indigestion, hyperacidity, dysentery and constipation. Papayas are a rich source of proteolytic enzymes, which aid in the digestion of proteins. Even papain, the digestive enzyme found in papaya, is extracted, dried into a powder, and used as a digestive aid. *Carica papaya* contains two active ingredients, chymopapain and papain, which are widely useful for indigestion and gastrointestinal disorders. Papain tolerates acidic pH and does not denature. The nutritional value of papaya helps prevent oxidation of cholesterol. Papaya is rich in iron and calcium. Unripe papaya extract contains terpenoids, alkaloids, flavonoids, carbohydrates, saponins and steroids.

**Table 1 -Botanical classification**

Domain	Flowering plants
Kingdom	Plantae
Sub-kingdom	Tracheobionta
Class	Magnoliopsida
Subclass	Dilleniidae
Division	Spermatophyta
Phylum	Steptophyta
Order	Brassicales
Family	Caricaceae
Genus	<i>Carica</i>

## 2. Parts of carica papaya –

The whole carica papaya has unique medicinal use. Every part of carica papaya can be used to cure disease. Carica papaya is dividing into leaves, fruit, seeds, peel, roots, latex.

### 2.a. Leaves

Papaya leaves have many benefits. It can be used to treat many fatal diseases. In some parts of Asia, papaya leaves are steamed and eaten like spinach. Carica papaya leaves can be used therapeutically.



Fig. - Leaves

### **-Dengue Fever**

The juice from carica papaya leaves helps increase white blood cell and platelet counts, normalizes blood clotting and also helps repair the liver. Papaya juice extract is administered to dengue patients within 24 hours, and the platelet and white blood cell counts rise to normal levels. The secondary metabolites of this plant form huge storage compounds.

Begins with the research of Dr. Sanath Hettige, who conducted a study of 70 dengue patients, said papaya leaf juice helped increase white blood cells and platelets, normalize blood clotting, and repair the liver.

### **-Cancer Cell Growth Inhibition**

Carica papaya leaf extract has been shown to inhibit the growth of cancer cells. It promotes the production of important signaling molecules called Th1-type cytokines. These cytokines help regulate the immune system. Other benefits of papaya leaves are:

- It can act as an acne medicine
- It increases appetite in patients with low appetite
- It helps to ease menstrual pain.
- It can help to relieve nausea.

### **-Facilitate Digestion**

The leaves of the papaya plants contain Chemical compounds of karpain, Substance which Kills microorganisms that often interfere with the Digestive function.

### 2.b. Fruit -

Papaya fruit is a rich source of nutrients such as provitamin A carotenoids, vitamin C, vitamin B, lycopene, dietary minerals, and fiber. Danilone is a phytoalexin found in papaya fruit. The compound showed potent antifungal activity against *Colletotrichum gloeosporioides*, the pathogen of papaya.



Fig. Fruit

The fruit can be used as:

- Laxative
- As cure for indigestion
- Helps to prevent heart attack and stroke

Fresh ripe papaya should be taken every morning to prevent Indigestion, constipation and it also helps to improve appetite. The fruit of carica papaya can be used to treat mouth ulcer, gum disease and toothache.

### 2.c. Seed-

Carica papaya seeds are black. It has a very hot and spicy taste. It can also be used as a substitute for black pepper. Papaya seeds are very spicy and have more medicinal properties. Compared to other parts of the tree, papaya seeds have antibacterial properties and are very effective against staphylococcal infections. The seeds are protected from toxins. It helps protect the kidneys and prevent kidney failure. Helps recover from hemorrhoids and typhoid fever. Dried papaya seeds are highly nutritious. Grinding this seed and adding it to your diet will add enzymes to your diet and help improve digestive problems.

### 2.d. Roots –

Papaya root juice is used in some Asian countries to relieve urination problems. Papaya leaves, when dried and cured like cigars, are smoked by asthmatics. A decoction of fresh papaya leaves is used to ward off or destroy worms in the intestine. Fresh young Papaya is also used to relieve colic, certain stomach ailments and cramps.

The juice from the root is used in some Asian countries to relieve urinary problems. A decoction made by boiling papaya root can be used to cure indigestion

### 2.e. Peel:



Papaya peel is often used in cosmetics and can also be used as a home remedy. Papaya peel acts as a sunscreen and soothing agent, helps fight dandruff, and can also be used as a muscle relaxant.

## 3. Nutritional value of 100 g of papaya fruit-

Components of ripe papaya include energy (163 KJ), protein (0.6 g), fat (0.1 g), minerals (0.5 g), fiber (0.8 g), carbohydrates (7.2 g), beta-carotene (888 µm) It is included. , total carotene (2,740 µm), sodium (3 mg), iron (0.10 g), vitamin A (1,094 IU), vitamin E (0.73 mg), niacin (3 mg), water (89%). These papaya nutritional values help prevent oxidation of cholesterol. Papayas are rich in iron and calcium. A good source of vitamins A, B and G and a good source of vitamin C (ascorbic acid). C. Papaya extracts and juices contain alkaloids, glycosides, flavonoids, carbohydrates, saponins, terpenoids, steroids and tannins.

**Table 2: Papaya, raw Nutritional value per 100 g**

Energy	163KJ
--------	-------

Sodium	3 mg
Potassium	257
Phosphorus	5
Magnesium	10
Iron	0.10
Calcium	24
Vitamin C	61.8
Folate (vit. B9)	38
Vitamin B6	0.1
Niacin (vit. B3)	0.338
Riboflavin (vit. B2)	0.05
Thiamine (vit. B1) 0.04 mg	0.04
Vitamin A	328
Protein	0.61
Fat	0.14
Dietary fibre	1.8
Sugars	5.9
Carbohydrates	9.81

**Table 3 - Carica papaya is a pack of enzymes**

<i>Phytoconstituents</i>	<i>Carica papaya part</i>
Enzyme Papain, chymopapain	Unripe fruit
Carotenoids B carotene, cryptoxanthin	Fruits
Carposide	Roots
Glucosinolates Benzyl isothiocyanate, papaya oil	Seeds
Minerals Ca, K, Mg, Zn, Mn, Fe	Shoots, leaves
Monoterpenoids Linalool, 4-terpinol	Fruits
Flavonoids Myricetin, kaempferol	Shoots
Alkaloids Carpaine, carpaine, vitamin C and E	Leaves

These papaya nutritional values help prevent oxidation of cholesterol. Papayas are rich in iron and calcium. It is a good source of vitamins A, B and C and is a good source of vitamin C (ascorbic acid). Unripe C. papaya extract contains terpenoids, alkaloids, flavonoids, carbohydrates, glycosides, saponins, contains steroids.

#### **4. Parts and medicinal uses of C. papaya-**

C. Papaya is a pack of enzymes. Immature fruits (papain, chymopapain), fruits ( $\beta$ -carotene, carotenoids, cryptoxanthin, monoterpenoids, linalool), roots (carposides), seeds (papaya oil, glucosinolates, benzylisothiosinolate), leaves (Zn, Mn), Fe, K, minerals), sprouts (flavonoids, kaempferol, myricetin, minerals, Ca, Mg, Fe) and leaves (vitamins C and E, alkaloids, carpaine).

**Cancer-** Papaya can suppress the growth of cancer cells. Fiber released from the fruit binds to cancer-causing cells and keeps cancer cells away from healthy cells. Papaya nutrients provide synergistic cell protection free from free radical damage. To do. Men who consume lycopene-rich fruits such as carica papaya, tomatoes, and guava are less likely to get prostate cancer than those who do not consume these foods.

**Wound Healing:** Papaya latex has been shown to aid wound healing. Papaya latex was poured onto the affected area of the wound. Papain and chymopapain are known to be highly effective in wound healing. Papain and chymopapain are known to be highly effective in wound healing.

**Anti-Inflammatory effect-** Carica papaya contains protein enzymes and antioxidants such as papain and chymopapain. Vitamin E and beta-carotene help reduce severe inflammatory reactions such as osteoarthritis and asthma.

---

## 5. Pharmacological properties of *C. papaya*

The plant *C. papaya* has antioxidant, antihypertensive, wound healing, hepatoprotective, anti-inflammatory, antibacterial, antifungal, antifertility, histaminergic, diuretic, antiamoebic, antitumor, anthelmintic, smooth muscle, antimalarial, and hypoglycemic properties. It has been proven to have various medicinal properties such as , immunomodulatory activity, anti-ulcer activity, anti-sickling activity.

### 5. a. Antimicrobial activity-

Aqueous extracts of papaya leaves and roots at different concentrations (25, 50, 100, 200 mg/ml) showed antibacterial activity against several human pathogenic bacteria using the agar diffusion method.

### 5. b. Antifungal activity-

*C. papaya* and fluconazole latex have a synergistic effect in inhibiting the growth of *Candida albicans*. This synergistic effect results in partial degradation of the cell wall. Latex proteins are believed to be responsible for the antifungal effect and the minimum protein concentration that produces complete inhibition has been reported to be approximately 138 mg/mL.

### 5.c. Anti-fertility activity

A crude extract from *C. papaya* bark [5-10 ml/(kg.d), 4 weeks in the seminiferous tubules of p.o. rats] showed complete loss of fertility. This is due to decreased sperm motility and altered morphology. Therefore, bark has proven to be safe and may serve as an effective male contraceptive in animals.

### 5. d. Diuretic activity

Oral administration of *C. papaya* water root extract to rats at a dose of 10 mg/kg significantly increased urinary excretion, showing a similar urinary electrolyte excretion profile to hydrochlorothiazide.

### 5.e. Anti-hypertensive activity-

Ethanol extract from ripe fruits of *C. papaya* was used for antihypertensive effect. Basal mean arterial pressure (MAP) was  $(93.8 \pm 4.5)$ ,  $(175.2 \pm 5.1)$ ,  $(181.3 \pm 6.2)$  mmHg in normotensive, renal, and DOCA saline hypertensive subjects. Both hydralazine (200  $\mu$ l/100 g, IV) and ethanolic extract from unripe fruits of *C. papaya* (20 mg/kg, IV) reduced normotensive, renal, and DOCA salt levels compared to control animal groups. It significantly decreased MAP in hypertension. However, the extract caused about 28% more depression from MAP than hydralazine in the hypertensive group.

### 5.f. Anthelmintic-

Dried papaya seeds given as an elixir with honey have shown significant efficacy against intestinal parasites in humans without significant side effects. The benzyl isothiocyanate contained in the seeds is the main anthelmintic. Papaya latex has anthelmintic activity against *Heligmosomoides polygyrus* in experimentally infected mice, suggesting a potential role as an anthelmintic agent against potent intestinal nematodes in mammalian hosts. Effective at a dose of 8 g/kg body weight.

### 5.g. Anti-malarial activity-

Petroleum ether extracted from raw papaya fruit peel at 0.05 to 1,000  $\mu$ g/ml. The extract showed significant antimalarial activity.

### 5.h. Anti-ulcer activity-

Aqueous seed extract of *C. papaya* at doses of 50 mg/kg and 100 mg/kg p.o. against alcohol-induced acute gastric injury and blood oxidative stress in rats. Gastric acid was significantly reduced in rats treated with 100 mg/kg extract.

---

## 6. Papaya in case of pregnancy-

The main components of papaya are papain and chymopapain, which are found in latex and exhibit teratogenic and screening (potentially miscarriage-inducing) effects. This may increase the chances of uterine contractions, as papain acts like prostaglandin and oxytocin. Latex can also cause placental edema and bleeding, which can be serious during pregnancy. It can lead to complications and usually premature birth.

## 7. Cosmetic Benefits of Papaya-

By rubbing the white flesh of fresh papaya, acne and wrinkles are also improved. Papaya acts as a good bleaching agent. It is an important ingredient in bath soaps, astringents, detergents and hand washing products. Papaya Skin Lightening Recipe Experts suggest that papaya can help remove dead, worn-out skin cells and replace them with healthy new cells, thereby brightening the complexion. To do this, prepare a paste of raw papaya and apply it to your skin for several days.

## 8. Conclusion –

The whole plant has its own medicinal properties. The various vitamins and enzymes contained in the plant (*C. papaya*) make it a dietary supplement. Papaya has a wide range of pharmacological properties. According to traditional claims, papaya is a powerful medicine. The wide range of enzymes and vitamins found in *Carica papaya* make it a dietary supplement. The latex obtained from the *Carica papaya* fruit can be used to heal wounds such as burns. This overview covers all pharmacological activities and uses of chemical ingredients.

## 9. Reference –

- 1) Roshan A, Verma NK, Gupta A (2014) A Brief Study on *Carica Papaya*- A Review. *International Journal of current Trends in Pharmaceutical Research* 2(4): 541-550.
- 2) Journal of Medicinal Uses of *Carica Papaya*, Traditional And Medicinal Uses Of *Carica Papaya*, Aravind.G, Debjit Bhowmil, Durai vel.S, Harish.G.
- 3) *Papaya (Carica Papaya L.) Biology and biotechnology*: Jaime A. Teixeira da Silva, Zinia rashid, Duong Tan Nhut, Dharini Sivakumar, Abed Gera, Manoel Teixeira Souza Jr and Paula F. Tennat.
- 4) Dengue Fever treatment with *Carica papaya* leaves extract. Nisar Ahmad, Hina Faizal, Muhammmad ayaz, Bilal Haider Abbasi, Ijaz Mohammad, Lubna fazal
- 5) The Efficacy of *Carica Papaya* Leaf extract on some bacterial and A fungal strain by well diffusion method. C. Baskaran, V. Ratha Bai, S. Velu, Kubendiran kumaran
- 6) Eno AE, Owo OI, Itam EH, Konya RS. Blood pressure depression by the fruit juice of *Carica papaya* (L.) in renal and DOCA-induced hypertension in the rat. *Phytother Res* 2000; 14(4): 235-239.
- 7) Nayak BS, Pinto Pereira L, Maharh D. Wound healing activity of *Carica papaya* L. in experimentally induced diabetic rats. *Indian J Exp Biol* 2007; 45(8): 739-743.
- 8) Sadeque MZ, Begum ZA. Protective effect of dried fruits of *Carica papaya* on hepatotoxicity in rats. *Bangladesh J Pharmacol* 2010; 5(1): 48-50.
- 9) Owoyele BV, Adebukola OM, Fummilayo AA, Soladoye AO. Anti-inflammatory activities of ethanolic extract of *Carica Papaya* leaves. *Inflammopharmacology* 2008; 16(4): 168-173.
- 10) Anibijuwon II, Udeze AO. Antimicrobial activity of *Carica Papaya* (pawpaw leaf) on some pathogenic organisms of clinical origin from South-Western Nigeria. *Ethnobotanical Leaflets* 2009; 13: 850-864.
- 10) Giordani R, Siepaio M, Moulin-Traffort J, Regli P. Antifungal Action of *Carica papaya* latex, isolation of fungal cell wall Hydrolyzing enzymes. *Mycoses* 1991; 34(11-12): 469-477.
- 11) Kusemiju O, Noronha C, Okanlawon A. The effect of crude extract of the bark of *Carica papaya* on the seminiferous tubules of the male Sprague-Dawley rats. *Niger Postgrad Med J* 2002; 9(4): 205-209.
- 12) Adebisi A, Adaike PG, Prasad RN. Histaminergic effect Of crude papaya latex on isolated guinea pig ileal strips. *Phytomedicine* 2004; 11(1): 65-70.
- 13) Sripanidkulchai B, Wongpanich V, Laupattarakasem P, Suwansaksri J, Jirakulsomchok D. Diuretic effects of selected thia indigenous medicinal plants in rats. *J Ethnopharmacol* 2001; 75(2-3): 185-190.
- 14) Tona L, Kambu K, Ngimbi N, Cimanga K, Vlietinck AJ. Antiamoebic and phytochemical screening of some Congolese medicinal plants. *J Ethnopharmacol* 1998; 61(1): 57-65.

- 
- 15) Otsuki N, Dang NH, Kumagai E, Kondo A, Iwata S, Morimoto C. Aqueous extract of *Carica papaya* leaves exhibits anti-tumor And immunomodulatory effects. *J Ethnopharmacol* 2010; 127(3): 760-767.
  - 16) Kermanshai R, McCarry BE, Rosenfeld J, Summers PS, weretilnyk EA, Sorger GJ. Benzyl isothiocynate is the chief or sole anthelmintic in papaya seed extracts. *Phytochemistry* 2001; 57(3): 427-435.
  - 17) Panse TB, Paranjpe AS. Carpasemine isolated from *Carica Papaya* seeds. *Proc Indian Acad Sci* 1943; 18: 140.
  - 18) Krishnakumari MK, Majumder Sk. Studies on anthelmintic activities of seeds of *Carica papaya* Linn. *Ann Biochem Exp Med* 1960; 20(1): 551-556.
  - 19) *Papaya(Carica Papaya L.) Biology and Biotechnology*:Jaime A.Teixeira da Silva,Zinia Rashid,Duong Tan Nhut,Dharini Sivakumar,Abd Gera,Manoel Teixeira Souza Jr and Paula F.Tennat.
  - 20) Dengue Fever treatment with carica papaya leaves extract.Nisar Ahmad,Hina Faizal,Muhanmmad ayaz,Bilal Haider Abbasi,Ijaz Mohammad,Lubna fazal
  - 21) Wound healing properties of carica papaya latex.Shila Gurung,Natasa Skalko-Basnet
  - 22) <https://doi.org/10.1155/2021/5511221>