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## Medicative Properties of *Carica papaya* – An Overview



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### ABSTRACT

Medicinal plants play very important role in indigenous medical system. The ethnobotanical gardens serve as a rich source for natural drug research and development. *Carica papaya*, commonly known as Papaya, Paw-paw or Papita is a nutraceutical fruit. Not only fruit, different parts of papaya plant including leaf, flower, bark, seed, have prophylactic properties. Due to the presence of bioactive constituents, these show medicative qualities. Present review illustrates the various activities of different parts of papaya plant such as anticancer, Platelet enhancer, Antimalarial, immunomodulatory, anti-inflammatory, antihelminthic, anti-diabetic, antibacterial and antifertility effects.



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## INTRODUCTION

From a very long time, plants have been used as remedy for treatment of various diseases because of natural production and lesser side effects [1]. Indian medicinal plants are universally famous for their medicinal properties. Rural people depend on herbal and traditional medicines to cure their diseases as medicinal plants are easily available in their surroundings environment and have low cost with increased efficacy and reliability [2].

Medicinal herbs are a source of chemical compounds such as alkaloids, glycosides, saponin, oleoresins, sesquiterpine, lactones and oils [3]. These biologically active ingredients are used for the prophylactic purposes and for the different infectious diseases [4]. Due to the presence of medicative properties, medicinal plants have been used in wide area of world. Many diseases like malaria, epilepsy, diarrhea, dysentery, fungal and bacterial infections have been treated by folklore medicines [5]. Saleh studied that the parts and by-products of plants have been known to be useful for pharmaceutical derivative without any adverse effect and they are big storage of herbal medicines since human history [6]. Identification and extraction of phytomedicines from millions varieties of folklore plants and their effective role in treating diabetes, arthritis, infectious diseases etc. still remains a mystery [7].

*Carica papaya* Linn. has abundant medicinal properties. It belongs to the family *Caricaceae*. and is commonly called Paw-paw and papaya or Papita in Hindi. Papaya plant is perennial, herbaceous, succulent with self-supporting stem having 20-30ft. height. [8]. The leaves of this plant are very large palmately lobed on long petioles and with 5-7 lobes. It has rapid growth rate and it can produce fruits for more than 15-20 years. Papaya plants are male, hermaphrodite or female [9]. *Caricaceae family* grown in Australia, Hawaii, Philippines, Sri Lanka, South Africa, India, Bangladesh, Malaysia, and other countries in tropical America [10]. Major producers of papaya are Brazil, India, Mexico, and United States. Hawaii is the primary producer of papaya [11].

Papaya is a rich source of nutrients. Different parts of *Carica papaya* including leaves, seeds, flowers, root, bark, fruit etc. used to obtain bioactive constituents for the cure of different maladies [12]. Papaya also contains various minerals like potassium, magnesium, vitamins such as A, C, E and vitamin B, Pantothenic acid, folate and fibers [13].

**Objective-**This review paper focuses on the medicative properties of Papaya. Objective of this review paper to aware the medicative properties of papaya plants and their parts.



**Image 1: *Carica papaya* plant.**

**Botanical classification:**

Botanical Name – *Carica papaya*

Domain – Flowering plant

Kingdom- Plantae

Class- Magnoliopsida

Superdivision – Spermatophyta

Phylum- Streptophyta

Order- Brassicales

Family- Caricaceae

Genus- *Carica*,



**Medicative Properties:**

*Carica papaya* Linn. is one of the valuable medicinal plants. The different parts of the *Carica papaya* proved to have medicinal value.

**Leaf:** Papaya leaf has potential medicinal properties:

**[a] Platelet enhancer-** The steamed young leaf of papaya eaten like green leafy vegetable. Studies on dengue patient show that papaya leaf extract increases white blood cells and platelet in blood and repair liver.

The juice of *Carica papaya* enhances the platelet number which is lowered in dengue fever and dengue hemorrhagic fever [14]. Kala C.P. reported that suspension of powdered papaya leaves with palm oil is used by dengue patients, the platelet number increased well within 24 hours of consumption of papaya leaf extract. Nowadays papaya leaves have been most applied in folklore medicine for the treatment of dengue [15].

**[b] Cancer inhibitor-** Experimentally it has been observed that papaya leaf extract has cancer cell growth inhibitor quality. It enhances the formation of Th1-type cytokines, which helps in regulating the immune system. Aqueous extract of papaya leaves, shows anticancer activity and inhibition properties to cancer cell growth [16]. Extract of *Carica papaya* has been used as a remedy for different infectious diseases and cancer. Ngyuen TT have been demonstrating *in-vitro* activity on cell lines. It demonstrated that the inhibitory activity against proliferation of cells such as solid and hematopoietic tumor cell lines which derived from cervical carcinoma breast adenocarcinoma (MCF-7) [17].

**[c] Antimalarial and Antiplasmodial** – Papaya leaves are taken into tea as remedy for malaria. It is believed that Papaya leaves have antimalarial and antiplasmodium activity, but scientifically explanation is lacking.

**[d] Digestion Facilitator** – Papaya leaf contains specific chemical compound campaign. Papaya leaf shows additional benefits such as- it increases the appetite, it eases the menstrual pain, acts as an acne medicine, it is a meat tenderizer, it relieves nausea [18]. The *Carica papaya* leaves have properties of antioxidants and has free radical scavenging potential. [19].

**[e] *Carica papaya* leaf is storage of mineral elements.** Due to presence of minerals like Ca, Mg, Na, K, Fe, Mn papaya leaves are useful in the nervous system, circulatory system, coagulation of blood, normal contraction of muscles. The presence of Mg signifies that leaf is helpful to cure tuberculosis, diabetes, cancer, tetanus and all nervous diseases. Na assists in metabolism, osmosis, assimilation, digestion and cleansing the digestive system. The

presence of Iron indicates that the leaves can be used for curing anemia, tuberculosis, growth disorders [20].

Atta reported that fresh green papaya leaf acts as antiseptic while brown dried papaya leaf is used as tonic and blood purifier. The yellow leaf is generally used as anti-anemic agent [21].

**[f] Anti-inflammatory activity-** In literature it has been reported that dried powder of papaya leaves is used as remedy for treatment of pyrexia, diabetes, fever, gonorrhoea, syphilis, inflammation, arthritis and rheumatism. Biological activity of plant is carried out by bioactive agents such as carpain, nicotinic acid which is present in *Carica papaya* leaves [22].

**[g] Anthelmintic activity-** Anthelmintic activity of papaya leaf has been reported in literature. This anthelmintic property of papaya may be due to the presence of Proteolytic enzyme like papain, chymopapain and lysozyme [23].

**[h] Antibacterial activity-** It has been found that the leaf extract of Papaya contains antibacterial activity against gram negative and gram positive bacteria. It is reported that it protects against *Salmonella typhi*, *paratyphi*, *Typhimurium* [24].

**[i] Antidiabetic effect-** Studies show that aqueous extract of *Carica papaya* leaves exhibits hypoglycemic and antioxidant effect, it also improves lipid level in rats [25]. Aqueous extract of *Carica papaya* leaves controls plasma glucose level and serum lipid in diabetic rats [26].

**Peel:** Peel of papaya fruit has many benefits as leaf of *Carica papaya* and it is often used in cosmetics. Papaya peel works as muscle relaxant, sunscreen, soothing slave and also fights against dandruff.

**Root:** Papaya root juice is helpful to ease urinary trouble and in decoction form it is taken to cure dyspepsia [18]. Root juice also gives relief in bronchitis, cough and other respiratory ailments.

**Seed:** Papaya has black wrinkled seeds. Seeds are edible and have sharp spicy taste. These have same properties as black pepper and are used as a substitute. Due to pungent, peppery quality it becomes unpalatable. It seems that seeds have potential medicinal properties than the flesh. Study of literature shows that papaya seeds show antibacterial activity against *E. coli*, *Salmonella*, *Staphylococcus*. Papaya seeds may prevent kidney from failure, intestine from parasite and also help in detoxification of liver. Seeds have anthelmintic and anti-

amoebic properties and used to cure piles and typhoid [18]. Consumption of papaya seeds is cheap, natural, harmless, as these are readily available, mono-therapeutic and prevent against intestinal parasitosis especially in tropical communities. Air dried papaya seeds are mixed with honey and this mixture kills human intestinal parasite without any adverse effect [27].

**Fruit:** Papaya is considered as a nutraceutical fruit due to its multifaceted medicinal properties. The papaya fruits are big, oval in shape with green-yellow skin and yellow-orange flesh. Central cavity is embedded with black seeds. In unripe papaya fruit peroxidase enzyme is present in large quantity but on ripening it becomes low. Unripe fruit acts as remedy for ulcer and impotence [28]. It has low calories and high natural vitamins and minerals. Papaya fruit is rich of vitamin C, vitamin A, riboflavin, folate, calcium, thiamine, iron, niacin, potassium and fibers. Due to low calories, obese people eat it for reducing weight. Papaya is good supplier of vitamin A and C, which are essential for good health especially for vision and also help to prevent from early age blindness. Papaya fruit is widely appreciated for its nutritional value, flavor, digestive properties and serotonin content [29]. Normal eating of ripened papaya by pregnant lady may not be harmful however unripened papaya could be harmful on consumption during pregnancy [30].

## CONCLUSION

Papaya (*Carica papaya* Linn.) is commonly known for its food and nutritional values throughout the world. Papaya possesses excellent medicinal properties for treatment of different ailments. The various parts of the *Carica papaya* plant which include leaves, seed, bark, fruit, peel of papaya fruit exhibited medicinal properties. *Carica papaya* is rich source of antioxidants, flavonoids, alkaloids, tannin, vitamins and polyphenols. By regular consumption, it may be boon for human ailments and specially for eye sight. Study of various phytochemicals of *Carica papaya* will be helpful for pharmaceutical industries.

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