



## **Study on Papaya (Carica Papaya) Activity on Dengue**

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### **ABSTRACT**

Papaya (*Carica papaya* Linn) is commonly called as paw-paw and it belongs to the family Caricaceae. Papaya is commonly known for its food and nutritional values throughout the world. The properties of Papaya fruit and other parts of the plant are also well known in traditional system of medicine. During the Last few decades considerable progress has been achieved regarding the biological activity and medicinal Application of papaya and now it is considered as valuable nutraceutical fruit plant. Papaya possess excellent medicinal properties for different ailments. The different parts of the *Carica Papaya* plant including leaves, seeds, latex and fruit exhibited to have medicinal value. The stem, leaf and fruit of papaya contain plenty of latex. The potential therapeutic effect of *Carica papaya* leaf juice has attracted wide interest from the public and scientists in relieving dengue related manifestations. Currently, there is a lack of evaluated evidence on its juice form. Therefore, this scoping review aims to critically appraise the available scientific evidence related to the efficacy of *C. papaya* leaf juice in dengue.

**Keywords** – papaya , *Carica papaya*, Dengue, Latex

### **1. Introduction**



**Fig: Carica papaya**

*Carica papaya* Linn belonging to family Caricaceae is commonly known as papaya in English, Papita in Hindi and Erandakarkati in Sanskrit. The plant is native to tropical America and was introduced to India in 16<sup>th</sup> century. The plant is recognised by its weak and usually unbranched soft stem yielding copious white latex and crowded by a terminal cluster Of large and long stalked leaves, is rapidly growing and can grow up to 20m tall. Traditionally leaves have been used for treatment of a wide range of ailments, like in treatment of malaria, dengue, jaundice, immunomodulatory and antiviral activity. Young Leaves are rich in flavonoids (kaempferol and myricetin), alkaloids (carpaine, Pseudocarpaine, dehydrocarpaine I and II), phenolic compounds (ferulic acid, caffeic acid, Chlorogenic acid), the cynogenetic compounds (benzylglucosinolate) found in leaves. Leaves being an important part of several traditional formulations are undertaken for standardization for various parameters like moisture content, extractive values, ash values, swelling index, etc[1]

### **2. Taxonomical morphology and distribution**

#### **2.1 Botanical Classification**

Domain: Flowering plant

Kingdom: Plantae

Sub Kingdom: Tracheobionta

Class: Magnoliopsida

Subclass: Dilleniidae

Superdivision: Spermatophyta

Phylum: Steptophyta

Order: Brassicales

Family: Caricaceae

Genus: Carica

Botanical Name: Carica papaya Linn[1]

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### 3. Mechanism of action of papaya on Dengue

The papaya plant possibly brings about its effect in dengue by treating thrombocytopenia associated with the condition. A study has reported membrane stabilizing properties of *C. papaya* L. leaf extracts in in vitro studies. The study found that *C. papaya* L. leaf extracts inhibited heat-induced and Hypotonicity-induced hemolysis of erythrocytes obtained From both healthy individuals and individuals with dengue Infection; the effect was observed at the lower concentrations Of the extracts. Thus, the extracts are likely to possess Membrane-stabilizing properties and protect blood cells against Stress-induced destruction. This property may be useful in Patients with dengue infection where the leaf extracts could Possibly prevent platelet lysis. The authors postulate that this Effect could be due to the presence of flavonoids and other Phenolic compounds in the papaya leaves.[2]

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### 4. Uses



**Fig : Carica papaya plant**

The papaya plant or *C. papaya* has been used since ancient times for the treatment of a number of disease conditions. Various beneficial effects of extracts from the leaves, fruit and seeds have been suggested through scientific studies. The chymopapain and papain extracts of the leaves are useful in the treatment of digestive disorders. The extracts from fruits and seeds have bactericidal properties. The fruit juice and leaf extract have been demonstrated to have a wide variety of properties including anticancer, antioxidative, anti-inflammatory, anti-bacterial, nephroprotective, hepatoprotective, hypoglycemic and hypolipidemic effects, and anti-sickling effect in sickle cell disease. [2]

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## 5. Medicinal properties of various parts of plant *Carica papaya*

### 5.1) *Leaves*

Papaya leaf has a numberless of benefits. In some parts of Asia, the young leaves of the papaya are steamed and eaten Like spinach.

- a) Dengue fever- papaya leaf juice helps increase white blood Cells and platelets, normalizes clotting, and repairs the Liver.
- b) Cancer cell growth inhibition- Leaf tea extract has demonstrated cancer cell growth Inhibition. It appears to boost the production of key [1]

### 5.2) *Fruit*

Papaya fruit is a rich source of nutrients such as provitamin A, Carotenoids, vitamin C, vitamin B, lycopene, dietary minerals And dietary fibre. Danielone is a phytoalexin found in the Papaya fruit. This compound showed high antifungal activity Against *Colletotrichum gloeosporioides*, a pathogenic fungus of Papaya.

- a) Laxative- Ripe papaya fruit is laxative which assures of Regular bowel movement.
- b) Indigestion- The milky juice which is tapped from the Green, mature fruit while still in the tree contains an Enzyme known as “papain”. People use this in the Preparation of different remedies for indigestion.[1]

### 5.3) *Seeds*

Papaya seeds have antibacterial properties and are effective Against *E. coli*, *Salmonella* and *Staphylococcus* infections Papaya seeds may protect the kidneys from toxin – induced Kidney failure. Seeds can eliminate intestinal parasites, and Help detoxify the liver. Used as a skin irritant to lower fever. Cure for piles and typhoid and anti-helminthic and anti-Amoebic properties. [1]

### 5.4) *Peel*

Papaya peel is often used in cosmetics. The papaya peel can Also be used in many home remedies.

- a) Sunscreen and soothing slave- The presence of vitamin A Helps to restore and rebuild damaged skin. Applied papaya Peel used as skin lightening agent. When peel mixed with Honey and applied it can act as soothe and moisturizers the Skin.
- b) Fight dandruff- The papaya vinegar with lemon juice can Be applied to the scalp for 20 minutes prior to shampooing To fight dandruff.[1]

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## 6. Dengue Virus

Dengue is an endemic disease. Dengue fever is A borne tropical caused by the dengue virus. It has Affected the normal life of people living tropical and Subtropical regions. Dengue is the most common human Arthropod-borne virus disease and it causes thousands Of deaths every year. Symptoms typically begin Three to fourteen days after infection. This may include A high fever, headache, vomiting, muscle and joint Pains, and a characteristic skin rash. Recovery generally Takes two to seven days. In a small proportion of cases, The disease develops into the life-threatening dengue Hemorrhagic fever, resulting in bleeding, low levels of Blood platelets and blood plasma leakage, or into Dengue shock syndrome, where dangerously low blood Pressure occurs. [3]

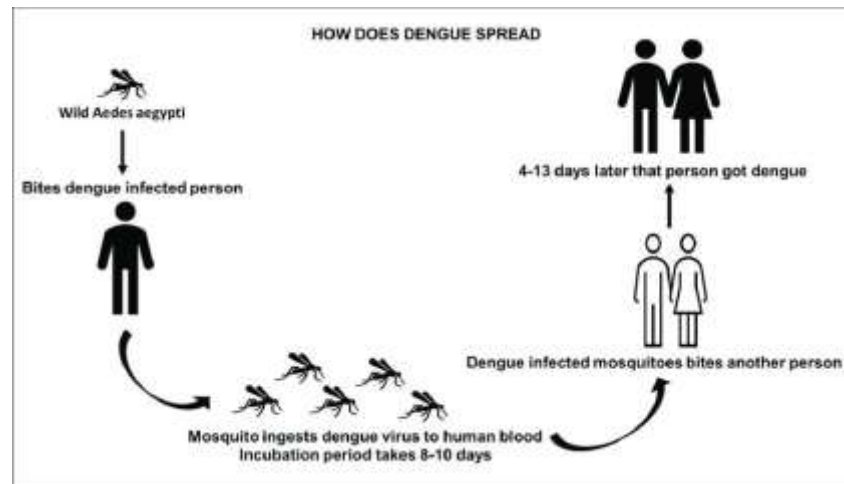


Fig: schematic diagram of Dengue virus

## 7. Role of papaya leaf extract in Dengue virus

Thrombocytopenia occurs if platelet count decrease and it may cause plasma leakage in dengue Patients. Megakaryocyte is responsible for the Production of blood platelets, and ALOX 12 genes are Strongly expressed in megakaryocytic. ALOX 12, Which is also known as platelet activating factor Receptor (PTAFR), plays an important role in platelet Aggregation. It means that PTAFR gene can be a Precursor for platelet production. Carica papaya leaf Extract increases the activity of ALOX 12 gene. [3]

## Discussion

The Carica papaya and activity of plant on dengue virus was discussed. The uses of various plant was discussed. The plant showing action on dengue virus is been discussed above.

## Conclusion

The Carica Papaya plant uses were investigated in this work. The uses and mechanism of action of papaya plant and the effect of plant on dengue virus is been studied.

## Author contribution

Both the author involve equally in collection a information and designing of manuscript.

## Disclosure of interest

The author declare that they have no conflict of interest concerning the article

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