



# THE POTENTIAL OF PAPAYA LEAVES IN DENGUE TREATMENT

*Based on Patient Intervention*

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## Abstract

Dengue fever is a viral illness that is spread through infected mosquitoes. It affects millions of people each year and is caused by four different serotypes of the dengue virus (DEN-1,-2,-3,-4), which are transmitted through the bite of infected *Aedes* mosquitoes.

The disease is prevalent in tropical and subtropical regions around the world, with an estimated 390 million infections per year. The signs and symptoms of dengue fever can be mild or severe, and they usually develop within a week of being bitten by an infected mosquito. Some common symptoms of dengue fever include high fever, severe headache, muscle and joint pain, swollen lymph nodes, and a rash on the skin.

The dengue virus is transmitted by mosquitoes that are infected with the virus. These mosquitoes usually breed in stagnant water, such as in buckets, flower pots, discarded tires etc. When a mosquito bites a person who is infected with dengue fever, they become infected with the virus as well. The mosquito can then spread the virus to other people by biting them. This is why dengue fever is most common in areas where mosquitoes are prevalent.

There is currently no cure for dengue fever, but there are treatments available that can help to relieve the symptoms. These treatments include rest, drinking plenty of fluids, and taking pain relievers such as acetaminophen. In severe cases of dengue fever, hospitalization may be necessary.

Traditional treatments for dengue fever are limited to symptomatic relief while the virus runs its course. However, recent studies have shown promising results in the use of papaya leaves as a natural remedy for dengue fever.

## Preface

Each year, an estimated 390 million dengue infections occur around the world, resulting in up to 36,000 deaths. The need for an effective cure has never been more urgent because The conventional treatment methods for dengue fever, such as painkillers and water intake, are not effective enough. However, the use of papaya leaves as a remedy for dengue has shown promising results in recent years.

Several studies and research have shown that drinking an extract made from papaya leaves can help in the treatment of dengue fever. The traditional treatment for dengue fever involves managing the symptoms while waiting for the virus to clear from the patient's system. Patients are advised to stay hydrated and take acetaminophen to reduce fever and pain, but other anti-inflammatory drugs like aspirin or ibuprofen should be avoided since they can increase bleeding risk.

Papaya leaves contain several bioactive compounds with medicinal qualities that are effective in treating dengue fever symptoms. One of these compounds is papain, an enzyme that can help reduce inflammation in the body. Another compound present in papaya leaves is alkaloids, which offer anti-inflammatory and analgesic properties. The phytochemicals present in papaya leaves can help in the activation of immune system cells in the body, which can help fight dengue fever.

The use of papaya leaves has been shown to have various benefits in the treatment of dengue fever. It can improve the platelet count and reduce bleeding, which are common dengue fever symptoms. Papaya leaf extract stimulates the production of platelets, which can help improve the blood's clotting ability. The leaf extract has also been found to possess antiviral properties, which can suppress the growth of the virus that causes dengue fever.

The reason behind these benefits is the presence of acetogenin in papaya leaves, which helps in preventing diseases like malaria and dengue. Quercetin, kaempferol, and chlorogenic acid are potential antiviral compounds found in papaya leaf extracts. These compounds have inhibitory potential for NS3 and NS5 proteins in DENV2, according to the results of classical docking, MD simulations, ADME, and interaction analysis.

A toxicity study reports that papaya leaves extracts or other preparations are safe for human consumption. Papaya leaf extracts have active components that may help alleviate thrombocytopenia in dengue, along with immunomodulating properties and cytotoxic activities, as reported in several studies. Papaya leaves contain several bioactive compounds such as flavonoids, alkaloids, and phenolic compounds which have been found to exhibit antiviral activity against DEN-1,-2 viruses causing dengue fevers by inhibiting viral replication inside host cells.

A randomized open-label controlled study from Indonesia tested the effect of CP (*Carica papaya*) leaf extract capsule (CPC) in patients with dengue fever. The study revealed that taking papaya leaf extract is considered safe and effective for treating dengue fever. The intervention group received CPC, while the control group received standard care. The period of hospitalization was shorter in the intervention group compared to the control group, suggesting that papaya leaf extract may shorten the duration of hospitalization in patients with dengue fever. Platelet counts rose more rapidly in the intervention group (day 3) compared to the control group (day 5), and platelet counts on day 3 were significantly higher in the intervention group than counts on day 5 in the control group.

The safety profile of consuming papaya leaves has not been studied extensively; however, there are reports of mild gastrointestinal side effects such as nausea, vomiting or diarrhea that may occur due to high doses or prolonged use of fresh raw papaya leaf extract/juice.

Therefore appropriate dosage administration should be considered while using them as an alternative treatment option against dengue fever precautions should be taken when handling raw materials while preparing these remedies since they can cause skin irritation.

One of the most significant advantages of using papaya leaves as a remedy for dengue is that it is easily accessible. The leaves are readily available in most tropical countries, and they are affordable. Preparing the papaya leaf extract is also easy, and it can be prepared at home. Several recipes that involve boiling the leaves and straining the liquid have been identified as the most effective way to gain the required benefits. Papaya leaves have a wide range of potential health benefits and can be used for medicinal purposes.

Proper preparation is necessary to extract the beneficial compounds from the leaves. First, it is important to ensure that the papaya leaves are obtained from a fruit-bearing tree. Then, 50g of the leaves should be weighed and put into a mortar and pestle for pounding. The mixture should be pounded well for 15 minutes until a uniform pulp is formed. Afterward, 50ml of boiled cool water should be added to the mortar and pestle. The pulp should be mixed well and kept for about 30 minutes. The preparation can be stored for 24 hours in the lower compartment of the refrigerator. To extract the papaya leaf extract, the pulp should be squeezed by hand instead of using a cotton sieve. The extract should be filled in glass containers for medicinal use. Additionally, papaya leaves can be extracted in water by boiling them in 2 liters of water until the water is reduced by half. The mixture should be boiled and then simmered for further extraction. After reducing the water by half, the liquid should be strained.

Papaya leaves contain phenolic compounds, papain, and alkaloids which act as strong antioxidants, and may have anti-inflammatory effects, support digestive function, have the potential to lower blood sugar levels, and may even cure digestive disorders.

There is no established dose or frequency for papaya leaf juice consumption as an alternative treatment for dengue fever; therefore it is advised to consult your doctor before using papaya leaf extracts or juices. Still, some studies suggest taking about 30ml of freshly prepared papaya leaf juice two times daily during dengue fever infection under medical supervision.

Proven Case study of a Patient who used Papaya Leaves Extract as a part of their Intervention:

Day	Platelet Count ( $10^3/\mu\text{L}$ )
1	130
3	150
8	357
10	450

The most efficient way to prevent dengue fever is to use mosquito repellent creams. You must use repellents with active ingredients such as DEET up to 30 per cent, picaridin or IR3535. These repellents are made with a delicate formula and are gentle on human skin. Also, these repellents are registered with the Environmental Protection Agency and are proven safe and effective against mosquito bites. However, you must use these repellents only as directed by the medical experts.

Another way to avoid mosquito bites and prevent dengue fever is to use mosquito repellents. This, especially in tropical locations, can help repel mosquitoes from biting you. So, if you live in tropical conditions, or are travelling, you must apply mosquito repellent creams on your body. For children, you can also use mosquito repellent patches, lotions, etc. That are easily available in the market.

## Conclusion

Papaya leaves have proven results that they help increase the platelet count in patients who have been affected by dengue and is recommended by doctors as a course of treatment along with other medications to treat the symptoms for a better result. However it is advisable to consult your physician before using this as a remedy. It is also proven that Papaya Leaves are effective while treating patients with Malaria as well.

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