

The Use of Carica Papaya Extract Against Dengue

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Abstract

Dengue is a mosquito-borne infection and is considered a global pandemic in low-income countries. The papaya leaf extract of *Carica papaya* has therapeutic properties associated with increasing platelet count, inhibiting viral replication, decreasing inflammation, and anticancer aiding in the early recovery of patients. It is also easily accessible and inexpensive in Southeast Asia. No adverse events have been reported, and the medicinal nature of papaya leaf extract makes it an advantageous tool against the Dengue pandemic.

Keywords: Dengue, *Carica papaya* extract, Papaya leaf, Papaya leaf juice, Anti-inflammatory, Anticancer.

Introduction

Dengue is an infection caused by four serotypes, DENV-1 to DENV-4, and is transmitted by mosquitoes 1. The disease is a great burden for developing countries, causing a public health concern because of high mortality rates and economic costs, particularly in Asia and Latin America 1. The virus affects more than half of the world's population and is found in more than a hundred countries 1. Various demographic, social, environmental, and ecological factors contribute to the high incidence of dengue outbreaks 1. The virus is transmitted through the human transmission cycle in urban areas and through animals in forests 2. The main vectors causing human transmission in 128 countries are the mosquitoes *Aedes aegypti* and *Ae. albopictus* 2.

Carica papaya extract is often used as a herbal supplement for people suffering from dengue, contributing to the increase in platelet count by the leaf juice 3. It is considered a flowering plant with fruit found in Mexico, South America, and Southeast Asia 3. The plant contains glycosides, alkaloids, saponins, tannins, and flavonoids, which are responsible for its

decreased duration of illness, hospitalization, and fever. Certain patterns of intake and dosage have contributed to the protective effects of the organs involved in patients infected with dengue 7.

Conclusion

Dengue has become an increasing cause of mortality in low-income countries. Recent findings on the *Carica papaya* extract's effects against dengue, including an increase in platelet functions, protection of the individual's organs, and inhibition of the dengue virus replication, have shown a decrease in the duration of fever and hospital stay when consumed regularly. The easy accessibility and low cost of the extract are advantageous for these countries. Further research studies should explore the favorable effects of papaya leaf extract in the management regimen of dengue patients, focusing on its medicinal and curative properties.

References

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therapeutic properties 3. It has been used for thousands of years for its medicinal mechanisms against bacteria, viruses, tumors, and for lowering glucose levels in the blood 3.

Discussion

The silver nanoparticles derived from the *Carica papaya* leaf extract have anti-dengue properties 4. A study observed this through the analysis of aqueous and nonaqueous materials extracted from the leaf, converting them into silver nanoparticles, and then processing them through Fourier transform infrared spectroscopy and scanning electron microscopy 4. After in vitro interactions between the nanoparticles and viral NS5 protein, dimethoxy-coumarin showed high affinity among other phenolic compounds, such as quercetin, chlorogenic acid, kaempferol, and protocatechuic acid extracted from the papaya leaf 4. These compounds act on the N- and C-terminal domains present on the viral NS-5 protein responsible for catalyzing the methylation of Cap-0 on the 2'-hydroxyl of the ribose, stabilizing the mRNA 4. Through the focus reduction neutralization test, these compounds are able to inhibit viral replication by preventing cap formation 4.

One of the major causes of mortality among dengue patients is a severe decrease in platelet count causing uncontrolled bleeding 5. A systematic review and meta-analysis, conducted on the relationship between platelet count in dengue patients consuming papaya leaf extract, collected studies from India, Malaysia, Pakistan, and Indonesia 5. Out of the nine studies collected, seven showed an increased platelet level with the consumption of the papaya leaf extract 5. No serious adverse events were observed 5. The extract also decreased the number of days an individual was admitted to the hospital and showed an enhancement in the platelet count within the first five days of treatment 5. Although the sole use of papaya leaf extract alone is not enough to confirm the improvement of platelet count, its combined use with other indicators has shown a positive response 5.

The compounds and other components extracted from the papaya leaf extract have an advantage over traditional medicines because of their easy availability, low cost, and no reported adverse events 6. The extract is often rinsed with water, chopped or crushed, and occasionally mixed with sucrose or milk to mask the bitter taste 7. A randomized control trial conducted in 2021 noted that intervention of blended papaya leaf juice and water consumed 20ml twice daily showed a

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