



A novel formulation of PAP-LEF SYRUP (Carica Papaya leaf extract) for an acute viral infection (dengue fever)

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ABSTRACT

Background: Dengue contamination is a viral disease spread by mosquitoes with the quickest spreading in the world. It happens particularly in tropical and sub-tropical nations and *Carica papaya* leaf juice helps increasing the platelet count. **Purpose:** The main purpose of our study is to aware health care professionals about the use of *Carica papaya* leaf extract formulations (SYRUP) to treat a life-threatening disease dengue fever. **Methodology:** A quantity *Carica papaya* leaf was used for the preparation of water extract and given to the 20 dengue patients, 25 ml CP Syrup twice every day for five back-to-back days to treat this disease. **Result:** When the platelets was counted again after taking the *Carica papaya* leaf extract, was increased dengue fever was stable which shows that *Carica papaya* leaf extracts are herbal way of treating dengue fever. **Conclusion:** After conducting the above trial we were able to conclude that *Carica papaya* leaf extract can be used for the treatment of dengue fever which can increase the platelets count in patient suffering from dengue fever, it helps in treating the dengue fever without having any side effects and one of the easy and cheap way to treat the disease.

Key words: Carica papaya, extract, dengue, platelets count, novel formulation

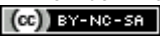
INTRODUCTION

Dengue is a mosquito-borne disease found in tropical and sub-tropical locales around the globe. As of late, transmission has expanded transcendentally in urban and semi-urban regions and has turned into a significant universal general wellbeing concern. Dengue is viewed as a

reappearing malady in the Region because of the way that it isn't yet mapped and known in the influenced Member States [1]. Insufficient epidemiological information are being created so far. Numerous variables are in charge of the ascent in occurrence in the Region. These incorporate statistic changes clarified by phenomenal populace development and spontaneous and uncontrolled

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urbanization[2]. This has prompted improvement of vector reproducing and in this way expanded contact among people and vectors (for example more mosquitoes living nearer to more individuals). Different variables in charge of the development of the sickness incorporates expanded air travel, deficient and crumbling general wellbeing framework and changes in vector dispersion and thickness related with absence of compelling mosquito control [3].

The *Aedes aegypti* mosquito is the essential vector of dengue. The infection is transmitted to people through the nibbles of tainted female mosquitoes [4]. After infection hatching for 4–10 days, a contaminated mosquito is equipped for transmitting the infection for an amazing remainder. Tainted people are the fundamental transporters and multipliers of the infection, filling in as a wellspring of the infection for uninfected mosquitoes. Patients who are as of now contaminated with the dengue infection can transmit the disease (for 4–5 days; greatest 12) by means of *Aedes* mosquitoes after their first side effects appear[5]. The *Aedes aegypti* mosquito lives in urban environments and breeds generally in man-made holders [6]. Not at all like different mosquitoes *Ae. Aegypti* is a daytime feeder; its pinnacle gnawing periods are promptly toward the beginning of the day and in the prior night sunset. Female *Ae. Aegypti* nibbles numerous individuals during each sustaining period. *Aedes albopictus* is an optional dengue vector in Asia[7].

There is no particular treatment for dengue fever. For serious dengue, medicinal consideration by doctors and attendants experienced with the impacts and movement of the malady can spare lives – diminishing death rates from over 20% to under 1%. Support of the patient's body liquid volume is basic to serious dengue care[8]. There is no immunization to secure against dengue. Building up an antibody against dengue/serious dengue has been testing despite the fact that there has been ongoing advancement in immunization improvement.[9]

Carica papaya. (CP) also called the papaya pear were found in most tropical and subtropical nations of the world. Papaya leaves are the leaves which are acquired from the plant *Carica papaya*, sort carica and family Caricaceae request Brassicales. Papaya leaf is wealthy in proteins like papain and chymopapain, which help absorption, avoid swelling and other stomach related issue[10]. 30ml of new papaya leaf juice enables expanding the platelet to check and, in this manner, in the treatment of dengue. It is a little tree, the single stem developing from 5 to 10 m tall. The leaves are enormous, 50–70 cm diameter, deeply palmate

lobed with 7 flaps [11]. The papaya plants is currently developed industrially as an organic product crop in numerous nations of the world. In numerous pieces of Indonesia, the products of papaya are tremendously looked for after by human as important staple and have hostile to hypertension action[12]. A boiling water concentrate of the leaves is taken orally as an antipyretic, and treatment of paleness, hunger incitement.

In different nations the leaves concentrate of CP had been adequately utilized for treatment of dengue fever sickness (DFD)[13]. Papaya leaves are the leaves which are acquired from the plant *Carica papaya*, sort carica and family Caricaceae request Brassicales. Papaya leaf is wealthy in proteins like papain and chymopapain, which help absorption, avoid swelling and other stomach related issue. 30ml of new papaya leaf juice enables expanding the platelet to check and, in this manner, in the treatment of dengue[14]

METHODOLOGY

Extraction of Leaves: Fresh leaves of *Carica papaya* were gathered during July. Crisp leaves (plant verification example number p 06010717) were gathered, washed with water and cleaned with a perfect material to evacuate dust. Leaves were shade dried at room temperature and powdered utilizing a blender processor. 30 g of powdered plant material was separated with 300 ml water in an Ultrasonicator at 37 °C for 2 h. The concentrate along these lines acquired was focused and dissipated to dryness on a water shower keeping up the temperature at 70 °C [15].

Preparation of Syrup Formulation 1: The syrup is prepared in order to mask the bitter taste of the papaya juice. The syrup is consist of papaya leaf extract, honey which is use as a flavoring agent and to also increase the viscosity of the syrup it also mask the unpleasant taste which can be easily taken by the patient. Water is added as a vehicle, and sodium benzoate as a preservative, all the ingredients are added in an ambered glass bottle and agitate thoroughly in order to mix them well. This syrup can be taken by dengue patient who are elder or children who cannot take tablets.

Preparation of Syrup Formulation 2: This syrup consist of papaya leaf extract which is mix with vitamins and selenium, the sugar is added as a flavoring agents and sodium benzoate as a preservative, and then distilled water is added to a final volume. This mixture is now stored in the ambered brown bottle. This syrup is also can be taken by the dengue patient.

Table 1: Ingredients of formulation 1 and formulation 2

SYRUP FORMULATION 1	
INGREDIENTS:	
Papaya leaf extract	
Honey	
Distilled water	
Sodium benzoate	
SYRUP FORMULATION 2	
Papaya leaf extract	
Vitamin B12	
Selenium	
Sodium benzoate	
Distilled water	
Papaya leaf extract	

RESULTS AND DISCUSSION

Assurance of λ max

The focus 125 µg/mL of Carica papaya watery concentrate in 0.1N HCl and phosphate cushion pH 7.4 was seen as 269 nm.

Standard Calibration Curve of Carica papaya:

Aqueous Extract in UV Spectrophotometer: The UV absorbance of Carica papaya watery concentrate standard arrangement in the scope of 30-180 µg/mL in 0.1N HCl and phosphate cushion pH 7.4 demonstrated linearity at λ max 268 nm. The linearity was plotted for absorbance against focus with R2 esteem 0.998 for 0.1N HCl and 0.998 for phosphate cushion pH 7.4.

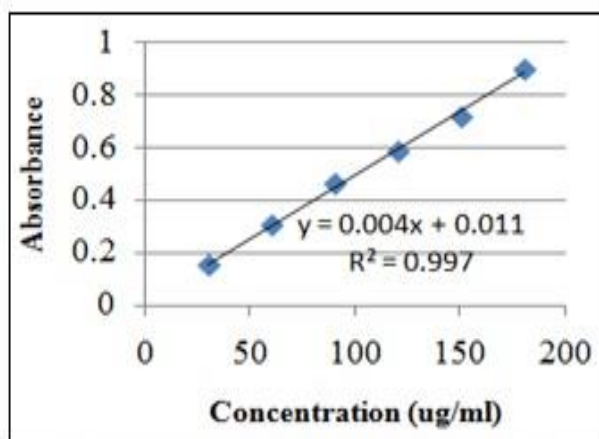


FIG. 1: CALIBRATION CURVE OF CARICA PAPAYA AQUEOUS EXTRACT IN 0.1N HCl

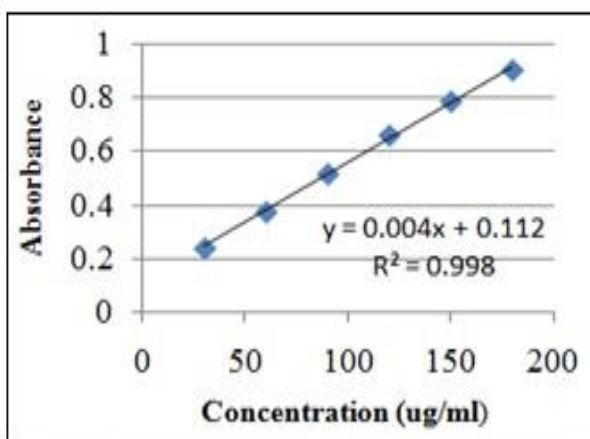


FIG. 2: CALIBRATION CURVE OF CARICA PAPAYA AQUEOUS EXTRACT IN PHOSPHATE BUFFER pH 7.4

Table 2 :Different Test results for PAP-LEAF Syrup Formulation 1

PAP-LEAF SYRUP FORMULATION 1					
S.No	Appearance	Volume Of Syrup (ml)	Of	Viscosity Of Syrup Cps	pH Of Syrup
1	Greenish brown syrup	201		73.5	5.59
2	Greenish brown syrup	200		71.7	5.6
3	Greenish brown syrup	200		72.5	5.58
4	Greenish brown syrup	203		74	5.58
5	Greenish brown syrup	199		72	5.6
6	Greenish brown syrup	200		73	5.6

Table 3 :Different Test results for PAP-LEAF Syrup Formulation 2

PAP-LEAF SYRUP FORMULATION 2					
S.No	Appearance	Volume Of Syrup (ml)	Of	Viscosity Of Syrup Cps	pH Of Syrup
1	Greenish syrup	200		45.5	6.2
2	Greenish syrup	203		46.7	6.7
3	Greenish syrup	198		48.5	6.4
4	Greenish syrup	202		47	6.5
5	Greenish syrup	203		45	6.6
6	Greenish syrup	200		45	5.9

The above prepared dosage form was given to a 20 patients of different age groups and sex who was bitten by carrier mosquitoes. For the treatment of dengue they were given the 350mg tablet TID

(thrice time a day) for five consecutive days. Before the syrup was given the patients' blood sample was analyzed and the data shows in the below table:

Table 4: Results of Neutrophils Count (Neut) (/ml) before the treatment.

PATIENTS NO#	NEUTROPHILS COUNT (NEUT) (/MI)	WBC _s COUNTS (/MI)
1	3.7×10 ³	55×10 ³
2	3.5 x 10 ³	52×10 ³
3	3.3 x 10 ³	56 x10 ³
4	3.2×10 ³	53 x10 ³
5	3.6×10 ³	59×10 ³
6	3.0×10 ³	55×10 ³
7	3.4×10 ³	57×10 ³
8	3.2×10 ³	60×10 ³
9	3.6×10 ³	68×10 ³
10	2.9×10 ³	55×10 ³
11	3.0×10 ³	66×10 ³
12	3.7×10 ³	61×10 ³
13	4.0×10 ³	59×10 ³
14	3.9×10 ³	52×10 ³
15	3.2×10 ³	60×10 ³
16	3.3×10 ³	50×10 ³
17	4.5×10 ³	55×10 ³
18	4.3×10 ³	59×10 ³
19	3.2×10 ³	67×10 ³
20	4.9×10 ³	70×10 ³

Table 5: Results of Neutrophils Count (Neut) (/ml) after the treatment.

PAIENTS NO#	NEUTROPHILS (NEUT) /μL	WBC _s COUNT /μL
1	7.7×10 ³	168×10 ³
2	7.9×10 ³	170×10 ³
3	7.8×10 ³	177×10 ³
4	8.2×10 ³	169×10 ³
5	8.5×10 ³	166×10 ³
6	7.6×10 ³	170×10 ³
7	7.5×10 ³	164×10 ³
8	8.4×10 ³	175×10 ³
9	7.9×10 ³	178×10 ³
10	8.5×10 ³	162×10 ³
11	9.0×10 ³	165×10 ³
12	8.8×10 ³	179×10 ³
13	7.8×10 ³	176×10 ³
14	9.8×10 ³	168×10 ³
15	7.7×10 ³	170×10 ³
16	7.9×10 ³	177×10 ³
17	8.9×10 ³	189×10 ³
18	9.6×10 ³	170×10 ³
19	7.8×10 ³	169×10 ³
20	7.9×10 ³	165×10 ³

After the syrup was given patients' blood sample was analyzed again and it shows the increased in

platelets counts .From the blood reports and the patient's conditions it shows that our syrup which

was prepared from carica papaya leaf extract show potent increased in the platelets count and the dengue fever was treated with it. Above data is of people of all age groups, these patients were given

the above prepared syrup 30ml BID (two times a day) before meal for the adult patients and 5-10ml BID for children for 6 consecutive days and again their blood sample was analyzed and given below;

NO. OF PATIENTS:	NEUTROPHILLS COUNT: (/MI)	WBC _s COUNTS: (/MI)
1	7.0×10 ³	177×10 ³
2	6.9×10 ³	165×10 ³
3	8.9×10 ³	178×10 ³
4	7.8×10 ³	180×10 ³
5	8.4×10 ³	179×10 ³
6	8.9×10 ³	166×10 ³
7	7.9×10 ³	163×10 ³
8	9.5×10 ³	168×10 ³
9	9.3×10 ³	170×10 ³
10	7.4×10 ³	189×10 ³
11	9.1×10 ³	179×10 ³
12	8.7×10 ³	180×10 ³
13	9.6×10 ³	176×10 ³
14	9.2×10 ³	179×10 ³
15	7.3×10 ³	190×10 ³
16	7.9×10 ³	178×10 ³
17	7.6×10 ³	162×10 ³
18	8.7×10 ³	189×10 ³
19	8.3×10 ³	177×10 ³
20	8.9×10 ³	189×10 ³

The above data shows a drastic change in the patient and they are treated with dengue fever easily their platelets count increased and their condition is well stable which shows that the syrup also shows anti dengue properties.

DISCUSSION

From the above whole procedures and lab data and result we are able to discuss that the carica papaya leaf can be used greatly for the treatment of the dengue fever in people of all ages without having any side effects but because of its bitter taste we formulated the carica papaya leaf extract as syrup by adding different excipients so this formulation can be easily taken by the people suffering from dengue fever, as we don't have any vaccine and medication for the treatment of the dengue fever we can use these above prepared formulation to treat dengue fever which is one of the life threatening condition in the world especially in the Asia, 7,921

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dengue cases, 16 deaths across Pakistan reported by SAMA TV as we don't have any therapy for the dengue but our this therapy shows drastic result in increasing the platelets count of the patient and treating their disease so it shows that carica papaya leaf extract can be used for the treatment of the acute viral infection (dengue fever)

CONCLUSION

According to the results of manufacturing processes, chemical & physical parameters it has been concluded that product formulated in 200 ml syrup were manufactured & tested according to the controlled parameters and the results after testing are all within the acceptance criteria. Further, quantitative evaluation of bioactive components in PAP-LEF SYRUP formulation by TLC and HPTLC-densitometry. Also, the stability studies under required altered conditions of temperature, light and humidity confirmed all findings.

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