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## INVITRO SCREENING OF ANTACID ACTIVITY OF ETHANOL AND AQUEOUS EXTRACTS OF CARICA PAPAYA LEAVES BY ROSETTE RICE METHOD

Venu Madhuri R\*, Aruna B, Santhosh kumar G, Sree latha P, Shakeer S, Anusha G, Rajani K, G. Nagarajan

Dr. K. V.S ubba Reddy Institute of Pharmacy, Dupadu Railway station, N.H-7, Lakshmipuram Kurnool. Andhra Pradesh 518218

### Abstract

The purpose of the present investigation is to rule out the antacid activity of *Carica papaya* leaves by invitro Rosette rice method. The reason for selecting invitro method was to minimize the usage of experimental animals. In this method sodium bicarbonate used as standard drug, water and ethanol as control. The preliminary chemical test performed for the extract showed the presence of alkaloids, glycoside, flavonoids, saponins. Then they are evaluated for the antacid potency by Rosette rice time (the time during which the pH is maintained between 3-5). It was observed that aqueous extract of *carica papaya* leaves showed higher antacid activity than ethanolic extract.

### Keywords:

*Carica papaya*, antacid, Rosette Rice, pH, ethanol, water.

### Introduction

The human stomach secretes hydrochloric acid which is necessary for the digestion of food. When the stomach contains an excessive amount of hydrochloric acid then the condition is called as hyperacidity (or) acid dyspepsia common symptoms associated with dyspepsia are typical feeling of restlessness, feeling of nausea, actual vomiting, and stiffness in the stomach.<sup>(1)</sup> Antacids are drugs, used for neutralising excess acid in the stomach of patient suffering from hyperchlorhydria (hyperacidity).<sup>(2)</sup> Reduction in the acidity also inhibits the activity of pepsin. They also increase the tone of the lower oesophageal sphincter and hence reduces the reflux of the acid and gastric contents into oesophagus.<sup>(3)</sup>

Medical plants are an important source for many chemical components with different therapeutically effects. There are many plants which are having potential anti inflammatory, anti oxidant, antacids, used against cancer and many more activities.<sup>(4)</sup>

Papaya (*carica papaya*) is a tropical fruit having commercial importance because of its high nutritive and medicinal value. It is also called as papaw or pawpaw.<sup>(5)</sup> They contain valuable constituents in different parts of the plant such as fruits, leaves and seeds with different proportions. It has a wide range of medicinal properties for the treatment of diabetes, as birth control, as an antiseptic, antimicrobial, or diuretic, mild laxative, reduce inflammation lower cholesterol and so on.<sup>(6)</sup>

Flavonoids belong to the recently popular phytochemicals, chemical derived from plant material with potentially beneficial effects on human health. The therapeutic effects of many traditional medicines may be related in many cases to the presence of these polyphenols<sup>[7]</sup>. For example a wide variety of pharmacological activities have been reported for these substances, including antiviral<sup>[8]</sup>, antiallergic<sup>[9]</sup>, antiplatelet<sup>[10]</sup>,

antiestrogenic, anticancerogenic, antiinflammatory and their injection typically produces no or very low toxicity<sup>[11]</sup>. Flavonoids were also reported to act in the GIT having anti spasmotic<sup>[12]</sup>, antiulcer<sup>[13]</sup> and antisecretory properties<sup>[14]</sup>

## Materials and methods

### Plant material :

Fresh *carica papaya* leaves (papaya) was purchased from the local market of Kurnool (Andhra Pradesh, India). Fresh leaves were homogenised and dried under shade and thus mass obtained was powdered, weighed and subjected for the evaluation of antacid properties of the drug.

### Preparation of the extract:

The powdered plant material of *carica papaya* leaves were extracted by using solvents like ethanol and water. The extraction was done by the maceration method.

### Phytochemical analysis:

The qualitative phytochemical analysis of ethanolic and aqueous extract of *Carica papaya* leaves was carried out to determine the active phytochemical constituents which are responsible for the antacid activity.

### Determination of antacid activity by rosette rice method

Different quantities of ethanolic extracts i.e 400mg, 800mg, 1200mg and aqueous extract i.e 500mg, 1000mg, 1500mg of *carica papaya leaves* were taken for antacid evaluation using rosette rice method and the results obtained were compared with that of standard sodium bicarbonate ( 200 mg, 400mg, 500mg ) and control ( ethanol and water).

The rosette-rice test attempted to stimulate the stomach , and record the pH profile during acid neutralization reaction. The pH profile during the neutralization reaction was followed by adding 70 ml of 0.1 N HCl and 30 ml water , to a 500 ml reaction beaker. When the temperature was maintained at 37°C , different doses of ethanolic and aqueous extracts, standard and control (water and ethanol) were added into the reaction beaker under continuous magnetic stirring. Then 0.1 N hydrochloric acid was continuously added at a rate of 2ml/min, from the burette. A pH meter was attached to the reacting vessel, to record the pH during the neutralization reaction. The time taken to reach pH 3 and rosette rice time i.e the time during which the pH maintained between pH 3.0 and 5.0 was noted and also the pH changes were recorded as a function of time.<sup>(15)</sup>

## Results

### Preliminary phytochemical screening:

The qualitative phytochemical investigation of crude plant extract of *Carica papaya* revealed presence of flavonoids, alkaloids, saponins, glycosides whereas tannins are absent.

### Activity of ethanolic extract

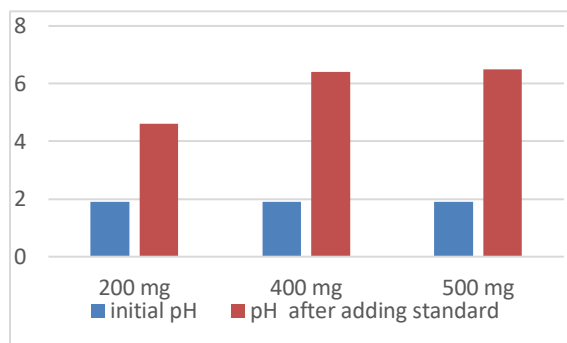
S.No	Dose	Initial pH	pH After adding extract	Antacid activity
1.	400mg	1.9	2.1	low
2.	800mg	1.9	2.3	low
3.	1200mg	1.9	2.5	Low
4.	Control(ethanol )	1.9	1.6	low

**Activity of aqueous extract**

S.N O	Dose	Initial pH	pH After adding extract	Antacid activity
1.	500mg	1.9	3.3	30 sec
2.	1000mg	1.9	3.5	4 min
3.	1500mg	1.9	4	5 min
4.	Control(water)	1.9	2.1	low

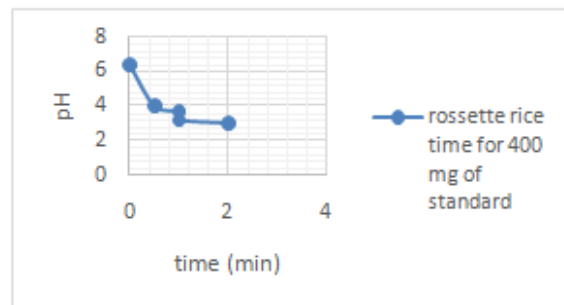
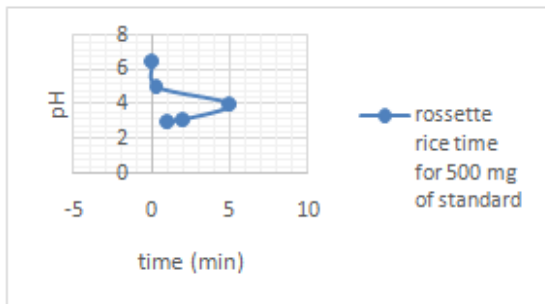
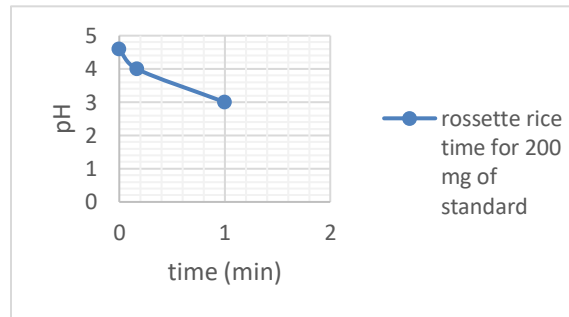
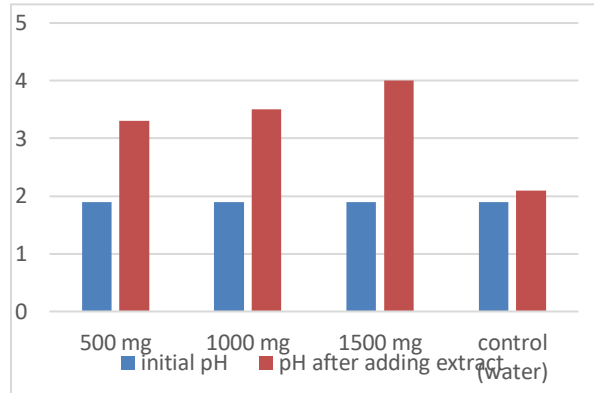
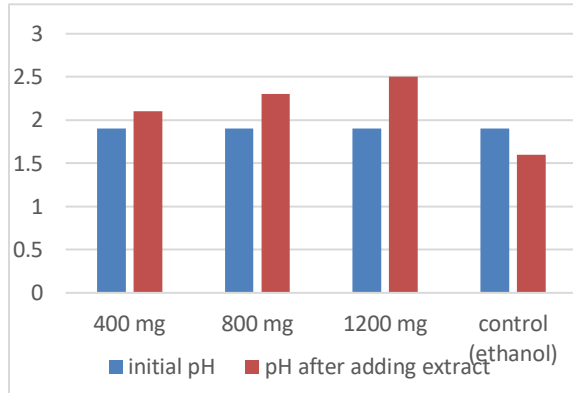
**Activity of standard drug (sodium bicarbonate)**

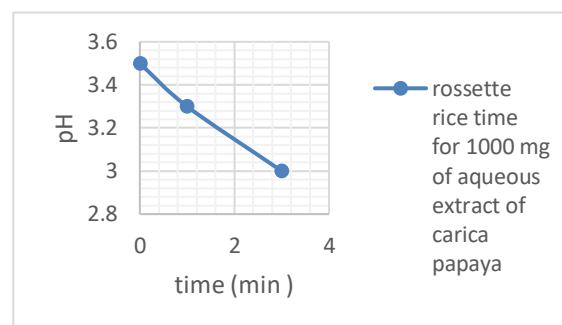
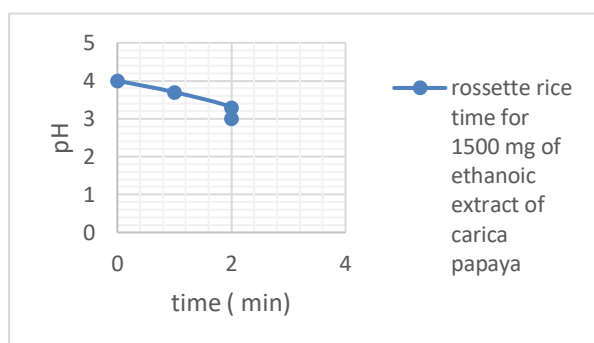
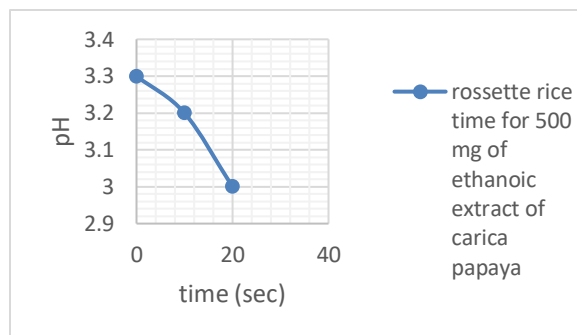
S.N O	Dose	Initial pH	pH After adding extract	Antacid activity
1.	200mg	1.9	4.6	1 min 10 sec
2.	400mg	1.9	6.4	4 min 30 sec
3.	500mg	1.9	6.5	8 min 20 sec

**Standard**

Ethanol extract

Aqueous extract





### Discussion and conclusion

Gastric hyperacidity is a most common problem. The major aggressive factors involve acid, pepsin, H. pylori etc whereas the defence factors are mucus, bicarbonate secretion etc. Hyper secretion of acid is a condition in which uncontrolled release of hydrochloric acid occurs. Antacids is a substance which neutralizes stomach acidity and is used to relieve heartburn, indigestion etc

In the present study investigation was conducted on evaluation of invitro antacid activity of ethanolic and aqueous extract of *carica papaya* leaves compared to standard (sodium bicarbonate) and control (water and ethanol). The antacid activity was determined by rosette rice method. Through phytochemical screening it was identified that leaves of *carica papaya* contains different chemical constituents like saponins, cardiac glycosides, alkaloids, flavonoids, etc. By observing tables 1-3. We can say that the antacid activity was low in ethanolic extract of *carica papaya* leaves, whereas aqueous extract of *carica papaya* leaves showed significant activity ( 500 mg- 30 sec antacid activity, 1000 mg- 4 min antacid activity, 1500 mg- 5 min antacid activity) , the activity of standard sodium bicarbonate ( 200 mg - 1 min 10 sec antacid activity, 400 mg - 4 min 30 sec antacid activity, 500 mg - 8 min 20 sec antacid activity) , low antacid activity was also seen in control ( ethanol and water) .thus it can be concluded that the antacid activity is highest in standard followed by aqueous extract of *carica papaya* leaves, followed by ethanolic extracts and control ( ethanol and water) . The duration of antacid activity of aqueous extract of *carica papaya* was found to be highest at 1500 mg when compared to standard sodium bicarbonate.

It can be concluded that the leaves of *Carica papaya* contains flavonoids, which might be helpful for its antacid activity. Thus we can conclude that the aqueous extract of leaves of *carica papaya* is able to act as a antacid but at a higher doses when compared with that of standard.

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