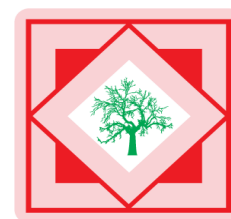




Pelagia Research Library

Der Pharmacia Sinica, 2012, 3 (1):20-23



Der Pharmacia Sinica
ISSN: 0976-8688

CODEN (USA): PSHIBD

Evaluation of Antacid & Carminative Properties of *Citrullus Lanatus* under simulated conditions

Swapnil Sharma¹, Sonika Jain², Gyanendra Singh³, Jaya Dwivedi² and Sarvesh Paliwal¹

¹Deptt. of Pharmacy, Banasthali University, Rajasthan, India

²Deptt. of Chemistry, Banasthali University, Rajasthan, India

³Apex institute of Pharmacy, Sitapura, Jaipur, Rajasthan, India

ABSTRACT

First report on carminative and antacid effects of peeled crude extract of the *Citrullus lanatus* fruit. The authenticated fruit was taken, dried, powdered & finally weighed. The carminative activity of the extract was quantitatively determined by carbon dioxide evolution method. The antacid behaviour was studied employing Rossett-Rice test. The *Citrullus lanatus* extract showed a significant results for carminative & antacid effect ($P < 0.05$) at different doses and the results obtained were comparable to that of standard NaHCO_3 .

Keywords: Hyperchlorhydria, Flatulence, Gastric ulcer, Carminative, Antacid.

INTRODUCTION

Recent awareness of therapeutic potential of several traditionally used plants has opened a new dimension for the study and research of medicinal plants. In traditional medicine, several Indian medicinal plants or their extracts have been used to treat hyperchlorhydria, flatulence and gastric ulcers. Hyperacidity, also known as acid dyspepsia is the condition of excreting more than the normal amount of hydrochloric acid in the stomach. Some causes for hyperacidity are peptic ulcers, gastroesophageal reflux disease, stomach cancer and certain types of diet that contains spicy food.

The prime medical factors of hyperacidity or acid dyspepsia are as follows: (i) Stomach Ulcers: Ulcers in the stomach are one of the prime causes of hyperacidity. Once this is diagnosed, the treatment will be done by the surgical removal of the stomach ulcers. (ii) Acid Reflux Disease: Some people have a gastric disorder called as the acid reflux disease. In this condition, the acids of the stomach, i.e. gastric acids or hydrochloric acid, get refluxed up to the food pipe, which is biologically called as the esophagus. When this happens, it builds up the level of acidity in the stomach. (iii) Stomach Cancers: Stomach cancers can also cause hyperacidity as one of their symptoms.

An estimated 15,000 deaths occur each year as a consequence of PUD. PUD is common in India, the Indian pharmaceutical industry have 6.2 billion rupees drugs share of antacids and antiulcer drugs and occupy 4.3% of the market share [10-13].

Flatulence is the state of having excessive stomach or intestinal gas. This can result in uncomfortable feelings of bloating, as well as increased belching (burping) or passing of gas from the rectum. Carminatives are the agents which induces the expulsion of gas from the stomach or intestines. Carminatives are often mixtures of essential oils and herbal spices with a tradition in folk medicine for this use [14].

Watermelon (*Citrullus lanatus*) family Cucurbitaceae is an excellent source of vitamin A, B & C necessary for energy production. Pink watermelon is also a source of the arginine, carotenoids, lycopenes, carbohydrate, sodium, magnesium, potassium & water [1]. Traditionally *Citrullus lanatus* is in use as energy source, cleanse and purify the kidney and bladder, lowers high blood pressure, prevent erectile dysfunction, act as antioxidant and used to treat enlarge liver & jaundice [2,3,4].

Exhaustive literature survey revealed that the potential of *C. lanatus* fruit in GIT ailment has not been exploited. Following this as a guiding factor in present research endeavor we here tried to evaluate scientifically the carminative & antacid properties of watermelon employing carbondioxide evolution method & Rossette Rice test [5,6]

MATERIALS AND METHODS

Fresh Watermelon (*Citrullus lanatus*) was purchased from the commercial market of Jaipur (Rajasthan, India) and botanical authentication was carried out at the Department of Botany, University of Rajasthan (voucher specimen no. RUBL20685).

Fresh fruit pulp was homogenized and dried under shade and thus mass obtained was powdered, weighed and subjected to the evaluation of carminative and antacid properties.

Determination of antacid potential:

Three different quantities i.e. 2.5, 5 and 7.5 gm of the drug extract of *Citrullus lanatus* were taken for antacid evaluation using Rossett-Rice method and the results obtained were compared with standard sodium bicarbonate. The method adopted herein simulated the acidic environment of stomach and records the change in pH with the time followed by administration of the different doses of crude extract of *C. lanatus* and standard sodium bicarbonate were recorded. A jacketed reaction vessel made up of borosilicate glass containing 70ml HCl and 30ml of water approximating the acidity of the gastric contents, was heated till the temperature of this simulated fluid reached to 37°C. Immediately 2.5 gm of *C.lanatus* extract was added. Simultaneously pH meter and recorder were turned on and a pump calibrated to add 0.1N HCl at a rate of 4ml/min was activated. The flow rate simulates the normal acid secretion rate. The pH was noted & the Rosette-Rice time was determined. The procedure was repeated for 5 and 7.5 gm of *C.lanatus* & 0.8 gm of sodium bicarbonate. The time during which the pH maintained 3-5 is the duration of effective pH control and termed as Rosette-Rice time. Rossett-Rice curve was prepared for drug extract and standard [5,6].

Determination of carminative potential:

For the evaluation of carminative profile three different quantities i.e. 2.5, 5 7.5 gm of *Citrullus lanatus* extract was placed individually in the Erlenmeyer flask containing 100 ml of distill water and following this 100 ml of NaOH {1M, previously standardized by oxalic acid} was poured into balloon. The balloon was secured immediately around the neck of the flask.

Flask was agitated slowly with the help of magnetic stirrer followed by greater agitation for next 30 min and was allowed to stand overnight. The evolved carbon dioxide gas was allowed to pass into a balloon containing excess sodium hydroxide where it was absorbed and converted into equivalent amount of sodium carbonate. The resulting mixture consisting of excess sodium hydroxide and sodium carbonate was titrated with standard HCl using phenolphthalein indicator to get first endpoint and in continuation to this the second endpoint was observed using methyl orange indicator. The same process was carried out with 0.1gm of standard sodium bicarbonate. The difference in milliliters between the first & second endpoints was used to calculate the carbon dioxide content per gram of sample.

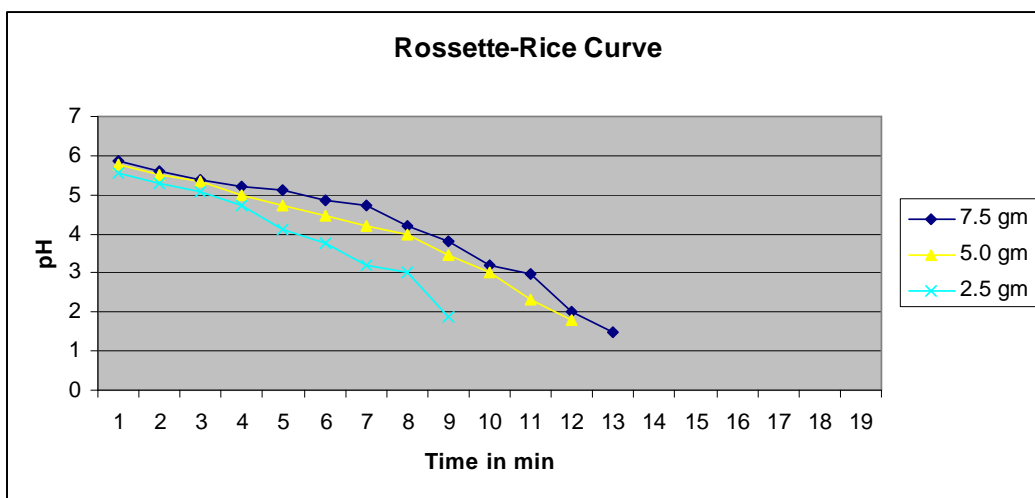
Mass of carbon dioxide produced by the drug sample and standard was calculated using the following formula:

Vol. of titrant x molarity of std. acid x mol. Wt. of CO₂ = mass of CO₂ in gm [3]

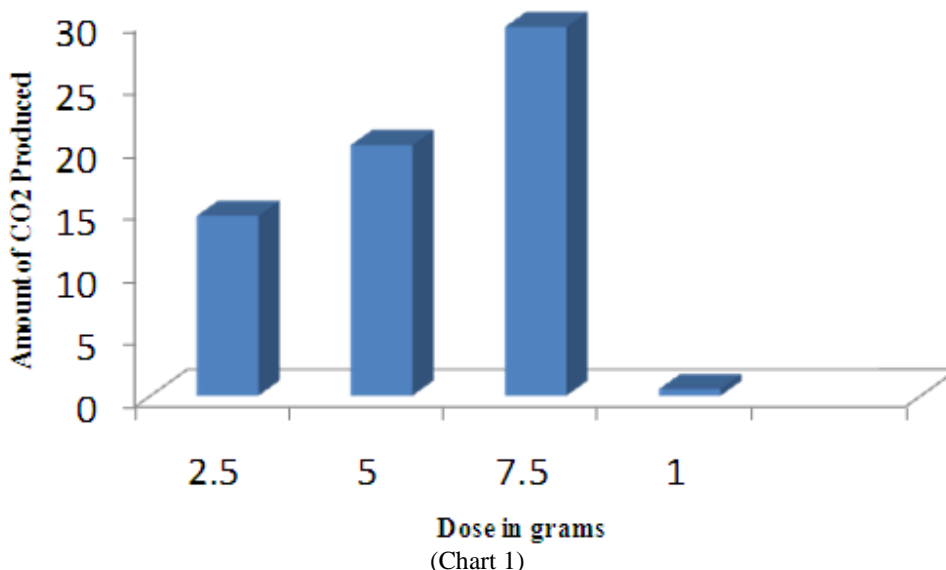
RESULTS

Antacid Profile

The antacid profile was evaluated in vitro using Rosette-rise test. The Rosette-rise time for 2.5 gm of *C.Lanatus* was found to be (7.22±.223) while for 5gm dose it was 9.85±.242 min and for 7.5 gm it was (11.32±.231) compared to standard 0.8gm NaHCO₃ which maintained the pH for 1.508±.015 min. Rossett-Rice curve was prepared for drug extract and standard (fig.1). Assays of all samples were conducted in triplicated and averaged. All groups were compared employing one-way analysis of variance (ANOVA) followed by Bonferroni's test. The results were termed significant statistically when probability was less than 0.05 (P<0.05).



(Fig. 1)



DISCUSSION

Now a day the problem of acidity is very common and the main causes behind this is over straneous life style, smoking and dependence on junk food. Antacids are agent that neutralizes the stomach acid responsible for

dysfunction of stomach. But they are meant to be used only occasionally. They should not be taken continuously for more than two weeks unless under a physician's directions as they produce serious side effects such as Milkalkali syndrome, loss of appetite, mood changes, muscular pain, nervousness, weakness, constipation, stones in kidney etc. Antacids are classified on the basis of how quickly they work and how long they provide relief. An ideal antacid should have adequate duration of action. This is related to gastric residence time i.e. how long a drug can maintain the pH of stomach above 3. The drug extract of *C.lanatus* showed potent antacid property in terms of Rossette-Rice time. The results of present study indicate that the Rosette-Rice time is dose dependent. However, the Rossett-Rice dynamic test conditions can be fulfilled by drug extract of *C.Lanatus* only at doses higher than the standard dose for antacid activity. But the higher dose of *C.Lanatus* can be safely ingested in view of its safety profile. It is suggested that herbal remedy for acid reflux can be used as the treatment of choice firstly because they cure the symptoms by strengthening the digestive system and secondly they result little or no side effect.

The usual cause of flatulence is incomplete digestion of carbohydrates. The symptom of flatulence is also managed by antacid therefore the adverse effect is similar to that of acidity problem. A carminative herb is an herb or nutritional supplement that is utilized to improve digestion or to treat dyspepsia or irritable bowel symptoms of ulcerative colitis. Results of present study suggested that the drug extract of *C. lanatus* has carminative property even at its lowest dose (2.5 gm). The drug extract of *C. lanatus* proved to have potent carminative effect as well as it produce a large amount of carbon dioxide compared to standard sodium bicarbonate. Drug extract of *C.lanatus* is rich in fibres and other nutrients, exhibiting both antacid and carminative activity. Therefore it is expected that the *C.lanatus* fruit will be prove as the ultimate remedy in the management of acidity & flatulence without side effects.

Acknowledgements

Authors are highly thankful to technical staff of Department of Pharmacy for their valuable support.

REFERENCES

- [1] Yativ M, Harary I, Wolf S, *Journal of Plant Physiology*, **2010**, 167, 589-596.
- [2] Francisco AH, Pedro AR, *Biology and Technology*, **2010**, 55,114-120.
- [3] Crossno SK, Kalbus LH, Kalbus GE, *Journal of Chem. Edu.*, **1996**; 73, 175-76.
- [4] Stanley LH, *Journal of chemical education*, **1975**, 52, 383-85.
- [5] Rossette NE, Rice ML, *Gastroenterology*, **1954**, 26, 490-95.
- [6] Carlos J, Serna I, Joe L, White I, Stanley H, *Journal of Pharmaceutical Sciences*, **2006**, 67, 324 – 327.
- [7] Geoffrey M, *Journal of chemical education*, **1988**, 65, 214-15.
- [8] Gabriely I L, Barzel JP, *New England journal of medicine*, **2008**, 358, 1952-6.
- [9] Cooke N, Teitebaum S S, Avioli, LV. *Archives of internal medicine*, **1978**,138, 1007-9.
- [10] Harshal Fegade et al. *Der Pharmacia Sinica*, **2011**, 2 (2): 46-53.
- [11] Madhu.C. DivakarI and Lakshmi Devi. S, *Der Pharmacia Sinica*, **2011**, 2 (2): 355-360.
- [12] Surabhi Bhatnagar etal. *Der Pharmacia Sinica*, **2011**, 2 (4):40-43.
- [13] Manjunath C, Elango K, Chandra Prakash K, *Der Pharmacia Sinica*, **2011**, 2 (4): 60-66.
- [14] Mr. S. B. Gokhale, Dr. C. K. Kokate, *Practical Pharmacognosy Nirali publisher*; **2008**; 39; 28-33.