



Research Article

**MONITORING THE MEDIA PH VALUE IN THE MIXTURE OF JUICE OF *CITRUS AURANTIUM* IN SYNTHETICALLY PREPARED GASTRIC JUICE: AN EXPERIMENTAL STUDY**

**Nuwansiri Liyanage Shalimal Buddhika<sup>1\*</sup>, Abeysooriya Sadini Rukshala<sup>2</sup>, Jayasinghe J.M.P.R.K<sup>3</sup>**

<sup>1\*</sup>Temporary Demonstrator, Department of Kayacikitsa, Gampaha Wickramarachchi Ayurveda Institute, University of Kelaniya, Sri Lanka.

<sup>2</sup>Assistant senior doctor, Suriyalanka Ayurveda Clinic, Thalalla Matara, Sri Lanka.

<sup>3</sup>Senior lecturer, Department of Dravyaguna, Gampahawickramarachchi Ayurveda institute University of Kelaniya, Sri Lanka.

**ABSTRACT**

According to Sri Lankan Ayurveda pharmacopeia, indication of Juice of *Abuldodam* (*Citrus aurantium*) in afternoon or evening is a good treatment for *Amla pitta*. According to Ayurveda *Citrus aurantium* is sour (*Amla rasa*) in taste, *Amlavipaka*, *Guru Guna* and *Ushnaveerya*. It is *Kapha-Vathashamaka*, *Rochana*, *Deepana* and *Anulomana* in *Anna Pachanavyuha* (GIT). Citric acid, pectin, lemon oil and carotene etc. are the main chemical compounds of *Citrus aurantium*. Common attitude is that most probably acidic fruits may be a cause for increasing the acid condition in the stomach. Society disagrees to use the juice of *Citrus aurantium* as a treatment of *Amlapitta*. But some Ayurveda and Traditional physicians have been used the juice of *Citrus aurantium* in the management of *Amlapitta*. Gastric acid is the digestive fluid, formed in the which shows of 1.5 to 3.5 and is composed of (HCl) (around 0.5%, or 5000 ppm). Gastric juice is a strong acid (as high as 0.1 M) usually secreted by the glands in the lining of the stomach and usually essential for the digestion. The amount of gastric juice in the stomach will vary from person to person. In the study, gastric juice was prepared in synthetically at the level of normal pH value in stomach following standard procedure. 10 samples of gastric juice were arranged in various pH values (0.86-13.11). 25ml of juice of *Citrus aurantium* was mixed into each sample. The pH value was measured with the temperature in three durations, on time, after 5 minutes and after 10 minutes. The P values were measured with standard software. The founded P valve is 0.955 at 95% confidence level. It can be concluded that there is no significant variation of the media pH value in the mixture of Juice of *Citrus aurantium* in synthetically prepared gastric juice.

**KEYWORDS:** *Amlapitta*, *Citrus aurantium*, Gastric juice, pH value.

**INTRODUCTION**

Ayurveda medical system is a one of great medical system which can cure and prevent many diseases of humans in world wide. Not only by Ayurveda but also the indigenous treatment system in Sri Lanka can cure and prevent many diseases by use herbal medicine. In addition, Sri Lankan since ancient times is used to consume many different parts of herbal plants such as barks, roots, flowers, leaves and fruits as food. So they have a resistance to some diseases within body itself. According to Ayurveda it can cure and prevent many diseases without any side effect by using herbal drugs such as leaves, roots, barks, fruits, nuts etc.

*Amla pitta* is a common disease in present society. The main reasons are foods, medicine, habits from human beings. They are fried foods, chili foods, busy life style, psychological problems, stress, side effects of drugs etc. There are many Ayurveda and western treatments for *Amla pitta* in present society. People use them according to their choice and attitudes. According to Ayurveda *Amla pitta* is a kind of disease, the patient who sense *Amlarasa* to the mouth. In the Allopathic medicine *Amla pitta* is similar to Gastritis. The gastric juice burn the epithelium cell layer of the stomach and create inflammation

condition in the stomach. According to Ayurveda *Pachaka pitta* and According to western Science Hcl gives acidity condition to gastric juice.

Some Ayurveda books are mentioned that *Abuldodam* (*Citrus aurantium*) juice give in afternoon or evening is a good treatment for *Amla pitta*. It is curious reason, because According to Ayurveda *Abuldodam* (*Citrus aurantium*) has *Amlarasa*, *Amlavipaka*, *Guru Guna*, *Ushnaveerya*. *Dosarupakarmas* are *Kapha Vathashamaka*. *Rochana*, *Deepana*, *Anulomana* are the activities in *Anna pachanavyuha*. Citric acid, pectin, lemon oil, carotene are the main chemical compounds of *Abuldodam*<sup>[1]</sup>

It will increase acid contain in the stomach. Due to that reason *Amla pitta* condition will incise. Most of people disagree to use *Abuldodam* (*Citrus aurantium*). But some Ayurveda and *Desheeya* doctors used *Abuldodam* juice for *Amlapitta*. *Citrus aurantium* belong to *Rutaceae* family. Small tree to 10m tall with large spines on younger branches.

**Importance of research**

*Amla pitta* is a disease what can increase due to people's careless life style. According to the Ayurveda it

mentioned as *Prachchaparada*. It is a disease can cure in primary condition *Amla pitta*. But it got worse it can only controlled. According to the Ayurveda these are two type of treatment method.

1. Prevent the disease
2. Treat to disease

Among these methods prevention is the most important to this society.

*Abuldhodam (Citrus aurantium)* is a common plant in Sri Lanka. Due to that reason all the people can get benefit of anti-gastritis activity of juice of *Abuldhodam (Citrus aurantium)*. It is simple and easy to prepare and it is tasty drink. Because it can easy to use children. I think this is important to prevent the disease.

Hyperacidity or acid dyspepsia simply means increase of acidity in the stomach. 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. Sometimes, hyperacidity is confused for a simple bellyache. This is because people with hyperacidity usually generally get pains in their stomachs with similar symptoms as bellyaches. This confusion is more rampant in children who cannot differentiate between different kinds of stomach ailments. However, hyperacidity can be found out with the sour belching and aftertaste of the already eaten food in the mouth.

**The prime medical factors of hyperacidity or acid dyspepsia are as follows**

**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.

**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.

*Abuldhodam (Citrus aurantium)* has citric acid and it is taste of acid (*Amla rasa*). because of that reason they think acid condition will increase getting juice of *Abuldhodam*.

But some Ayurveda books and practitioners are using juice of *Abuldhodam (Citrus aurantium)* in evening time to *Amlapitta* condition. It must be has anti-gastritis activity.

Plant of *Citrus aurantium* (Rutaceae)



**Eng:** sour orange

**Sans:** *Jambira*

**Sin:** *Abuldhodam*

**Tam:** *Naranga*

**Hin:** *Khata*

**Panchapadartha**

**Rasa:** *Amla*

**Guna:** *Guru*

**Veerya:** *Sheetha*

**Vipaka:** *Amla*

**Description**

Small tree to 10m tall with large spines on younger branches. Leaves alternate with winged-petioles, the blade ovate, bluntly toothed. Emitting a strong citrus odor to the presence of copious oil glands. Flowers axillary borne singly to numerous seed within. Flowers usually during warmer months and fruit available later in year.

**Habitat**

Cultivated and possibly naturalized in some location.

**Part used:** Leaves, Barks and fruits.

**Chemical constituents**

Dipentine, Linalol, Citral, Limonene, Flavonoids, Vitamins A, B, C, Citric acid, Pectine, Fatty oil.

**Method**

**Preparation of juice of *Citrus aurantium***

The juice extracted from a fresh green drug by pounding it and squeezing through cloth is called *Swarasa*.<sup>[2]</sup>

Prepare synthetic gastric juice in normal value of pH in stomach.

**Preparation of Synthetic Gastric Juice**

- Dissolve 5 g pepsin, 8.75 g conc' hydrochloric acid, and
- g of lactic acid in 500 mL of DI water
- Dilute to 1 L and stir gently to avoid foaming. <sup>[3]</sup>
- Method of preparation 8.75 g conc' hydrochloric acid
- $\rho_{Hcl} = \text{special gravity of Hcl} \times \rho_{H_2O}$   
 $1.18 \times 0.999 \text{ gcm}^{-2}$

$$1.178 \text{ gcm}^{-2}$$

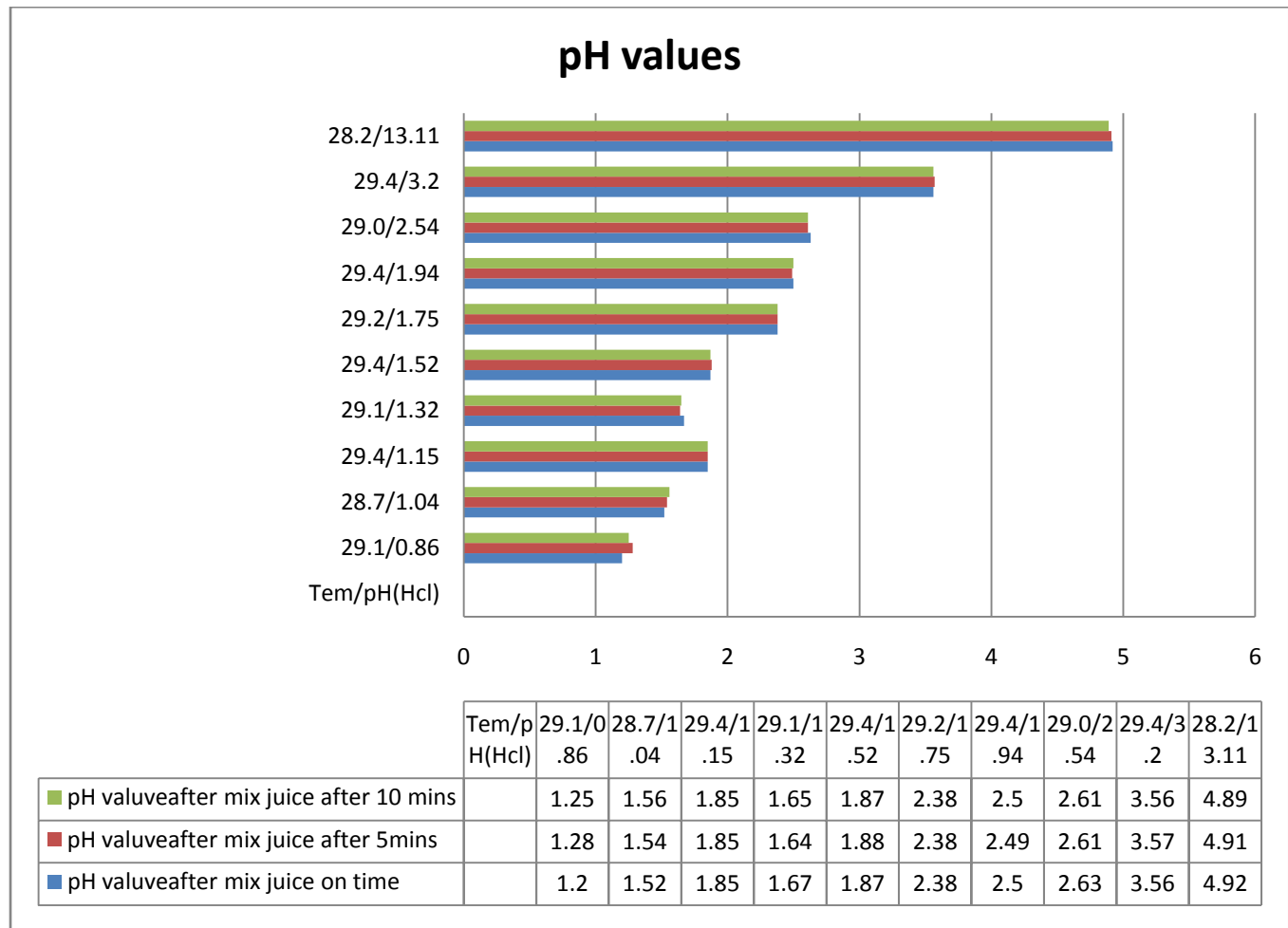
$$V = \frac{m}{\rho} = 8.75g / 1.178 \text{ gcm}^{-2} = 7.42ml \text{ (Volume adding Hcl sg-1.18)}$$

Prepare 10 samples of gastric juice in various pH value. Adding small amount as drops of Hcl in sg-1.18 as drops. Then measure the pH value with temperature.

Sample (25ml) No	Temperature	pH value
1	29.1	0.86
2	28.7	1.04
3	29.4	1.15
4	29.1	1.32
5	29.4	1.52
6	29.2	1.75
7	29.4	1.94
8	29.0	2.54
9	29.4	3.2
10	29.4	13.11

Mix 25ml of juice of *Abuldhodam* (*Citrus aurantium*) for each sample  
 Then measure the pH value with temperature  
 On time, After 5 minutes, After 10 minutes  
 At last measure the P value with temperature

**Results**



**CONCLUSION**

The founded P valve is 0.955 at 95% confidence level. It can be concluded that there is no significant variation of the media pH value in the mixture of Juice of *Citrus aurantium* in synthetically prepared gastric juice

**ACKNOWLEDGEMENT**

This research study embraces much dedication and really assistance received from many people and organizations who contributed in plentiful ways to complete this study. There for, I take this opportunity to convey mix gratefulness every one of them First I pay gratitude to my dynamic and inspirational supervisor, senior lecture and dissertation coordinator Dr. J.M.P.R.K.Jayasinghe for all the guidance and continuous encouragement provided to me. I am also indebted to her for the construction, criticisms and most importantly to her extra ordinary patience. I also convey my nearest thanks to all the head of departments. Basic principles, Dravyaguna, Kayacikitsa to the support given. Special thanks for Director of Gampaha Wickramarachchi Ayurveda institute, Department of Bio-chemistry Faculty of medicine University of Kelaniya and also staff of the laboratory Gampaha Wickramarachchi Ayurveda institute.

It is also my obligation to acknowledgement the offered in numerous ways by all the lectures and non-academic staff members in all the departments. Last but not least, I gave my immeasurable thanks to my parents and ma batch mates.

**REFERENCES**

1. Ayurveda aushadhasangrahaya, 1<sup>st</sup> steps, 3<sup>rd</sup> part, Publication of the Department of Ayurveda, Sri Lanka.
2. Kumarasinghe A, Madhavanidana Publication of the Department of Ayurveda, Sri Lanka.
3. Srikantha Murthy K.R, Madhavanidana, Chaukhambha Orientalia, Varanasi,1987.
4. Srikantha Murthy, K.R, Sarngadhara Samhitha, Chaukhambha Orientalia, Varanasi,1982
5. Jayasingha D.M, Hansarajanidana, Publication of the Department of Ayurveda, Sri Lanka,1983
6. Samarakoon S P, Hela Flora, Godage international publishers (Pvt) Ltd, Colombo,2009.

7. Jayaweera D M A, Medicinal plant used in Ceylon, part 2, The national science foundation, Sri Lanka, 1998.
8. 1<sup>st</sup> Volume, Osuthuruvisithuru, Department of Ayurveda, Colombo -08,1994.
9. Department of Ayurveda, Compendium of medicinal plant A Sri Lankan study, Volume - IV, Deepani Publishers, Nugegoda. 2004.

**Cite this article as:**

Nuwansiri Liyanage Shalimal Buddhika, Abeysooriya Sadini Rukshala, Jayasinghe J.M.P.R.K. Monitoring The Media Ph Value In The Mixture Of Juice Of Citrus Aurantium In Synthetically Prepared Gastric Juice: An Experimental Study. International Journal of Ayurveda and Pharma Research. 2016;4(6):9-12.

**Source of support: Nil, Conflict of interest: None Declared**

**\*Address for correspondence**

**Dr Nuwansiri Liyanage Shalimal Buddhika**

Temporary Demonstrator,  
Department of Kayacikitsa, Gampaha  
Wickaramarachchi Ayurveda  
Institute, University of Kelaniya, Sri  
Lanka,

Email:

[buddhikanuwansiri1987@gmail.com](mailto:buddhikanuwansiri1987@gmail.com)

Ph: 0094769019854

