



Research Article

Formulation And Evaluation Of Herbal Vitamin C Tablet

Abhishek A. Adhav*, Abhishek U. Gaikwad, Abhijeet R. Shete, Megha T. Salve

Department of Bachelor in Pharmacy Shivajirao Pawar College of Pharmacy, Pachegaon, Ahilyanagar-413725.

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ABSTRACT

Vitamin C, also known as L-ascorbic acid, is a water soluble vitamin that is naturally present in some foods, added to others, and available as a dietary supplement. Vitamin C is one of the essential dietary components but some humans cannot produce due to the absence of a critical enzyme in the biosynthesis pathway, and have to consume vitamin C nutraceutical supplements such as vitamin c tablets. The purpose of this research work is to study the properties of vitamin C and formulating a tablet of vitamin C by using natural/herbal ingredients. The tablets made of vitamin C made in this research will be elevated.

INTRODUCTION

Vitamin C is also known as ascorbic acid. It is an antioxidant and water soluble vitamin. It is a micronutrient required for a multitude of biological functions, and is perhaps best known for its role as a terminal small-molecule antioxidant. At physiological pH, ascorbic acid most commonly exists in its mono-anion form, ascorbate. Synthesis of vitamin C (a 6-carbon lactone) from glucose occurs in the liver of many mammalian species; however, both guinea pigs and primates (e.g., humans) lack the terminal enzyme. This biosynthetic pathway (L-gulonolactone oxidase), and thus rely on dietary sources. Vitamin C performs a variety of functions that may explain why it has immune-modulating

properties. Its ability to donate electrons protects biomolecules from oxidative damage caused by cell metabolism and exposure to toxins and pollutants, making it a powerful antioxidant. Vitamin C is a cofactor for enzymes involved in biosynthesis and gene regulation, including monooxygenase and dioxygenase.

Functions of vitamin C:

- Vitamin C is one of numerous antioxidants. Antioxidants are nutrients that reduce the damage caused by free radicals.
- It enhances iron absorption from plant-based sources.
- It aids the body's ability to fight infections.
- Improves bone formation.

*Corresponding Author: Abhishek A. Adhav

Address: Department of Bachelor in Pharmacy Shivajirao Pawar College of Pharmacy, Pachegaon, Ahilyanagar-413725.

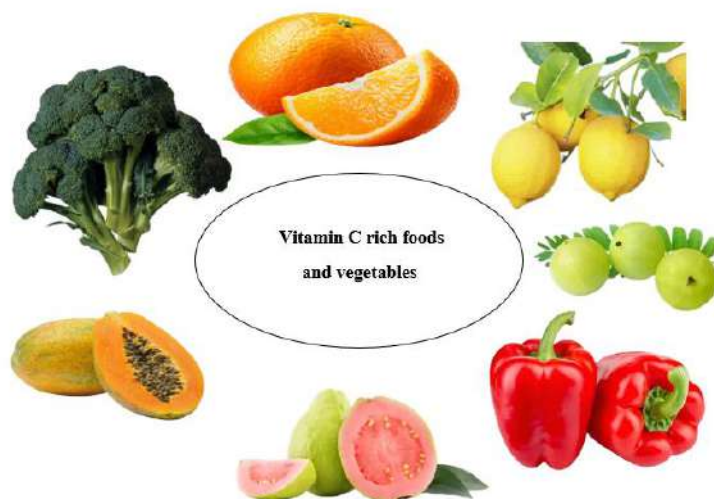
Email ✉: adhavabhi007@gmail.com

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- The body cannot produce vitamin C on its own. It does not store vitamin C. It is important to include plenty of vitamin C-containing foods in your daily diet.
- Create collagen, a crucial protein that is necessary for the formation of blood vessels, tendons, ligaments, and skin.
- All of the tissues in your body require vitamin C to develop and heal.
- It guards against heart disease and stops cholesterol from building up on artery walls.
- Collagen is the glue that keeps cells together, and it aids in the synthesis of collagen.

Food sources of vitamin C:



- Oranges - 53.2mg/100gm
- Papaya - 61mg/100gm
- Lemon - 53mg/100gm
- Amla - 300mg/100gm
- Broccoli - 89.2mg/100gm
- Guava - 228.3mg/100gm
- Red pepper - 80.4mg/100gm

Amla fruit is high in vitamin C, tannins, polyphenols, fibre, minerals, proteins, and amino acids. Research indicates that amla has hypoglycemic, anti-inflammatory, anti-hyperglycemic, anti-hyperlipidemic, and antioxidant properties, both in animals and humans. Orange is high in potassium, ascorbic acid, folate, polyphenols, flavonoids (naringin, hesperidin, neohesperidin, citronin, narirutin), and polymethoxylated flavones (tangeritin, nobilitin, sinensetin).

Lemon is a great source of vitamin C. Limonene is the primary element. Leaf oil was recognized with β - pine, myrcene, neral, geranial, neryl acetate, geranyl and β -caryophyllene. Peel oil had μ -terpinine, β -pinene, myrcene. Modified Starch is used as a binder. When compared to pure starch-based binder, it has an appropriate viscosity and high affinity binding. Vitamin C is most inevitable essential dietary factor for human. Thus, looking towards high nutrient values of amla, lemon & oranges, we decided to formulate Vitamin C tablets & evaluate its potency by comparing it with Standard Vitamin C tablet.

MATERIALS AND METHODS:

The concept is to make vitamin c tablets by using stationary materials

- Amla
- Oranges
- Lemons

First, take 250 gm amla and cut it into pieces for four to five days before drying them in the sun. and grind these pieces to make powder. Take 300gm fresh oranges take out juice from that oranges. Take 200gm fresh lemon and take out juice from it.

Preparation of tablets:

- Take 60gm dried amla powder prepared from 250gm amla fruit.
- Add 15ml lemon juice.
- 30ml orange juice in dried amla powder and mix it well.
- Add 1gm starch soluble powder used as binder in tablets and mix it well.
- Let it dry for about 12hrs.
- Pass this mixture through sieve to make granules.
- Compress these granules in tablet compressing machine.

RESULTS AND DISCUSSION:

The herbal vitamin C tablet has been successfully formulated and tested using IR Spectroscopy and HPLC (High Performance Liquid Chromatography).



Analysis:

The prepared vitamin C tablet was tested using IR analysis and high-performance liquid chromatography (HPLC) to identify any potential functional groups and compare its potency to a normal vitamin C tablet available in market.

FT-IR analysis:

The measurement of the absorption, emission, or reflection of infrared radiation by matter is known as infrared spectroscopy, sometimes known as vibrational spectroscopy or IR spectroscopy. It is employed in the study and identification of solid, liquid, and gaseous chemical compounds or functional groups.

Graphical interpretation:

IR spectroscopy of prepared vitamin c tablet showed frequencies (cm-1) at 3500-2800(b), 2920.80, 1740.6, 1645.40, 1470.85, 1330.14, 1241.30, 1295.23, 1120.80, 1085.18, 968.35, 765.16, 665.37, 636.60 indicating methylene, alkenes, hydroxyl, ether groups of vitamin C.

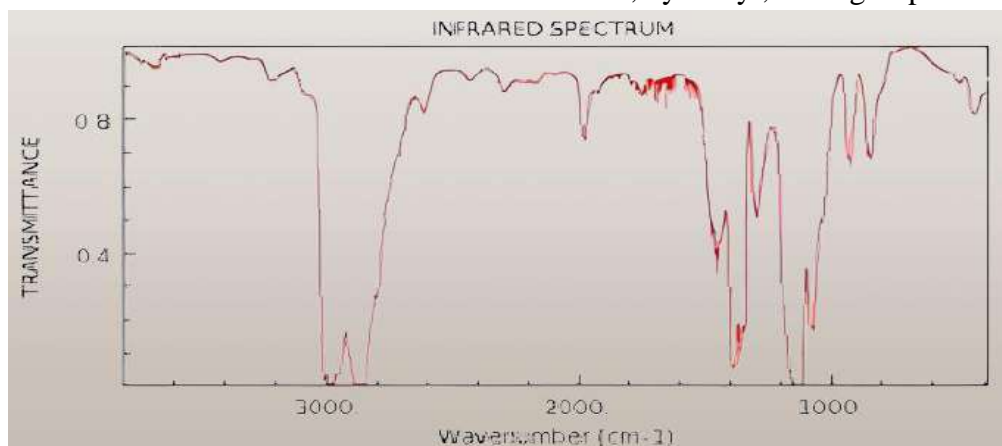
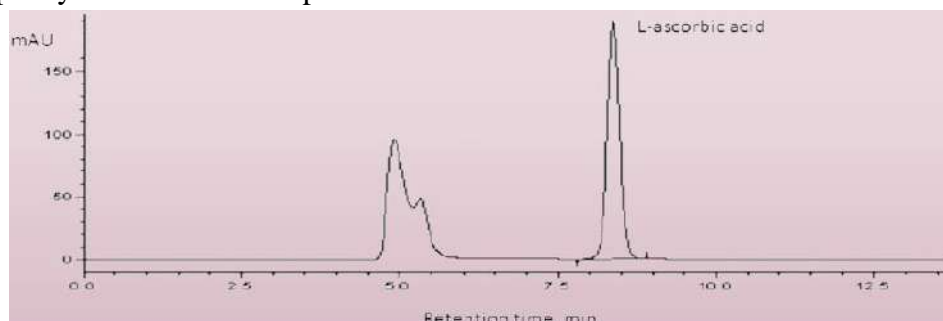


Fig no 1: IR Spectrum of prepared vitamin c tablet.

HPLC Analysis: high-performance liquid chromatography (also known as high-pressure liquid chromatography, or HPLC) is a chromatographic technique that is used to identify, measure, and purify the different components of a

mixture. A prepared vitamin C tablet was tested using HPLC at 207 nm to ensure its potency and purity



STANDARD	AREA	RETENTION TIME (RT)
PREPARED VITAMIN C	3080699	8.439

The prepared vitamin C tablet's potency of 95% and retention duration of the above HPLC study match the vitamin C graph, indicating a successful formulation of the tablet. Preparing a herbal vitamin C tablet, mix together 250g of amla powder, 200g of lemon, 300g of orange, and 1g of starch powder. Then, form tablets using the mixture. With 80 tablets weighing roughly 550 mg each and an 85rs cost, there are 1.06 rupees each tablet.

CONCLUSION:

prepared herbal vitamin C tablets examined using IR and HPLC methods. We used HPLC techniques to find vitamin C potency of 95%. Our herbal vitamin C tablets come with a price of 1.06.

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