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Original Article

Formulation and Development of Herbal Vitamin C Tablet

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ABSTRACT

One of the essential dietary components, 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. However, some humans are unable to produce vitamin C because they lack a crucial enzyme in the biosynthesis pathway, so they must consume vitamin C nutraceutical supplements like vitamin C tablets. The goal of this research project is to investigate the characteristics of vitamin C and formulate a tablet of vitamin C using natural/herbal ingredients. The vitamin C tablets created in this study will be elevated.

Keywords: Herbal Vitamin C Tablet, water soluble, crucial enzyme

INTRODUCTION

Ascorbic acid is another name for vitamin C. It is a water-soluble vitamin and antioxidant. This micronutrient is necessary for numerous biological processes, and its activity as a terminal small-molecule antioxidant is arguably its most well-known attribute. Ascorbate, the mono-anion form of ascorbic acid, is most frequently seen at physiological pH. Many mammalian species' livers can synthesize vitamin C, a 6-carbon lactone, from glucose; however, the terminal enzyme is absent in guinea pigs and primates, including humans. Consequently, they depend on dietary supplies for this biosynthesis route (Lgulonolactone oxidase). Numerous processes carried out by vitamin C could account for its immune-modulating qualities. It is a potent antioxidant because of its capacity to donate electrons, which shields biomolecules from oxidative damage brought on by cell metabolism and exposure to toxins and pollutants. Enzymes like monooxygenase and dioxygenase that are involved in biosynthesis and gene regulation require vitamin C as a cofactor.

- **Equation**

• 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.

RESEARCH METHODOLOGY

1. Selection of Herbal Sources

Identify and select plant sources rich in vitamin C, such as:

- Amla (Emblica officinalis)
- Orange juice
- Lemon juice
- Rose hips (Rosa canina)

2. Extraction and Standardization

Use the right solvents (such as ethanol and methanol) and methods (such as sonication and maceration) to extract the active ingredients. Standardize the extract to guarantee that each batch has the same amount of vitamin C. High-Performance Thin-Layer Chromatography (HPTLC) may be used in this process to measure the amount of ascorbic acid.

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3. Formulation Development

Create tablet formulations that incorporate binders (e.g., microcrystalline cellulose, gelatin) and disintegrants (e.g., maize starch) to obtain the necessary tablet hardness, friability, and disintegration time. To establish the appropriate excipient ratios, use Design of Experiments (DoE) software.

4. Quality Control and Evaluation

Conduct standard quality control tests to assess:

- Organoleptic properties **(**color, odor, taste)
- Physical characteristics (size, shape, texture)
- Mass uniformity
- Hardness and friability
- Disintegration time
- Dissolution profile

5. Stability Testing

Conduct stability tests in a range of environments (temperature, humidity, etc.) to evaluate the tablets' integrity and shelf life. Tests could consist of:

- Accelerated stability testing
- Thermal stress testing
- Freeze-thaw cycles
- Centrifuge tests

6. Data

Sr No	Ingredients	Quantity	Role
1	Amla powder	60gm	Vitamin content
2	Lemon juice	15ml	Antioxidant property
3	Orange juice	30ml	Flavouring agent

Sources of Data:

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

Vitamin C, tannins, polyphenols, fiber, minerals, proteins, and amino acids are all abundant in amla fruit. Amla has been shown tohave anti-inflammatory, antihyperglycemic, antihyperlipidemic, hypoglycemic, and antioxidant qualities in both people and animals. Oranges are rich in flavonoids (naringin, hesperidin, neohesperidin, citronin, and narirutin), polymethoxylated flavones (tangeritin, nobilitin, and sinensetin), potassium, ascorbic acid, folate, and polyphenols. Lemon is an excellent source of vitamin C. Limonene is the main element. Ieaf oil was identified with β-pine, myrcene, neral, geranial, neryl acetate, geranyl, and β-caryophyllene. Peel oil contained μ-terpinine, β-pinene, and myrcene. Modified starch is used as a binder. Compared to pure starch-based binders, it has a suitable viscosity and high affinity binding. Vitamin C is a vital nutritional

element for humans. We created Vitamin C tablets based on the high nutritious content of amla, lemon, and oranges and tested their potency against standard Vitamin C tablets.

RESULT

Herbal vitamin C tablet are prepared and evaluated. The herbal vitamin C tablet formulated using natural sources such as amla, orange, and lemon has undergone comprehensive evaluation to assess its quality and efficacy. The formulation process involved drying and powdering amla, extracting juices from fresh oranges and lemons, and combining these with a starch binder to form granules, which were then compressed into tablets.

DISCUSSION:

The development of herbal vitamin C tablets presents a promising avenue for delivering this essential nutrient through natural sources, catering to the growing consumer preference for plant-based supplements. These tablets are typically formulated using vitamin C-rich fruits such as amla (Indian gooseberry), oranges, and lemons, known for their high ascorbic acid content and additional health benefits.

Figure Table:

Test	Methodology	Standard values	Test values
General Appearance	Visual inspection	Tablet should be uniform in colour, shape and size	Tablet should be good in apperance
Thickness & Diameter	Micrometer/caliper measurement	3-6mm 6-12mm	4mm 8mm
Weight Variation	Weigh 20 tablets, calculate average	Not more than 5%	3%
Content Uniformity	Assay 30 tablets, 10 individually	425-575mg	450mg
Hardness	Tablet hardness tester	4-8 kg/cm^2	6 kg/cm^2
Friability	Roche Friabilator test	Weight Loss ≤1% after 100 rotation	0.1% weight loss
Disintegration	Disintegration apparatus	15 minutes	16 minutes
Dissolution	Dissolution apparatus	45 minutes	43 minutes

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