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Development, Formulation And Evaluation Of Chewable Tablet From Amla, Milk And Mint Powder.

Sahil Deshmukh1 , Aditya Chavan2 , Ahmed Raza3 , Pratik Shinde4, Harsha pawar5 , Shivani Pawar6

[corresponding author]

1,2,3,4,5,6- CHHATRAPATI SHIVAJI MAHARAJ UNIVERSITY , SCHOOL OF PHARMACY , NAVI MUMBAI , PANVEL

ABSTRACT

The aim of present study was to formulation and development of herbal chewable tablet from amalaki (Embelica officinalis Gaertn.),mint, and milk powder. The chewable tablet is prepared by wet granulation method. The evolution of chewable tablet was done on different parameters, like hardness test, friability test,
disintegration time test, weight variation test were examined. Here an effort is made to increase the formulation palatability, shelf life and masking the taste by turning it into chewable tablet without changing its properties.

Key Word: Embelica officinalis Gaertn, chewable tablets, wet granulation method.

INTRODUCTION

Āmalaki (Emblica officinalis Gaertn.) belongs to family Euphorbiaceae ascending to 1300 m on hills, abundantly available throughout India. The proven pharmacological properties of Amalaki are imunomodulatory activity, antipyretic and analgesic activity, hepatoprotective activity, cytoprotective activity, antitussive activity, gastoprotective activity, ophthalmic disorder, antibacterial activity, radioprotective activity, chemopreventive activity, antitumor activity, antiulcer activity, hypocholesterolemic activity, hypolipidemic activity, antimutagenic activity, antioxidant activity, anticancer activity, antiproliferative activity. There are many formulations explained in classics having Emblica officinalis Gaertn. as main ingredient. Although they are potent enough in treatment, they are not stable for longer duration due to their plant origin and as they are organic in nature they easily deteriorates with microbial contamination. Among those Dugdhamalakyadi Yoga. is one important plant based preparation in which Amalaki (Emblica officinalis Gaertn.)

Objectives

1. Nutrient Delivery: To deliver essential nutrients such as Vitamin C, antioxidants, and minerals present in Amla to support overall health.

2. Immune Support: To enhance immunity through the high Vitamin C content and antioxidant properties of Amla.

3. Digestive Health: To support digestion and gut health by leveraging Amla's natural fiber and digestive-enhancing properties.

4. Easy Consumption: To offer a convenient and pleasant way to consume Amla, especially for individuals who dislike its raw taste or have difficulty swallowing traditional tablets or capsules.

5. On-the-Go Wellness: To provide a portable and easy-to-use form of Amla that can be consumed anytime, anywhere, without water or preparation.

6. Palatability: To improve the taste of Amla, making it more appealing, especially for children and individuals sensitive to its sour flavor.

7. Nutraceutical Benefits: To act as a dietary supplement for managing issues like oxidative stress, skin health, hair health, and energy levels.

8.

9. Natural and Holistic Wellness: To promote holistic health using Amla, an ingredient with a long history in traditional medicine systems like Ayurveda.

Advantage of Chewable Tablet:-

1. Better bioavailability through bypassing disintegration (that increase dissolution)
2. Improved patient acceptance (especially pediatric) through pleasant taste
3. Patient convenience; need no water for swallowing
4. Possible to use as a substitute for liquid dosage forms where rapid onset of action is needed
5. Absorption of drug is faster

INGRIDIENTS & METHOD

Ingridients:-

Table no:-1

Sr no.	Ingridients	Quantity
1.	Amla powder	250mg
2.	Mint powder	100mg
3.	Milk powder	250mg
4.	Sodium starch glycolate	50mg
5.	Talc powder	6mg
6.	Sucrose	140mg
7.	Methyl Paraben	0.01%
8.	menthol	15mg
9.	Water	Qs

1. **Amla powder:-**

PREPARATION OF AMALAKI POWDER:

Fruit pulp that had been fully dried was ground into a powder in a pulverizer and then run through a 100 screen. The powder was then collected in a sterile, airtight jar.

1. Take amla
2. washing and sorting
3. machinne peeling
4. blanching
5. shredding
6. drying
7. grinding
8. powder
9. packing

Chewable pills include amla powder because of its numerous health benefits, which include:

1) Vitamin C: The body can better absorb other nutrients when it has enough of this vitamin, which is abundant in amla. Antioxidants like vitamin C shield cells from harmful free radicals.

2) Brain function: Amla can help improve brain function and cognitive performance.

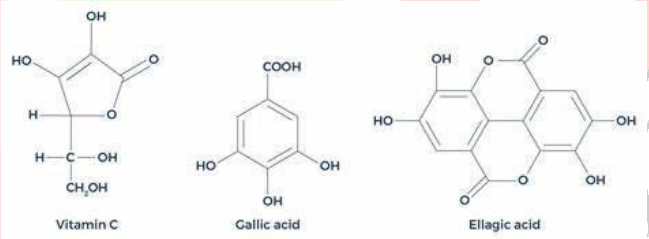

Fig no:-1

2. **Mint powder:-** Mint Powder is a fine powder derived from dried mint leaves, commonly from the Mentha species, such as Mentha piperita (peppermint) or Mentha spicata (spearmint). It captures the distinct, refreshing flavor and aromatic qualities of mint and is used in various culinary, medicinal, and cosmetic applications. Mint powder is a versatile and beneficial product with a wide range of uses, from culinary applications to natural health remedies and cosmetic products. Its cooling, soothing, and therapeutic properties make it a popular choice in traditional and modern treatments.

Digestive Aid: Mint powder is commonly used in traditional medicine for its digestive benefits. It helps relieve indigestion, bloating, and stomach cramps by relaxing the muscles of the gastrointestinal tract. It can also alleviate nausea and promote appetite.

Respiratory Health: The menthol in mint powder has a soothing effect on the respiratory system. It may help relieve symptoms of colds, coughs, and congestion by acting as a natural decongestant.

Anti-inflammatory and Antioxidant: Mint powder is rich in antioxidants, which help neutralize free radicals in the body. It also has anti-inflammatory properties that can aid in reducing swelling and discomfort in conditions like arthritis

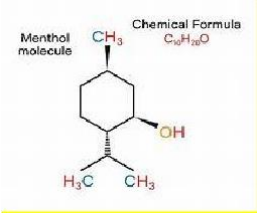

Fig no:-2

3. **Milk powder:-** Milk powder can be cohesive due to its fat and moisture content, which can affect its flowability. To improve the flowability of milk powder, a glidant like talc can be added to the formulatons.

Milk in form of powder can easily dissolve and reconstitute with water especially in the type of instant powder-a milk powders,which is in an agglomerated form, a form that single particles have formed bigger agglomerates or granules make it instantly dissolve in chilly water.

Nutritions	Values/100 g
Energy	460 kcal
Energy from fat	180 kcal
Total fat	20 g
Saturated fat	12.4 g
Cholesterol	52 mg
Sodium	88 mg
Total carbohydrates	50 g
Added Sugar	18 g
Protein	20 g
Calcium	1000 mg

4. **Sodium starch glycolate**:- Sodium starch glycolate is the sodium salt of carboxymethyl ether. Starch glycolates are of rice, potato, wheat or corn origin. Sodium starch glycoate is a white to off-white, tasteless, odorless, relatively free flowing powder. Sodium starch glycolate is used as a pharmaceutical grade dissolution excipient for tablets and capsules. Sodium starch glycolate absorbs water rapidly, resulting in swelling which leads to rapid disintegration of tablets and granules. It is used as a disintegrant, a suspending agent and as a gelling agent. Without a disintegrant, tablets may not dissolve appropriately and may affect the amount of active ingredient absorbed, thereby decreasing effectiveness.

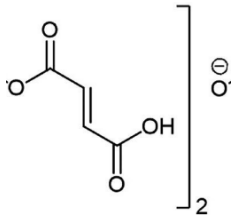

Fig no:-3

5. **Talc powder:-** Talc serves as a glidant in capsule formulations and as a lubricant and diluent in tablet formulations. In addition, it serves as a bulking agent in some powders as an excipient in topical and oral solutions. Talc as a pharmaceutical Excipient: Talc is a naturally occurring mineral that is commonly used in a wide range of industries, including the pharmaceutical industry. In pharmaceuticals, talc is used as a lubricant and diluent in tablet formulations, as well as a glidant in capsule formulations. It is also used as an excipient in topical and oral suspensions, and as a bulking agent in some powders.

6. **Sucrose:-** Sucrose (C12H22O11) is sugar, often referred to as table sugar or saccharose. Commercial

sugar is usually produced from either beet or cane sugar. Sucrose has been used since antiquity for its sweetness. It is often used in medications to impart a more pleasant taste to often unpalatable chemicals. Sucrose can be found in many medical dosage forms such as chewable tablets, syrups, lozenges, or gums. Sugar-free formulations of many of these dosage forms exist as well. While sugar is essentially non-toxic, it can be associated with dental caries, exacerbation of diabetes, and weight gain.

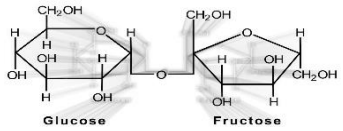

Fig no:- 4

7. **Methyl Paraben:-** Methylparaben is used as an antimicrobial preservative in food, cosmetics, and pharmaceutical formulations. In simple words, the role of methylparaben is to preserve food for a long duration and to protect pharmaceutical products from microbial growth. Any pharmaceutical formulation where we use natural ingredients like sugar or gum acacia may promote microbial growth because natural ingredients are good sources to promote microbial growth to prevent this grown methyl parabenes are used alone or in combination with other parabenes like propylparaben.

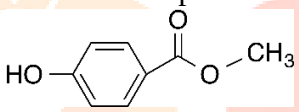

Fig no:- 5

8. **Menthol:-** Menthol is an organic compound that is typically derived from herb plants such as peppermint and eucalyptus. It is a waxy, clear or white crystalline substance, which is solid at room temperature and melts slightly above. Its molecular weight is 156.27and molecular formula is C10H20O.

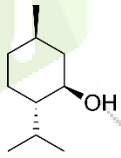

Fig no:- 6

9. **Water:-** Function: Acts as a solvent to dissolve and homogenize all ingredients. Provides the liquid medium for syrup formulation. Role in Syrup: Base solvent for combining all components and ensuring a consistent, drinkable product.

Method of Chewable tablet making

Wet Granulation:- Wet granulation is the most widely used method for granule formation in pharmaceutical manufacturing. This process involves mixing the powder blend with a granulating liquid, followed by wet sizing and drying. The granulating liquid typically contains a volatile solvent, such as water, ethanol, or isopropyl alcohol, which is non-toxic and can be removed during drying. In traditional wet granulation, the wet mass is forced through a sieve to produce wet granules that are subsequently dried.

The wet granulation method was used to create chewable pills. Here, a malaki powder was manufactured originally and it was blended with additives and preservatives. After adding a binding agent to this combination, granules were created, which were then compacted into tablets. procedure of marking

chewable tablet by amla:-

1. Take quantity according to number of tablets to be compressed.
2. All ingredients taken in mortar.
3. converted into a dough mass by Adding 10% Polyvinylpyrrolidone in Ethanol.
4. Dough mass passed through Sieve no.10.
5. Pellet obtain.
6. pellet dried in a Tray drier at 60°c for 15minutes.
7. Dry granules passed through sieve no. 44.
8. then super imposed on sieve no. 22 on a clean filter paper.
9. Granules retain on sieve no. 44 collected & 10% of fines granules.
10. compressed into tablets by tablet making Machine . Benefits of Wet Granulation:

1. Mechanical Handling: Enables mechanical handling of powders without compromising the quality of the blend.
2. Improved Flow Characteristics: Increases particle size and sphericity, enhancing the flow properties of the powder.
3. Enhanced Homogeneity: Improves the uniformity of powder density.
4. Reduced Air Entrapment: Minimizes the amount of air trapped within the powder blend.
5. Increased Cohesion: Enhances cohesion during and after compaction, benefiting overall cohesiveness.
6. Minimized Contamination and Dust: Reduces cross-contamination and the amount of dust produced.
7. Incorporation of Liquids: Allows the integration of a liquid phase into the powder blend.

Tablet testing

1. **Hardness test:-** Tablet hardness test is also known as Crushing Strength Test and is defined as, The test , used for tablets by applying pressure or force to check how much force is required to break the tablets. In simple words, tablet hardness is defined as follows, The breaking force of tablets is known as Tablet Hardness.

Fig no:-7

2. **Friability test:-** Since some high-hardness tablets tend to produce capping or lamination after compression thus tablet hardness is not an absolute indicator of strength. Therefore, friability is another measure of a tablet's strength. In the pharmaceuticals industry often friability test is done to determine the friability of compressed, uncoated tablets, but also to determine the friability of Granules and Spheroids.

Fig no:-8

3. **Disintegration time test:-** This test determines whether dosage forms such as tablets, capsules, boluses pessaries and suppositories disintegrate within a prescribed time (disintegration time) when placed in a liquid medium under the prescribed experimental conditions.

Fig no:- 9

4. **Weight variation:-** Weight variation is a frequently used term during tablet compression operation in pharmaceutical industries. As the name indicates Weight Variation is a defect in which weight differs from the defined ranges given by the official pharmacopoeias. If the weight of tablets is higher than the recommended range then the assay or content uniformity may also be high. & If the weight of tablets is lower than the recommended range then the assay or content uniformity may also be low. So the weight of tablets should carefully be monitored during compression operation. In this article, we will discuss some main reasons which may result in weight variation of tablets during compression operation.

Conclusion:-

Here is an attempt to develop formulation from amla, mint, and milk powder into chewable tablet by weight generation method. Adding menthol to mask the test of chewable tablet also added additives to improve the stability of this tablet.

Result:-

Table no:-1

Test	**Results**
Hardness test	1.6
Friability	0.5%
Disintegration time	20 min
Weight variation time	3%

Table no:-2

Test	Amlakai churna	Amlakai chewable tablet
Odour	Characterstics	Strong
Touch	Smooth	Hard
Colour	Dark brown	Dark brown
Taste	Sour	Sweet

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