



**INTERNATIONAL JOURNAL OF
PHARMACEUTICAL SCIENCES**
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: <https://www.ijpsjournal.com>



Research Article

Research Paper On: Formulation And Evaluation of Nutritional Tablet of Amla for Antioxidant Activity

Tandekar Shruti, Madkar Ketaki*, Meera Deokar

Late Laxmibai Phadatre College of Pharmacy, Kalmab, Walchandnagar, Maharashtra, India.

ARTICLE INFO

Published: 02 May 2025

Keywords:

Amla, Nutrients, Chemical Components, Health Advantages, And the Use of Medications Herbs, Bioactive Ingredients, Pigmentation, Anti-Inflammatory Properties, Antioxidant Activity, Cardiovascular Protection, Hyperlipidemia, Diabetes.

DOI:

10.5281/zenodo.15322095

ABSTRACT

The fruit, also called the Indian gooseberry or amla (*Phyllanthus emblica*), is rich in antioxidants, bioactive substances, and vitamins C and E, making it a good natural remedy for improving skin and hair health. This study examines the potential benefits of chewable amla tablets, focusing on their effects on skin renewal and hair development. Because of its high vitamin C content, amla helps to produce more collagen, make the skin soft, and reduce the appearance of wrinkles, fine lines, and pigmentation. Its antioxidant properties protect the dermis from oxidative damage caused by UV radiation and other environmental pollutants, resulting in a youthful, balanced skin tone. Additionally, amla's antibacterial and anti-inflammatory qualities help to cure conditions like dandruff and dry scalp by strengthening hair follicles, reducing hair loss, and improving scalp health. Preliminary study suggests that frequent use of amla improves skin and hair health, but further scientific studies are needed to determine the optimal dosages, long-term efficacy, and consistency of results. This article demonstrates the great potential of amla digestible tablets as a convenient, natural supplement for enhancing the health of both skin and hair, even though more research is required to fully assess these claims.

INTRODUCTION

The fruit known as the Indian gooseberry, or amla (*Emblca officinalis*), is widely used in traditional medicine, particularly in Ayurvedic treatments. It has been utilized for millennia due to its strong nutritional profile, which includes high levels of vitamin C, flavonoids, polyphenols, and

antioxidants. In recent years, there has been increased interest in amla's potential health benefits, which include its capacity to support immunological function, enhance skin and digestive health, and exhibit robust antioxidant qualities. Amla's traditional use in herbal formulae and raw consumption has been surpassed by the development of more convenient dosage

***Corresponding Author:** Madkar Ketaki

Address: Late Laxmibai Phadatre College of Pharmacy, Kalmab, Walchandnagar, Maharashtra, India.

Email ✉: madkarketaki@gmail.com

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



forms, such as chewable pills. These tablets are specifically designed to deliver the therapeutic benefits of the amla plant in a form that is palatable and easily absorbed. They often contain concentrated amla extract, which effectively increases the bioavailability of its active components. The chewable version of amla tablets has several advantages, including easier administration, faster absorption, and the potential for improved adherence, particularly for those who have difficulty swallowing traditional pills or capsules. Furthermore, by delivering a steady dosage of the fruit's health-promoting components with each meal, these pills usually maintain the natural advantages of amla. In India's tropical and subtropical regions, this fruit is commonly available. It's called Nellikai in Tamil, Avala in Marathi, Nelli in Kannada, and Amalki in Sanskrit. It is a popular medicinal herb in India with many health advantages. Gallic acid, ellagic acid, and rutin are the active ingredients in amla. It has a number of pharmacological qualities, including analgesic, anti-inflammatory, and antioxidant. Nearly every component of this fruit has therapeutic qualities; in particular, the fruit is utilized as a potent rasayana in Ayurveda and in medicine to cure inflammation, jaundice, diarrhea, and a number of other conditions. Amla has antioxidant, heart-protective, and free radical-scavenging qualities. The soluble fiber in amla lowers the risk of irritable bowel syndrome by controlling blood glucose levels and bowel movements. The risk of age-related macular degeneration is decreased by vitamin A content. Amla stops the lens proteins from clumping together and becoming insoluble due to high blood sugar. Phytonutrients and antioxidants aid in the fight against free radicals. Amla's high concentration of polyphenol components gives it antitumor effects. Polyphenols are involved in the pathways linked to inflammation and anti-carcinogenic effects. A high vitamin C content

aids in the body's production of the neurotransmitter norepinephrine, which helps dementia patients' brains work better. Additionally, it works well for anti-aging and is utilized to make skin care products. It aids in the production of collagen protein, which protects skin from damaging UV rays and promotes youthful, flexible skin. Through the stimulation of immune cells and antibodies, it improves immunological function. Amla aids in the removal of toxins and the prevention of fat accumulation. It is used to promote hair growth as a home treatment. Patients with diabetes are using amla fruit as a treatment to prevent the development of neuropathy. Its anti-spasmodic properties aid in the relaxing of stomach muscles and preserve hormonal equilibrium, both of which increase fertility. The current report was created to investigate the fruit's bioactive potential in light of Amla's significance. Growing interest in the health benefits of amla chewable pills has either raised public demand or prompted further scientific investigation. This article aims to provide an evidence-based overview of amla chewable pills' potential to improve health and wellbeing by looking at their pharmacological characteristics, therapeutic applications, and pharmacokinetics.

Amla's function in maintaining healthful skin and hair

The Indian gooseberry, also known as amla (*Emblica officinalis*), has long been valued for its many health benefits, including its positive effects on skin and hair health. Amla's rich nutritional profile, which includes high levels of vitamins C and E, antioxidants, and other essential components, makes it a great natural remedy for maintaining healthy, glowing skin and hair. Amla maintains skin and hair health in the ways mentioned below:



- **Packed with Vitamin C:**

Amla is one of the best natural sources of vitamin C, which is essential for the creation of collagen. Collagen is a crucial protein that preserves your skin's suppleness, flexibility, and shapes.

- **Impact on Inflammation and Antioxidants:**

Amla is a good source of antioxidants and radicals, such as flavonoids, polyphenols, and tannins, which help scavenge reactive oxygen species that can damage skin cells and accelerate aging.

- **Improved Texture and Skin Tone:**

Amla's nutrients help to promote a more even skin tone by lessening hyperpigmentation, black patches, and imperfections. Additionally, amla encourages skin cell renewal, improving the skin's overall appearance and texture.

- **Promotes Hydration:**

Amla's high-water content keeps the skin hydrated, preventing dryness and flakiness and maintaining the skin's natural water balance. Hydrated skin appears plump, silky, and smooth, enhancing its overall health and vitality.

The Ayurvedic description of amla:

The following characteristics of amla fruit are listed in accordance with Ayurvedic classifications:

Rasa (Taste): The fruit contains five tastes, including sweet, bitter, and pungent, but its two main tastes are sour and astringent.

Veerya (Nature): Amla aids in controlling body temperature and treating burning sensations in fever and inflammation, which are thought to be signs of pitta (fire) agitation.

Vipaka, or the taste produced during digestion, is sweet. Guna (characteristics): dry and light Doshas (impact on humors): Amla is particularly good at calming pitta (fire) and all three doshas (vata, kapha, and pitta). Because of this, amla is regarded as one of the best herbs for Ayurvedic rejuvenation. Amla unquestionably has a natural balance of flavors (sweet, sour, pungent, bitter, and astringent), which encourages the brain to regulate the body's three primary components—fire, water, and air—for all physiological processes. According to Ayurveda, Amla is one of the most effective Rasayanic tonics for brightening the appearance of the skin purifying the blood, and improving vision. The medicinal qualities of amla are defined in the following shloka:

*हरीतकीसमं धात्रीफलं किन्तु विशेषतः। रक्तपित्तप्रमेहघ्नं
परं वृष्यं रसायनम्। हन्ति वातं तदम्लत्वात्पित्तं
माधुर्यशैत्यतः। कफ*

*रूक्षकषायत्वात्फलधाज्यास्त्रिदोषजित्। यस्य यस्य
फलस्येह वीर्यं भवति यादृशम्। तस्य तस्यैव वीर्येण
मज्जानमपि निर्दिशेत्।*

Need for Study:

1. Growing Demand for Herbal Supplements: As people become more conscious of the benefits of natural and herbal therapies, there is a growing need for herbal and Ayurvedic supplements, particularly those made from amla.
2. Amla's Health Benefits Amla (*Embolica officinalis*) is high in antioxidants, polyphenols, and vitamin C, which improve digestion, increase immunity, and have anti-aging properties.
3. Standardized Dosage: Unlike raw fruit or powder, which can vary in dosage, amla tablets provide a precise and controlled dose of active components.
4. Longer Shelf Life: Tablets have a longer shelf life than fresh Amla or Amla juice, making them



appropriate for bulk production and commercial distribution.

5. Growing Health Issues: Modern lifestyle diseases such as hyperlipidemia, oxidative stress-related ailments, and decreased immunity illustrate the importance of natural antioxidants such as amla.

6. Convenience Over Traditional Forms: Amla is frequently consumed fresh, juiced, or powdered, which may not be convenient for many people. Tablets offer a convenient, portable, and reliable dosing form.

Objective of Study:

- 1. Formulation of Amla Tablets:** Create a stable and effective tablet formulation utilizing Amla extract or powder.
- 2. Physicochemical Property Assessment:** To verify tablet quality, characteristics such as weight variation, hardness, friability, and disintegration time are evaluated.
- 3. Improving Bioavailability:** Studying excipients and formulation strategies to improve the absorption and efficacy of Amla's active components.
- 4. Standardization of Active Ingredients:** To ensure consistency in vitamin C concentration and antioxidant activity in each tablet.
- 5. Stability Studies:** Determine the shelf life of the prepared Amla tablets under various storage settings.
- 6. Safety and Efficacy Testing:** To assess the potential health benefits and safety of the prepared Amla pills using relevant in vitro or in vivo tests.
- 7. Comparative Study with Marketed Products:** To assess the efficacy, stability, and quality of the proposed formulation against existing marketed Amla tablets.

Drug Content Profile:

- 1. Amla:**



Classification-

Kingdom: Plantae
Phylum (Division): Tracheophyta
Class: Magnoliopsida
Order: Malpighiales
Family: Phyllanthaceae
Genus: Phyllanthus
Species: Phyllanthus emblica

Synonyms: Emblica, Indian goose berry, amla.

Biological Source:

This consists both dried, as well as fresh fruits of the plant *Emblica officinalis* Gaerth (*Phyllanthus emblica* Linn.), which belongs to family Euphorbiaceae.

Morphological characteristics:

Colour: Green changing to light yellow or Brick red when matured.

Odour: Slightly sour.

Taste: Sour and astringent.

Shape: The fruit are depressed and globose.

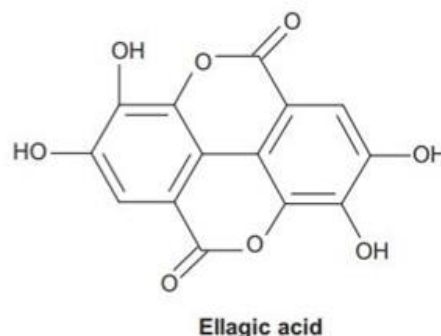
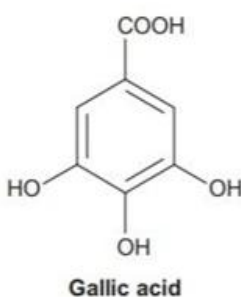
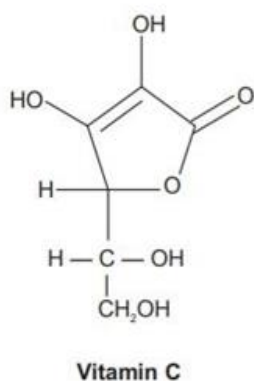
Extra features: Fruit are fleshly obscurely four-lobed with 6-trygonus seed and they're Very hard and smooth in appearance.

Size: 1.5 to 2.5 cm in diameter

Chemical Constituents:

It is extremely nutritious and a good source of vitamin C, minerals, and amino acids. In comparison to the apple, the edible fruit tissue contains three times as much protein and 160 times as much ascorbic acid. The fruit also has a far higher concentration of most nutrients and amino acids than apples. The pulpy component of the fruit, dried and separated from Anti-inflammatory action. *Emblica officinalis* extracts were studied,

and the results showed that the water part of the leaves' methanolic extract has anti-inflammatory effect. The fraction's effects were investigated on inflammation mediators such as platelet-activating factor, thromboxane B₂, leukotriene B₄, LTB₄-, and migration of human polymorphonuclear leucocytes produced by N-formyl-L-methionyl-L-leucyl-L-phenylalanine. The water fraction of the methanolic extract impeded human.



Uses:

1. Anti-inflammatory activity:

Emblica officinalis extracts were studied, and the results showed that the water part of the leaves' methanolic extract has anti-inflammatory effect.

2. Anti-Cancer Activity:

Amla reduces the growth and spread of diseases such as breast, uterine, pancreatic, stomach, and liver cancer. It can avoid or decrease the negative effects of chemotherapy and radiotherapy [125].

3. Action on diabetes:

Amla fruit powder can help to reduce high blood pressure. Amla enhances insulin sensitivity and glucose metabolism, which lowers blood sugar levels. Beneficial for controlling Type 2 Diabetes Mellitus.

2. Respiratory Disorder:

Amla has been shown to restore regular breathing even when the system is damaged. The paste is created by crushing 10gm of *Phyllanthus emblica*

leaves, 5 fruits of *Terminalia chebula*, 9 seeds of *Piper nigrum*, and one garlic and mixing with 25 ml of cow's milk ghee and a clove. Fresh Amla juice blended with honey can help you recover from asthma, coughs, and other respiratory diseases.

5. Antihyperlipidemic Activity

It reduces total cholesterol, LDL (bad cholesterol), and triglycerides while raising HDL (good cholesterol). It is Useful for preventing atherosclerosis and cardiovascular disease.

6. Hepatoprotective Activity:

It protects the liver from harmful substances (such as alcohol, narcotics, or pollution). It also Improves liver function and improves detoxification.

7. Immunomodulatory Activity:

It enhances immune response by stimulating white blood cells and gives Protection against bacterial, viral, and fungal infections.

8. Gastroprotective Activity.

Increases mucus secretion and minimizes acidity, which helps to prevent stomach ulcers and reflux and has beneficial activity against peptic ulcer illness and gastritis.

Antioxidant properties of Amla:

The building blocks of all biological reactions are free radicals, which are continuously produced by the body's normal use of oxygen. Naturally, there is a dynamic equilibrium between the body's production of free radicals and the quantity of antioxidants that are available to scavenge, quench, and protect the organism from their damaging effects. A traditional Indian remedy that contained *Emblica officinalis* was created and used as a health tonic; it demonstrated potent antioxidant properties. Antioxidants found in *Emblica officinalis* are water soluble and heat stable, however they are only partially extractable with ether. Oxidative activities can damage the body's basic cells, even though they are essential for survival. Amla increases antioxidant levels and reduces the production of free radicals, which enhances cell viability. Nature has produced many enzymes, including glutathione (GSH), catalase (CAT), peroxidase, superoxide dismutase (SOD), and other complex antioxidant defense mechanisms, including vitamins A, C, and E, to counteract oxidative damage. Reactive oxygen species (ROS) and lipid hydroperoxide were shown to significantly decrease in a study that incubated *E. officinalis* for 24 hours. Additionally, *E. officinalis* increased antioxidant enzyme activity, glutathione peroxidase (GSH) levels, and antioxidant capacity. Additionally, the active tannoids of *E. officinalis* reduced lipid peroxidation in the frontal and striatal cortex and enhanced the activities of catalase (CAT), superoxide dismutase (SOD), and GSH peroxidase (GPX) when administered once daily for seven days. With IC₅₀ values (the lowest drug

concentration required to produce 50% inhibition in vitro) of 6 g/ml and 13 g/ml for DPPH radical scavenging activity, respectively, the pulp of *E. officinalis* exhibits greater antioxidant capability than the seeds. Emicinin A and B, which are found in amla fruit, are said to have strong antioxidant properties. Amla improves cell viability by increasing antioxidant levels and reducing the formation of free radicals. The results also imply that tannoids, which are not vitamin C but have properties similar to them, may be the source of *E. officinalis*' antioxidant action. According to a different study, amla's phytochemicals can function as a superior metal ion chelator, stopping oxidative cascades. The antioxidant activity of Amla's tannoid active ingredients, emblicanin A and B (37% & 33%, respectively), punigluconin (12%), and pedunculagin (14%), was assessed in a rat model.

Production process:

MATERIALS:

The primary component for this study were dried powder form of Amla. The The materials (reagents)we have used to make an amla tablet are Microcrystalline Cellulose (Binder & Filler) , Starch (Disintegrant),Magnesium Stearate (Lubricant),Talc (Glidant),PVP (Polyvinylpyrrolidone, as a Binder), Water(for Granulation)q.s.

Instruments: the main equipments are temperature Drying oven, ultra fine grinder, vibrating sieve machine, mixer constant temperature and humidity chamber,electronic balance, tablet tester, crushing tester, intelligent disintegration tester and rotary tablet machine.

METHOD:



1. Making a fine powder of *Emblica officinalis* (Amla):

- Choose fresh, ripe, and healthy Amla fruits.
- Wash them thoroughly with clean water to remove dirt and impurities. Allow them to air dry or pat them dry with a clean cloth. Now, Cut the Amla into small pieces to speed up the drying process.
- Spread the Amla slices on a clean tray and Dry under direct sunlight for 5–7 days until completely moisture-free. Cover them with a fine mesh to protect from dust and insects. OR Place the slices

in an oven at 50–60°C for 8–12 hours. Check periodically to prevent overheating.

-Once fully dried, grind the Amla using a grinder or pulverizer for a fine powder. A mortar and pestle can be used for small quantities.

-Use a 100–200 mesh sieve to filter out coarse particles.

-Regrind larger particles and sieve again for uniformity.

-Store the fine Amla powder in an airtight container.

-Below table shows the percentage of each tablet's components and Additions.



Ingredients	Quantity per tablet (mg)	Total for 100 tablet	Purpose
Amla powder	250 mg	25 g	Active ingredient (antioxidant and immunity Booster)
Microcrystalline cellulose (MCC)	100 mg	10 g	Binder and filler
Lactose monohydrate	30 mg	3 g	Filler
Magnesium Stearate	5 mg	0.5 g	Lubricants
Mannitol	60 mg	6 g	Filler and sweetening agent
Talc	10 mg	1 g	Glidant
Sodium starch glycolate	20 mg	2 g	Disintegrant
Silicon Dioxide	5 mg	0.5 g	Flow promoter
PvP k30 (Polyvinylpyrrolidone K30)	50 mg	5 g	Binder

2. Granulation method:

(Wet granulation method) –

-in this process mixing of dry ingredients takes place.

-In a blender, combine amla powder , MCC, and sodium starch glycolate, mannitol and lactose monohydrate for 10 minutes.

-After that binder is prepared by dissolving PVP K30 (2 g) into q.s. water to form 5-10% of solution.

-Add the PVP solution to the powder mixture gradually, stirring until it forms a wet mass.

- Pass a wet mass through sieve #16 to get granules.

-Dry the granules at 50–60°C for 30–45 minutes (moisture content <2%).

-Pass dried granules through sieve #40 for uniform size distribution

-Add Talc & Magnesium Stearate and silicone dioxide to the dried granules and Blend for 2–5 minutes in blender. then allow it for compression. Now compress the Granules into Tablets.

Pre-formulation study:

1) Bulk Density: Bulk density is the ratio of the mass by the volume of an untapped powder sample. The bulk density is measured in g/ml. The bulk density depends on both the density of the powder particles and the arrangement of the powder particles.

The bulk density influences preparation, storage of the sample.

The mathematical re-presentation is given below-

Bulk density = Weight of the drug / Bulk volume.

2) Tapped Density: In tapped density, the bulk powder is mechanically tapped in a graduated cylinder until the volume change is observed. Here the tapped density is calculated as mass divided by the final volume of the powder.

Tapped density = weight of the granules / Tapped volume

3) Angle of Repose: It gives an idea of the flow ability of granules or a bulk solid. There is some factor which responsible for the flow ability of powders such as particle size, shape, surface area, etc. The flow ability of the powder depends on the different environments and can be changed easily.

The angle of repose was calculated by the following formula: -

$$\theta = \tan^{-1}(h/r)$$

Where,

θ = angle of repose

h = Height of the formed cone,

r = Radius of the circular base.



4) Carr's Index: - It is an indicator of the compressibility of a powder. It is one of the most important parameters to characterize the nature of granules.

Car's index (%)=(Tapped density – Bulk density/Tapped density) x 100.

$$HR=pt/pb$$

Where,

HR-Hausner Ratio

Pt = tapped density and

pb = bulk density.

5)Hausner ratio: Hausner Ratio (HR) is an indirect index of ease of powder movement. It was calculated by the following formula,



Lower Hausner ratio (<1.25) designates better movement proper than higher ones (>1.25).

Characterization Of Blend Formulation:

Formulation	Bulk Density (g/cm)	Tapped Density (g/cm)	Carr's index (%)	Hausner Ratio	Angle of Repose (°C)
F1	0.40	0.50	20.83	1.25	36.87
F2	0.40	0.54	19.23	1.26	36.40
F3	0.42	0.50	20	1.22	31.40

Evaluation test of tablet:

The Nutritional tablet of amla were evaluated by following parameters:

Hardness:

Hardness was determined by using Monsanto hardness tester. Hardness of these tablets from each batch of different formulation was tested.

Operating Procedure: -

1. Place the sample tablet in the vertically holding edges of the anvil of Monsanto Hardness Tester.
2. Adjust the pointer at zero position on the scale by rotating the screw in forward direction.
3. Now rotate the screw till break point of the tester.
4. The breakage of tablet shows hardness on the scale.
5. Repeat the procedure 5-6 times for average reading. Record the observation.



2. Friability:

Procedure of friability apparatus: -

- 1) Deduct tablets & weigh accurately required number of tablets
- 2) then place the tablets in drum & allow it to rotate for 100 times resolutions
- 3) After completion of 100 revolutions, remove the tablet weigh.
- 4) If then calculate of observation of test.

Note: A maximum loss of weight not greater than 1% is acceptable.



3.Thickness:

Micrometer was used to measure the thickness of the tablet a done in case of conventional tablets 10

tablets were aimlessly selected to perform the process. Thickness was measure by Vernier-calliper scale in triplicate manner.

4.Weight Variation:

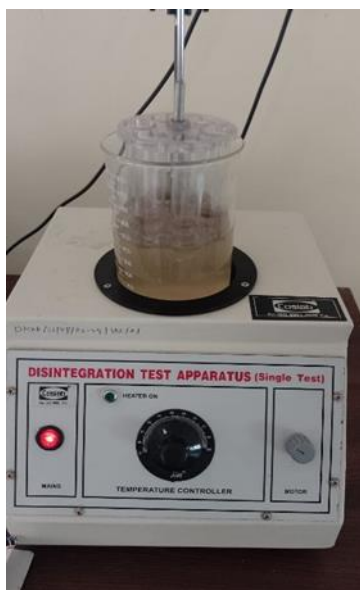
Weight variation test is also known as uniformity of weight, it is the official quality control test which is performed to ensure that each tablet dosage form has the accurate amount of drug.The test is conducted by weighing 20 tablets individually on an analytical balance computing the average weight, and comparing the individual weights of the tablet to the average



5.Disintegration Test:

Disintegration test was performed by introducing one tablet in each tube and then suspending the

basket assembly in a beaker containing purified water and operating the apparatus until tablet disintegrates complete.



RESULT: -

- In the present work. Evaluation of Nutritional tablet of Amla.
- In studies were carried to find out nutritional benefits of amla nutritional tablet.
- The hardness of tablet was determined and found in the range of 5 kg/cm²
- The Disintegration time of tablet was found to be 14 min
- The friability of nutritional tablet was found to be 0.57%
- The thickness was found to be 4 mm

The formulation of nutritional tablets containing amla was successful, with the tablets exhibiting desirable characteristics such as appearance, weight variation, hardness, friability, and disintegration. The pre-formulation studies showed that the bulk density, tapped density, angle of repose, Carr's index, and Hausner ratio were within acceptable ranges, indicating good flow properties of the granules. The characterization of blend formulations also confirmed the suitability of the powder blend for tablet compression.

Sr.no.	Test	Result
1	Friability Test	0.57

2	Disintegration Test	14 min
3	Hardness Test	5 kg/cm ²
4	Thickness Test	4 mm
5	Diameter	1 cm



Result & pre-formulation study of Drug:

1.Organoleptic properties:

The sample obtained was found to be

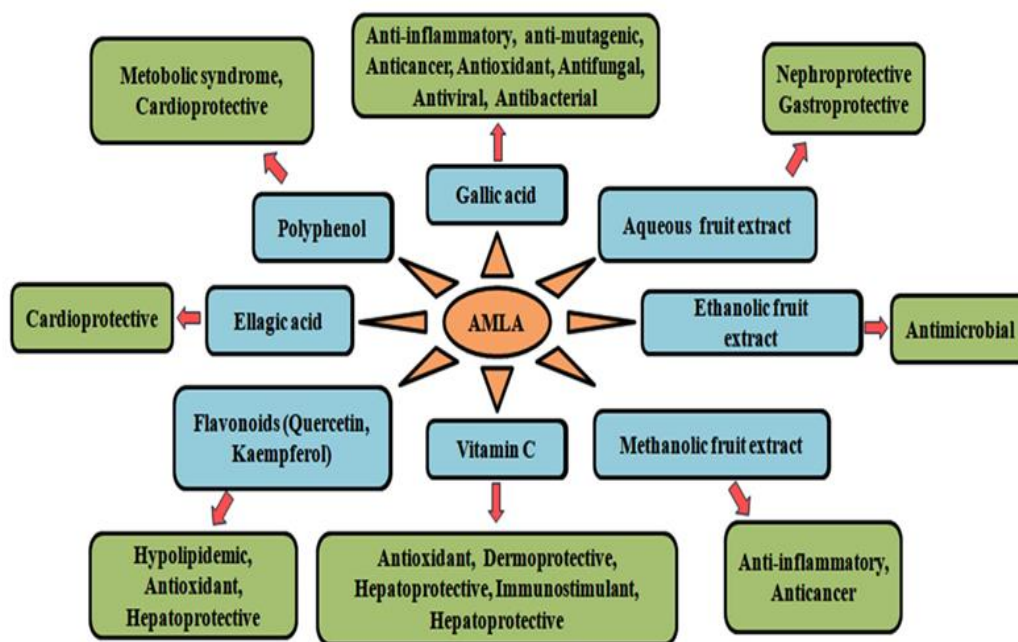
Sr.no.	Parameter	Observed Result	Reported standard
1	Colour	Light brown or beige	Light brown or beige
2	Odour	Slightly sour	Slightly sour

3	Characteristics	Non-Crystalline	Non-Crystalline
---	-----------------	-----------------	-----------------

3.	Water	Partial Solubility
----	-------	--------------------

Uses:**Solubility of drug:**

Sr.no.	Solvent	Result
1.	Ethanol	Good solubility
2.	Methanol	High solubility

**Dosage:**

- 1) This tablet is taken twice a day i.e in the morning and once in the evening.
- 2) Use lukewarm water or honey to improve the Absorption, generally after meals in order to avoid Acidity.
- 3) It can be taken for 3-6 months for chronic oxidative Stress.

CONCLUSION:

Amla (*Phyllanthus emblica*) has anti-oxidant, vitamin C, and anti-inflammatory properties, making it a promising natural remedy for enhancing skin and hair health.

It can reduce aging symptoms, enhance skin tone, boost collagen formation, and reduce inflammation and pigmentation. Flavonoids and

polyphenols are powerful antioxidants that protect skin from UV radiation, pollution, and premature aging by reducing oxidative stress and environmental damage. Consistent usage of amla tablet may reduce aging symptoms, enhance skin tone, increase collagen formation, and reduce inflammation and pigmentation. Flavonoids and polyphenols are powerful antioxidants that protect the skin from harmful UV radiation, It also prevent oxidative Stress. Whereas clinical data supports the benefits of amla in tablet form for hair and skin, the effectiveness of these supplements may vary based on dosage, formulation, and individual response. More extensive clinical trials are needed to determine the long-term benefits of amla supplementation and the optimal dosage for specific outcomes. These tablet enhances the health of skin and hair .To achieve the best results, skincare and haircare treatments should be

combined with a healthy diet, adequate water intake, and a balanced lifestyle. More research is needed to completely understand the curative qualities of amla in trichology and dermatology, as well as establish universal standards.

REFERENCES

1. Ai Ram M., et al. "Cytoprotective activity of Amla (Emblca of-Ficinalis) against chromium (VI) induced oxidative injury in Murine macrophages". *Phytotherapy Research* 17 (2003): 430-433.
2. Singh I., et al. "Radioprotection of Swiss albino mice by Emblica Officinalis". *Phytotherapy Research* 19 (2005): 444-446.
3. Zhang LZ, Zhao WH, Guo YJ, Tu GZ, Lin S, Xin LG, Studies on Chemical constituents in fruits of Tibetan medicine Phyllanthus Emblica, *ZhongguoZhong Yao ZaZhi*, 28(10), 2003, 940-3.
4. Krishnaveni M, Mirunalini S, Therapeutic potential of Phyllanthus Emblica (amla): the ayurvedic wonder, *Journal of Basic and Clinical Physiology and Pharmacology*, 21, 2010, 93-105.
5. Sankaran M, Velusamy V, Mani K, Amla: a novel ayurvedic herb as A functional food for health benefits" – A mini review, *International Journal of Pharmacy and Pharmaceutical Sciences*, 5(1), 2013, 1-4.
6. Khan KH, Roles of Emblica officinalis in Medicine – A Review, *Botany Research International*, 2 (4), 2009, 218-228.
7. Sampath Kumar KP, Bhowmik D, Dutta A, Yadav A, Paswan S, Shweta S, Lokesh D, Recent Trends in Potential traditional Indian Herbs Emblica Officinalis and Its Medicinal Importance, *Journal of Pharmacognosy and Phytochemistry*, 1(1), 2012, 24-32.
8. Singh E, Sharma S, Pareek A, Dwivedi J, Yadav S, Sharma S, Phytochemistry, traditional uses and cancer chemopreventive Activity of Amla(Phyllanthus emblica): The Sustainer, *Journal of Applied Pharmaceutical Science*, 2(1), 2011, 176-183.
9. Linda T, Amla Traditional food and medicine, *Herbal Gram*, The Journal of the American Botanical Council, 31(26), 1994.
10. Kumar A, Singh A, Dora J. Essential perspectives for Emblica Officinalis, *International journal of pharmaceutical and chemical Sciences*, 1(1), 2012, 11-18.
11. Shweta K, Sunny S, A short description on pharmacogenetic Properties of Emblica officinalis, *Spatula DD*, 2(3), 2012, 187-193.
12. Prakash D, Upadhyay G, Pushpangadan P, Gupta C, Antioxidant And free radical scavenging activities of some fruits, *Journal of Complementary and Integrative Medicine*, 8(1), 2011, 1-16.
13. Soni, R. A., Sudhakar, K., & Rana. R. S. (2017). Spirulina-From growth to nutritional product: A review. *Trends in food science & technology*, 69, 157-171.
14. Saranraj. P. and Sivasakthi, S., 2014. Spirulina platensis-food for future: a review. *Asian J. Pharm. Sci. Technol*, 4(1), pp.26-33.
15. Ali, S.K. and Saleh, A.M., 2012. Spirulina-an overview. *International Journal of Pharmacy and Pharmaceutical Sciences*, 4(3), pp.9-15.
16. Andrade, L.M., Andrade, C.J., Dias, M., Nascimento, C. and Mendes, M.A., 2018. Chlorella and spirulina microalgae as sources of functional foods. *Nutraceuticals, and Food Supplements*, 6(1), pp.45-58.
17. Moes, J.J., Ruijken, M.M., Gout, E., Frijlink, H.W. and Ugwoke, M.I., 2008. Application of process analytical technology in tablet process development using NIR spectroscopy: Blend



- uniformity, content uniformity and coating thickness measurements. *International journal of pharmaceutics*, 357(1-2), pp.108-118
18. *The Ayurvedic Pharmacopoeia of India, Part I, Volume II* This official publication provides standards for single drugs used in Ayurveda, including Amla (*Embllica officinalis*).
 19. *The Theory and Practice of Industrial Pharmacy* by Lachman and Lieberman (3rd Edition) A foundational text in pharmaceutics, detailing principles of tablet formulation and manufacturing.
 20. *Aulton's Pharmaceutics: The Design and Manufacture of Medicines* (5th Edition) This book offers comprehensive insights into pharmaceutical formulation and manufacturing processes.
 21. *International Journal of Pharmaceutical Sciences and Research (IJPSR)* A peer-reviewed journal publishing research on pharmaceutical sciences, including herbal formulations.
 22. *Journal of Ayurveda and Integrative Medicine (J-AIM)* An open-access journal focusing on integrative health sciences, bridging Ayurveda and modern medicine.

HOW TO CITE: Tandekar Shruti, Madkar Ketaki*, Meera Deokar, Research Paper On: Formulation and Evaluation of Nutritional Tablet of Amla for Antioxidant Activity, *Int. J. of Pharm. Sci.*, 2025, Vol 3, Issue 5, 123-137 <https://doi.org/10.5281/zenodo.15322095>

