

Amla: A Nature’s Miracle

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Abstract:

EmblicoefficialisGaertn., sometimes known as Indian gooseberry or Amla/ Aonla, or *Phyllanthusemblica* Linn. the Indian medical system makes extensive use of amla (Ayurveda, Unani, and Siddha). It is the first tree to have been formed in the cosmos, according to ancient Indian mythology. It belongs to the Euphorbiaceae family. It is the richest source of vitamin C found in nature. Alkaloids, phenolic substances, amino acids, and carbohydrates make up the majority of the ingredients in *Emblicoefficialis* (EO). The most vitamin C, elagic acid, chebulinic acid, quercetin, chebulagic acid, emblicanin-A, emblicanin-B, gallic acid, ascorbic acid, etc. are found in its fruit juice. Amla is a plant that has medicinal properties in all of its components, but the fruit is the most crucial one. In the Indian system of medicine, amla fruit is frequently used as a diuretic, laxative, liver tonic, refrigerant, stomachic, restorative, anti-pyretic, hair tonic, and ulcer preventative; either alone or in conjunction with other herbs. The fruit is a key ingredient in various Ayurvedic remedies that support health and life, including Chyavanprash and Rasayana. Regular usage of amla boosts defences and fights againstdisease chronic illnesses including cancer, hypertension, high cholesterol, diabetes, influenza, chronic cough and colds, infections, chronic tiredness, and chronic inflammatory problems. Amla is regarded by Ayurveda as one of the greatest medicines for treating diabetes, clotting issues, and promoting strength and endurance. *E. officinalis* is also appropriate for use in sunscreen, anti-aging, and all-purpose skin care products. It has anti-inflammatory, antipyretic, analgesic, cytoprotective, antitussive, gastroprotective, wound-healing, immunomodulatory, adaptogenic, cardioprotective, nephroprotective, hepatoprotective, and antidiarrheal effects. A hair tonic can also be made from it. Its uses in improving memory, treating ophthalmic conditions, lowering cholesterol, preventing peptic ulcers, treating anaemia, etc. Included are the effects of EO as an antibacterial and in neutralising snake venom.

Keywords —Emblicoefficialis, Indian gooseberry, amla fruit, vitamin C and ascorbic acid.

I. INTRODUCTION

Amla

Aonla belongs to the Euphorbiaceae family includes the ephemeral tree *Phyllanthusemblica L.*, also known as amla or Indian gooseberry. Amla fruits are generally found in India, Pakistan, China, Iran, and Southeast Asia [52,28]. In Indian traditional medicine, amla plays a significant role in reducing anxiety and burning sensations in the skin and eyes, enhancing anaemia, favouring the health

of the male reproductive system and reproduction, improving liver health, facilitating digestion, and having a tonic effect on the cardiovascular system [72]. Nature has given humans amla as a gift. It is a vital component of the ayurveda and unani systems and possesses incredible therapeutic powers. It is referred to as Amalaki or Dhartiphala in Sanskrit. The herb amla may be the one that is cited the most in the Ayurvedic medical text "CharakSamhita." Amla is a miracle plant and one of nature's most

priceless gifts to people. In Sanskrit, amla is referred to as "Divya" and "Amrut" or AmritPhala, which literally translates to "fruit of heaven" or "nectar fruit." The word Amlaki, which means "the sustainer" or "the fruit where the goddess of prosperity resides," is Sanskrit. Hindu religious mythology reveres the tree as the Earth Mother because its fruit is so nutritious that it serves as humanity's nurse [45]. One of the most well-liked botanicals, *P. emblica* L.'s fruit has a variety of uses in the health, culinary, and cosmetic fields. According to ancient Indian mythology, this is the first tree to have been "created in the cosmos" [50]. It is a fantastic dietary supplement with a number of health advantages [32]. Emblic fruit might be viewed as a plant source for natural antioxidants and nutraceuticals or therapeutic components because of the high concentration of phenolic compounds in the fruit. Customers enjoy Emblic fruit for its distinct flavour and lovely aroma. Amla has been shown to have anti-hyperglycemic, hypoglycemic, anti-inflammatory, anti-hyperlipidemic, and antioxidant effects in several animal and human studies [72]. As a result of its abundance in antioxidants including gallic acid, ascorbic acid, and phenolic compounds, amla supports the body's immunological and digestive systems [30].

Table 1: Plant anatomy

S. No.	Particular	Details
1.	Kingdom	Plantae
2.	Division	Flowering plant
3.	Class	Magnoliopsida
4.	Order	Malpighiales
5.	Family	Phyllanthaceae
6.	Tribe	Phyllanthaeae

II. CHEMICAL COMPOSITION OF AMLA

The nutritional benefits of amla are widely established. It is high in polyphenols, minerals, and is one of the best sources of vitamin C (200900 mg

per 100 g of edible part) [26,11]. The following are the most important dietary components:

Table 2: Chemical components and their percentage

Chemical components	Percentage
Moisture content	81.2
Protein content	0.5
Fat content	0.1
Mineral matter	0.7
Fibre content	3.4
Carbohydrates	14.1

Source: [23]

III. MORPHOLOGICAL CHARACTERISTICS

The amla tree is a small to medium-sized deciduous tree that typically grows to a height of 8 to 18 metres. Its thin, light-grey bark exfoliates in tiny, uneven flakes, revealing the younger, lighter-coloured surface underneath the older bark. The main stem is about 70 cm in diameter. The main stem is typically split into two to seven scaffolds very close to the base [46]. The leaves are densely arranged in pinnate fashion and are 10–13 mm long by 3 mm broad, giving the branches a fluffy look. The leaves of the fruit grow after it has set. Flowers are unisexual, 4 to 5 mm long, pale green in colour, and borne on leaf axils in clusters of six to ten [44]. Fruits have a fleshy, almost globose form, a diameter of 2.1–2.4 cm, a weight of 5.3–5.7 g, and a volume of 4.5–5.0 mL. The fruit's stone has six ribs and splits into three segments with typically two seeds each. These seeds are 4-5 mm long and 2-3 mm broad and weigh 572–590 mg apiece [59].

IV. TRADITIONAL USES

Amla is regarded as a potent rejuvenator and useful in postponing the ageing and degenerative processes. *E. officinalis* is used in Chinese, Sri Lankan, Siddha, and Unani Tibetan medicine. This aids in digestive improvement and constipation relief. The Ayurvedic medical system states that EO considerably lowers fever, inflammation, blood purification, heart health improvement, benefits vision, promotes hair development, strengthens the body, reduces asthma, and enhances mental

capacity. Anemia, hematuria, diabetes, asthma, osteoporosis, gastritis, premature hair greying, dyspepsia, colitis, haemorrhoids, constipation, cough, and fatigue are all treated with astringent fruits in many traditional treatments. The anti-inflammatory, diuretic, laxative, cardioprotective, antipyretic, and hepatoprotective activities of *E. officinalis* were investigated. Additionally, it has been claimed that EO works well for treating gastric ulcers and as a digestion and hair tonic [7].

V. PRODUCTS OF AMLA

Amla fruit

Amla fruit is roughly spherical in form, 18-25 mm wide, and has 15 layers of yellow pericarp (i.e., mesocarp) whereas the endocarp turns yellowish-brown when mature. The mesocarp of fresh Amla fruit has a sour flavour, however it has a puckery taste in dried fruit (20 mm in length). And ripen between November and February. It has a smooth surface with six hazy vertical lines. The middle Amla leaves are >8-10 mm long and 2-3 mm wide. They are hairless, light green on the outside and pale green or frequently pubescent on the inside, and are often used as a meal for catles.

Amla oil

Its fat and oil are mostly sourced from Amla seeds and fruits, and it is golden yellow-light brown in hue. It has a mild, sweet, and nutty aroma. It is a moisturising oil with a medium viscosity.

Amla seeds

Each fruit has 4-6 seeds that are silky to the touch and dark brown in colour. They are a more reliable source of Amla oil. Asthma and bronchitis are routinely treated with amla seeds.

Amla bark

Amla extract

It is usually gray-brown or gray-green in hue and around 12 mm thick. The antiviral activity of amla fruit extract produced by alcoholic extraction is particularly effective.

VI. PHARMACOLOGICAL ACTIVITIES AND MECHANISMS

Disease is caused by a disruption in the body's basic homeostatic equilibrium. The bulk of diseases are caused by an imbalance in pro-oxidant and anti-

oxidant equilibrium. Pro-oxidant conditions predominate owing to increased free radical formation and/or inadequate quenching/scavenging by anti-oxidants (which protect the organism from the harmful effects of free radicals) [49]. Amla is high in vitamin C and low molecular weight hydrolysable tannins, making it an excellent antioxidant. The tannins in amla, such as emblicanin-A (37%), emblicanin-B (33%), punigluconin, and pedunculagin, have been shown to protect against oxygen radicals in rat peripheral blood erythrocytes [21]. The recycling of the sugar moiety and conversion of the polyphenol into medium and high molecular weight tannins are the mechanisms underlying antioxidant action. Ellagic acid, a potent antioxidant found in Amla, can suppress gene mutations and repair chromosomal defects. (Pandey, 2011) Amla prevents the spread and development of different malignancies.

VII. PHYTOCHEMISTRY OF AMLA

Amla has been discovered to have abundant phytochemistry spread throughout the plant (fruits, leaves, and roots). Polyphenols are the most common type of secondary metabolite, with many substances from phenolic acids, flavonoids, tannins, and other phenolics and derivatives being described in various investigations. Ascorbic acid, coumaric acid, gallic acid, protocatechuic acid, syringic acid, and vanillic acid. In terms of phenolic acids, the presence of hydroxybenzoic acids (4-hydroxybenzoic acid, coumaric acid, gallic acid, protocatechuic acid, syringic acid, and vanillic acid) was found in fresh fruit and commercial goods manufactured from the fruits [9,10, 39]. The only hydroxybenzoic acid found in leaves and branches is gallic acid [76]. Only amla fruits contained hydroxycinnamic acids (caffeic acid and chlorogenic acid) [9,10,40]. Flavonoids are another family of chemicals found in the amla plant (particularly flavanols, flavones, flavanones, and flavan-3-ols). Flavanols are found in high concentrations throughout the amla plant. Kampferol and its derivatives (dihydrokaempferol, kaempferol 3-b-dglucopyranoside, kaempferol 3-orhamnoside, kaempferol-3-o-l-(6"-ethyl)-

rhamnopyranoside, and kaempferol-3-o- -1-(6"-methyl)rhamnopyranoside. Similarly, quercetin and its derivatives (quercetin 3-b-D-glucopyranoside, quercetin 3-O-glucoside, quercetin 3-O-rhamnoside, and rutin) are found in fruits, leaves, and branches [9,10,39]. In terms of flavones, the presence of apigenin, luteolin, and myricetin was found in fresh fruits and fruit commercial goods [40]. Myricetin 3-O-rhamnoside has only been found in the leaves and branches of the amla tree. Interestingly, flavanones and flavan-3-ols were exclusively found in leaves and branches [77]. The flavanones found were eriodictyol, naringenin, and their derivatives ((S)-eriodictyol 7-O- (6"-O-galloyl)). - -D-glucopyranoside, (S)-eriodictyol 7-O-(6"-O-trans-p-coumaroyl) - -Dglucopyranoside, naringenin 7-O-(6"-O-galloyl) -glucoside, naringenin 7-O-(6"-O-trans-pcoumaroyl)-glucoside, and naringenin 7-O-glucoside). Epigallocatechin, epigallocatechin 3-O-gallate, and galocatechin were the flavan-3-ol molecules found. Tannins are yet another important phenolic component present in amla fruits, leaves, and branches. Many investigations have found ellagitannins such chebulinic acid, chebulagic acid, corilagin, emblicanin A and B, geraniin, isocorilagin, pedunculagin, phyllanemblinins A-F, and punigluconin [48,34,76]. Ellagic acid and its metabolites (decarboxyellagic acid and 3-O-methylellagic acid 4-O-L-rhamnopyranoside) have also been found in fruits, leaves, and branches [77]. Amla leaves and branches are rich in hydrolysable tannins (1,2,3,4,6-penta-O-galloyl-D-glucose, 1,2,3,6-tetra-O-galloyl- -D-glucose, and 1,2,4,6-tetra-O-galloyl- -D-glucose) and phlorotannins (2-(2-methylbutyryl). Tannic acid, which has been found in amla fruit, is an exception. Amla fruit also included additional phenolics (2,4-di-tert-butylphenol and Phenol, 3,5-bis (1,1-dimethylethyl)) [2]. Alkaloids (particularly phyllantine and phyllantidine) have also been found in amla [31].

Table 3: Chemical Components present in Amla

Type	Chemical constituents
Hydrolysable tannins	Emblicanin A and B, pedunculagin, chebulinic acid, (benzopyran tannin), corilagin, and geraniin
Alkaloids	Phyllantine, phyllembein, and phyllantidine
Phenolic compounds	Galic acid, methyl gallate, ellagic acid, and trigalloyl glucose
Amino acids	Glutamic acid, proline, aspartic acid, alanine, cystine, and lysine
Carbohydrates	Pectin
Vitamins	Ascorbic acid
Flavonoids	Quercetin and kaempferol
Organic acids	Citric acid

Source: [57]

VIII. THE AYURVEDIC DESCRIPTION OF AMLA

According to Ayurvedic classifications, the fruit has the following properties:

- Rasa (taste): sour and astringent are the most dominant, but the fruit has five tastes, including sweet, bitter, and pungent
- Veerya (nature): cooling
- Vipaka (taste developed through digestion): sweet
- Guna (qualities): light, dry
- Doshas (effect on humors): quietens all three doshas: vata, kapha, pitta, and is especially effective for pitta

Amla is a popular component in therapies for a burning feeling everywhere in the body, as well as many forms of inflammation and fever; these are indications of pitta (fire) agitation (Williamson, 2000). Because it has tridosaghna, amla has been regarded the greatest of the Ayurvedic rejuvenative herbs. It has a natural balance of flavours (sweet, sour, pungent, bitter, and astringent) all in one fruit, and it stimulates the brain to rebalance the three

fundamental components of all physiological activities within the body, the water, fire, and air elements [6].

IX. AMLA IN AYURVEDA

Amla has several advantages that are listed in Ayurvedic scriptures. They are as follows:

1. Excellent source of Vitamin C

Amla is the most concentrated source of Vitamin C in the plant kingdom, and when consumed whole rather than as an active component, the Vitamin C is easily absorbed by the human body [43,23]. The tannins in the amla fruit protect the vitamin C from being damaged by heat or light.

2. Enhances food absorption

Regular use of Amla-Berry helps improve digestion, absorption, and assimilation of meals. People who take it notice that their meal tastes better. It stimulates all thirteen digestive fires (Agni). However, it acts more slowly and softly than ginger or other digestion-enhancing herbs, so persons with a lot of Pitta can take it without risk of producing too much stomach acid. Furthermore, it enhances iron absorption for healthy blood.

3. Balances stomach acids

Amla-Berry is great for reducing mild to moderate hyperacidity and other Pitta-related digestive disorders since it helps digestion without heating the body.

4. Fortifies the liver

Amla-Berry aids in the purification of the Rasa Dhatu (nutrient fluid) and RaktaDhatu (blood), hence improving liver functions. It also strengthens the liver, which aids in the removal of toxins from the body [66,29].

5. Nourishes the brain and mental functioning

Amla-Berry is beneficial to the brain. It is medhya for the mind, improving synergy between dhi (acquisition), dhriti (retention), and smriti (recall). It aids in the sharpening of the mind and mental functioning. It benefits the neurological system and the senses [54,71,47].

6. Supports the heart

It is hridya, which means it promotes the health of the heart, blood, and circulation. It is beneficial to

the cardiovascular system. On the other side, it can operate as a heart stimulant at times [73]. Amla has been shown in studies to help decrease cholesterol (Kim *et al*; 2005) and protect against heart disease [75,35,25,61].

7. Strengthens the lungs

The Amla-Berry also helps to balance the Kaphadosha. As a result, Amla-Berry is an excellent tonic for feeding and strengthening the lungs (which are a significant seat of Kaphadosha in the body) and the entire respiratory system. It also calms ShleshakaKapha, which regulates the moisture balance in the lungs, among other things. A fruit with seeds that is used to treat asthma, bronchitis, and biliousness [63,24].

8. Regulates elimination

Amla-Berry calms ApanaVata, facilitating the downward flow of energy in the body. They maintain regular elimination and relieve constipation. Occasionally, the fruit is pickled or preserved in sugar. When dried, it is claimed to be somewhat laxative (Drury, 1970); nonetheless, other sources claim that the fresh fruit is likewise laxative [37]. Fresh ripe fruits are often used as a laxative in India, with one or two fruits sufficing for a dosage. They have been brought to Europe, preserved in sugar, and are prized as a pleasant laxative for children. The pulp of the de-seeded fruit is converted into a dessert.

9. Enhances fertility

Amla-Berry promotes normal and healthy menstruation by balancing ApanaVata and supporting all dhatus (Body tissues). Amla-Berry promotes both men's and women's reproductive systems and can assist overcome infertility. Because it is a vrishya plant, it improves all seven tissues (dhatus), including the reproductive tissue. This plant supports the ovaries and sperm, and it has a virtue known as garbhasthapana, which means it increases fertility and the likelihood of pregnancy. It is especially beneficial to women, as it strengthens the uterus and promotes reproductive health.

10. Helps the urinary system

Amla-Berry is extremely beneficial to the urinary tract and can aid if you have a minor burning sensation when peeing since it stimulates all thirteen agnis (digestive fires) and promotes ApanaVata. It promotes natural diuretic function without forcing water out of the body like diuretic tablets do. In other words, it aids in waste elimination while without overstimulating the urinary system (Tsarong, 1994).

11. Good for the skin

Amla-Berry is beneficial to the complexion since it improves digestion, aids in liver detoxification, and is high in Vitamin C and other minerals. Amla-Berry hydrates the skin, cleanses the tissues of toxins, and strengthens the skin's protection against bacterial illness. It improves radiance and lustre.

12. Promotes healthier hair

Amla-Berry increases calcium absorption, resulting in stronger bones, teeth, nails, and hair. It also helps to preserve young hair colour, prevents premature greying, and strengthens hair follicles, resulting in less thinning with age. The mashed fruits promote hair development and prevent hair greying [64].

13. Acts as a body coolant

Although Amla-Berry is beneficial to all doshas and seasons, it is notably useful in cooling Pitta dosha during the hot season. It is an extremely beneficial rasayana for Pitta and Vata body types [17]. The fruit is said to have a sour flavour and a cooling effect in Tibetan medicine [68].

14. Flushes out toxins

Individuals who have been consuming "junk" food for a long time likely to develop preservative and additive deposits in their liver. Amla-Berry aids the liver in cleaning out toxins and additives from the body.

15. Increases vitality

Amla-Berry boosts energy and relieves exhaustion since it has five tastes, supports all the doshas and numerous physiological processes, and cleanses the blood and microchannels of the body [13]. It promotes cell regeneration, which is the process by which weary old cells are replaced with vital, new ones.

16. Strengthens the eyes

Amla-Berry is known as chakshushya, which means "eye-strengthening" - (Chakshu means "eye" and ayushya means "rasayana" so it is literally a "rasayana for the eyes"). It benefits eye health by boosting both Ranjaka Pitta (the Pitta sub-dosha that affects liver function and blood plasma) and Alochaka Pitta (the sub-dosha of Pitta that governs the eyes and vision). Amalaki's tridoshic characteristic also makes it an excellent eye tonic (Biswas *et al.*, 2001). The leaves' infusion is given to irritated eyes [18]. When dried fruit is soaked in water in a fresh earthen jar for an entire night, it produces a decoction that is used in ophthalmia as a collyrium (a medicinal lotion given to the eye as an eyewash). It may be used either cold or heated [37]. In another therapy, an infusion of the seeds is used as a collyrium and is beneficial for recent conjunctivitis and other eye ailments. The exudate obtained from fruit incisions is used externally to ocular irritation [29]. Amla is commonly used in cataract treatment because it reduces pitta without interfering with the other two doshas [65].

17. Improves muscle tone

Amla-Berry promotes protein synthesis, which is why it is beneficial for muscle strengthening and increasing lean muscle mass. Its distinct Ayurvedic effect provides sportsmen and bodybuilders with a natural technique to tone muscles and increase lean mass.

18. Acts as an antioxidant

Amla-Berry and other rasayanas are powerful broad-spectrum antioxidants and free radical scavengers that aid in disease prevention and slowing the ageing process. Several writers have investigated the use of amla as an antioxidant [33,53,38,12,3,59,8,16]. Experiments at Japan's Niwa Institute of Immunology revealed that amla is a powerful free radical scavenger. According to the findings, amla preparations included significant levels of the free-radical scavenger superoxide dismutase (SOD) in the experimental individuals (Goshal, 1996).

19. Enhances immunity

Amla is a powerful immune booster due to all of its effects. Medical research on amla fruit reveal that it possesses antiviral effects. Udupa serves as an antibiotic and antifungal agent [19, 67].

Boils and spots

The pericarp of the fruit is frequently used in decoctions with other ingredients and is also used topically on boils with cow ghee to stimulate suppuration [29].

20. Chelating agent

Photoaging of the skin is a complicated biologic process that affects several layers of the skin, with notable alterations visible in the dermal connective tissue. Emblica was proven to minimise UV-induced erythema and to have high free-radical quenching capacity, iron and copper chelating ability, and MMP-1 and MMP-3 inhibitory action [16].

Diabetes

The fruits are used to cure diabetes [1, 41, 4, 56, and 18] and an infusion of the seeds is also utilised in other references [37]. Diabetes mellitus is treated using decoctions of the leaves and seeds [67].

21. Diarrhoea

It is a medication used to treat diarrhoea (Mahmood *et al.*, 2009). It is administered to indigenous in situations of diarrhoea as a fruit decoction combined with sour milk. The bark absorbs some of the astringency of the fruit. The root solution is decocted and evaporated to yield an astringent extract similar to catechu. Chronic diarrhoea is treated with an infusion of the leaves and fenugreek seed [29].

22. Diuretic

The fresh fruit has a diuretic effect. A paste made from the fruit alone or in conjunction with *Nelumbium speciosum* (the Egyptian Lotus), Saffron [author's note: *Curcuma longa* (Indian saffron) is more likely than *Crocus sativus* (saffron)] and rose water is a beneficial application to the pubic region in bladder irritation and pee retention. It is used as a febrifuge, antiinflammatory, and, rather strangely, antidiuretic.

23. Gonorrhoea

The bark juice, mixed with honey and turmeric, is used to treat gonorrhoea [29,37]. The barks are said to have antidiarrheal properties and to be used to treat leucorrhoea (vaginal infection) [14].

24. Inflammation

P. emblica has been utilised by rural inhabitants in its growing areas for anti-inflammatory (Dang *et al.*, 2011, 36, 42) and antipyretic therapies [15].

25. Anticancer and antiulcer effects

The anticancer properties of *P. emblica* aqueous fruit extract were investigated in numerous human cancer cell lines, including A549 (lung), HepG2 (liver), HeLa (cervical), MDAMB231 (breast), SKOV3 (ovarian), and SW620 (Colorectal). At dosages ranging from 50 to 100 g/ml, *P. emblica* extract effectively suppressed the development of many human cancer cell lines. According to research, amla can help cure several forms of cancer.

26. Apoptosis

It can be used to predict tumour response following anticancer therapy. The induction of apoptosis by *Emblica officinalis* Polyphenols (EOP) in mouse and human cancer cell lines [51]. In a dose-dependent way, *P. emblica* extract inhibited cell cycle regulatory enzymes cdc 25 phosphatase. The extract's IC50 dosage was determined to be 5 g/ml (Jose *et al.*, 2001). The modulatory impact of EOP fractions on liver tumours caused by Nitrosodiethylamine (NDEA) in rats was studied for 20 weeks, 5 days a week, followed by NDEA treatment. The treated animals were tested for alkaline phosphatase (ALP), glutamate pyruvate transaminase (GPT), and liver glutathione Stransferase (GST). The levels of the aforementioned enzymes were raised, however EOP therapy decreased the activity of all enzymes [51].

27. Liver cancer

Only a few research have speculated on *P. emblica*'s chemopreventive properties against liver cancer. It was evaluated in vivo on wistar rats that had been exposed to the carcinogen Diethylnitrosamine (DEN) (200mg/kg b.wt.i.p) to produce liver cancer. Pre-treatment with

methanolic fruit extract (100 and 200 mg/kg b.w.) resulted in considerable clinical symptoms at both dosages. *Emblica officinalis* has the ability to improve the carcinogen-induced response in rats [58].

X. POTENTIAL THERAPEUTIC APPLICATIONS

Amla possesses several applications in various fields.

Antioxidant

In addition to being utilised as spices and flavourings, herbs and flavours are also naturally antioxidants [48]. Amla fruit extract exhibits its chemopreventive and anti-oxidant qualities. Flavonoid and tannin have the highest antioxidant effects, while all phenolic substances have this property [48]. The combined effects of phytophenols, flavonoids, and ascorbic acid were used by [54] to establish the antioxidant nature of *E. officinalis*. Similar to this, [62]. It showed that a hepatocyte cell line (HepG2) may increase endogenous antioxidant activity by consuming an aqueous extract of the Amla fruit [62].

Hepatoprotective

Since ancient times, natural remedies have been used to treat liver diseases [30]. It is a very efficient hepatoprotective isolated salt therapy that is comparable to current therapy since all of the chemical components can be separated [21]. Liver inflammation may lead to liver infection. However, Amla fruit demonstrates a positive reaction in the treatment of liver damage since it contains a wealth of biochemical compounds including Vitamin C, flavonoids, and tannins. Natural remedies made from Amla fruit help the liver absorb N nitrosodiethylamine, which has anti-inflammatory, apoptotic, oxidation, and autophagy inhibitory properties [22].

Nephroprotective

The Amla study also indicates its efficiency against kidney infection in rats, which promotes the ageing process [75].

Hypolipidemic

The Amla fruit, like other plants, is hypolipidemic, lipid deficient, and immunological modifying in nature due to the presence of excess flavonoid or other substances that lower glucose. *E. officinalis* can control blood lipid levels, including triacylglycerides and cholesterol [20].

XI. RECOMMENDED DOSAGE OF VITAMIN C

Nowadays, Amla powder is extensively used for enhancing entire immune system. According to U.S. Recommended Dietary Allowance (RDA), daily ingestion of nutritional vitamin C is given as below:

Age group	Daily Allowance in mg
Infants (age below 1 year):	30 to 35
Children (age 1 to 14 years):	40 to 50
Adolescent (age 15 to 18 years):	65 to 75
Men (age over 18 years):	90
Women (age over 18 years):	75

XII. HOME REMEDIES OF AMLA

Table 4: Home remedies uses and their appropriate way to uses

Remedies in	Way to use
Stabilizer of blood sugar	Every day, take amla seeds or dried amla powder in capsules with bitter gourd juice.
Natural cholesterol remedy	It strengthens the cardiac muscles and reduces total cholesterol, LDL cholesterol, VLDL cholesterol, and triglycerides significantly. After checking with your doctor, you can add a 500 mg capsule of dried Amla powder to your regular regimen.
Treats	A high vitamin C intake aids in

hypertension	blood pressure regulation. Triphala tablets or decoction, as well as amlachoorana (powder). Triphala, a mixture of Amla and two other herbs, is a good blood pressure medicine.		added to the diet treats this disease.
Natural cure for Anemia	Amla is high in vitamin C, also known as ascorbic acid, which aids in iron absorption.		
Herbal cough remedy	Drink a spoonful of Amla juice or powder in a glass of warm milk three times each day. This will relieve a sore throat, and adding some ghee to this decoction will relieve a cough. To treat a persistent dry cough, combine Amla powder with honey and suck this combination twice a day. Amla is extremely beneficial in the treatment of TB, asthma, and bronchitis.		
Natural eye tonic	Fresh Amla juice or dry Amla pills can help with near-sightedness, cataracts, and glaucoma. It lowers intraocular tension and improves eyesight.		
Promotes hair growth	Amla oil is made by boiling dried Amla fruits in coconut oil and then grinding them. This conditioner is quite good in preventing hair baldness and greying. Combine half a cup of Amla juice, half a cup of lime juice, and little water for greasy hair. Make an anti-grease hair shampoo using this.		
A pitta pacifier	Coconut water is used to cook amla, and the powdered mixture is then applied to the scalp. Amla oil is a fantastic technique to lessen the heat of the summer. It is an effective treatment for pitta problems. .		
Treats white spots on the nails	Serving as a source of vitamin C, it is a useful treatment for vitamin deficiency. Amla juice or powder		

XIII. CONCLUSION

Amla, also known as Indian gooseberry, has long been used in traditional, folk, and Ayurvedic medicine. Over the past few decades, numerous biological and pharmacological investigations have been conducted on a variety of phytochemicals obtained from Amla, including tannins, flavonoids, terpenoids, and tannins. Amla phytochemicals, such as ellagic acid, emblicanin-A, emblicanin-B, gallic acid, phyllanthin, quercetin, and phyllanthidin, have been found to have a variety of biological activities, including antioxidant, antimicrobial, anti-inflammatory, antidiabetic, anti-radiation protection, chemopreventive, and wound healing properties. The current study revealed that some *Emblica officinalis* bioactive chemicals are similarly widespread in other plant species used in pharmaceutical production. Therefore, more analysis of unstudied bioactive Amla components is necessary to reveal the continuously emerging bioactivities of this potent medicinal plant. Fitness has turned into a religion for the current age, and the healthy appearance is popular. The unthinking use of extra vitamin tablets to maintain and strengthen their system is also harmful. In fact, medical experts say they may even prove to be life-ending. Instead, if they use natural products, they will not only profit greatly but will also significantly reduce the expense of purchasing those harsh pills. The common "Amla," or gooseberry, is a free source of vitalizer in the vegetable market. The highest source of vitamin C is in it. When amla is sun dried, its vitamin C concentration rises. For instance, if 100 g of fresh amla has 600 mg of vitamin C, its amount rises to 1500–1600 mg when sun dried. The equivalent number of fresh gooseberries is the same as 16 bananas or 3 oranges. There is evidence that a number of phytochemicals, including tannins, flavonoids, terpenoids, and alkaloids, have pharmacological qualities such as antioxidant, anticancer, antitumor, antigenotoxic, and anticarcinogenic activities. It is regarded as a risk-

free herbal remedy with no negative effects. Therefore, it can be said that Indian gooseberry is a fruit with a history of use and a track record of effectiveness in therapeutic settings.

XIV. SUGGETIONS FOR FUTURE WORK

There have been a wide market demand of amla as it has immense of therapeutic and nutraceuticals benefits for it its preservation without change in nutritive value can be done to increase its shelf life and also maintain its demand in the off season it is also important to study the allergic effects of amla as it contain high amount of phytochemicals.

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