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A REVIEW ON EMBLICA OFFICINALIS GAERTN

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ABSTRACT

Phyllanthus emblica Linn. or Emblica officinalis Gaertn., commonly known as Indian

gooseberry or Amla, is one of the most significant medicinal plants in Indian traditional systems of medicine, including Ayurveda, Unani, and Siddha. All parts of the plant are recognized for their therapeutic properties, with the fruit being the most vital. Amla is extensively utilized in pharmaceuticals worldwide for its antioxidant, hepatoprotective, cardioprotective, gastroprotective, and hair-strengthening activities, either alone or in combination with other herbs. Scientific studies indicate that Amla contains a wide range of biochemical constituents, including alkaloids, phenols, tannins, multivitamins, and inorganic elements. Key organic compounds such as ellagic acid, gallic acid, emblicanin A & B, phyllembein, quercetin, and ascorbic acid contribute to its health-promoting effects. This review highlights the geographical distribution, nutritional profile, phytochemical composition, pharmacological activities, and ethnomedicinal uses of Amla, emphasizing its role as a valuable natural therapeutic agent.

INTRODUCTION

Emblica officinalis (EO) is highly esteemed in Ayurveda, one of India's indigenous medical systems. According to ancient Indian mythology, it is regarded as the first tree created in the universe. Belonging to the Euphorbiaceae family, it is also known as Amla, Phyllanthus emblica, or Indian gooseberry. Nature has provided humans with numerous medicinal plants that promote a healthy and disease-free life. Among these, Amla is one of the most widely utilized herbs in Ayurveda, Unani, and Siddha systems of medicine.

Amla is commonly used as a rejuvenating tonic to restore the body's vitality and energy. It is a rich nutritional supplement with multiple therapeutic benefits. Due to its high content of

phenolic compounds, the fruit of Emblica officinalis is considered a potent source of natural antioxidants, nutraceuticals, and bioactive constituents. It is extensively employed in the preparation of herbal and pharmacological formulations.

Fig 1: *Emblica officinalis* fruit [3]

The E. officinalis tree is generally small to medium-sized (8–18 m) and is distributed across India, Pakistan, Sri Lanka, China, and Malaysia. Its leaves are pinnate-like, simple, dull green, and sessile; the bark is thin and light grey; flowers are greenish-yellow; and the fruit is pale yellow with six trigonal seeds enclosed in three hard-coated cocci.

Amla fruit is rich in nutrients, including vitamins (especially vitamin C), amino acids, and essential minerals. Its bioactive compounds include alkaloids, tannins, gallic acid, emblicanin A and B, and ellagic acid, which impart various medicinal properties. Traditionally, the fruit is used to manage jaundice, diarrhea, inflammation, and other ailments. It is also used alone or in combination with other herbs to treat stomach and liver disorders, hair loss, and ulcers.

Scientific studies and pharmaceutical reports indicate that Amla exhibits analgesic, anti-mutagenic, cardioprotective, gastroprotective, nephroprotective, neuroprotective, anticancer, chemopreventive, radioprotective, and immunomodulatory effects. These properties make it effective in managing cancer, diabetes, liver diseases, stomach ulcers, cardiovascular disorders, and many other health conditions. This review aims to highlight the medicinal significance, nutritional profile, routine uses, and phytochemical composition of Amla.

Table 1: Taxonomical classification [6]

Kingdom	Plantae (Plant)
Sub-kingdom	Tracheobionta (Vascular plant)
Super-division	Spermatophyta (Seed containing plant)
Division	Angiospermae (Flowering plant)
Class	Dicotyledonae (Dicotyledons- two cotyledons)
Sub-class	Rosidae
Order	Geraniales
Family	Euphorbiaceae
Genus	*Emblica*
Species	*Officinalis Geartn.*

Table 2: Vernacular name [6]

Sr. No.	Language	Vernacular names
1	Sanskrit	Amla, Amaliki, Dhatriphala, Amalkan
2	Hindi	Amla
3	Punjabi	Aula
4	Gujarati	Amla

Plant Morphological Description

Amla (Emblica officinalis) is a small to medium-sized deciduous tree with greenish-gray or reddish bark, typically reaching a height of 8–18 m. Its flowering period occurs from March to May, while the fruiting season spans September to November.

The leaves are alternate, pinnate, and bifurcated, measuring approximately 3 mm wide and 1.25– 2 cm long, with numerous linear-obtuse leaflets that are entire, striated, and alternate. The petioles are round and sessile.

Leaves

Fig 2: Leaf [8]

Bark: Thin, light grey bark that exfoliates in small, irregular flakes.

Fig 3: Bark [8]

Flowers

The flowers are small, inconspicuous, and greenish-yellow, forming dense clusters in the lower leaf axils. Male flowers are unisexual, numerous, and borne on short slender pedicels, whereas female flowers are fewer, subsessile, and contain a three-celled ovary.

Fruit

The fruit is pale yellow, globose, fleshy, and slightly depressed, measuring about 2 cm in diameter. It has six obscure vertical furrows enclosing six trigonous seeds within three two-seeded crustaceous cocci.

Organoleptic Properties

- Color: Yellowish-green
- Texture: Hard
- Odor: Aromatic
- Taste: Sour
- Shape: Globose and slightly flattened
- Size: 1.5–2.5 cm in diameter

Phytochemistry

Emblica officinalis is among the most extensively studied medicinal plants. Its fruits are rich in tannins, alkaloids, and phenolic compounds, as well as minerals, proteins, and amino acids such as glutamic acid, proline, aspartic acid, alanine, cystine, and lysine. Remarkably, its vitamin C content surpasses that of oranges, tangerines, and lemons.

The pericarp contains hydrolysable tannins including emblicanin A & B, punigluconin, and pedunculagin. Phytochemicals have been identified through activity-directed fractionation,

chromatography, and spectroscopic analyses, revealing compounds such as gallic acid, methyl gallate, corilagin, furosin, and geraniin. Flavonoids like quercetin are also present, along with alkaloids including phyllantine and phyllantidine. Other constituents include ellagic acid, chebulinic acid, chebulagic acid, citric acid, emblicol, pectin, trigalloyl glucose, 1-O-galloyl-β- D-glucose, 3,6-di-O-galloyl-D-glucose, 3-ethylgallic acid, isostrictiniin, and kaempferol derivatives.

Phytochemical Distribution in Plant Parts Plant Part Phytochemical Constituents Bark

β-sitosterol, leucodelphinidin, lupeol, tannin

Fruit

3–6-di-O-galloyl-glucose, alanine, ascorbic acid, aspartic acid, arginine, β-carotene, boron, calcium, carbohydrates, chebulagic acid, chebulinic acid, chebulaginic acid, chebulic acid, chloride, copper, corilagic acid, corilagin, cystine, d-fructose, d-glucose, ellagic acid, emblicanin A & B, emblicol, ethyl gallate, gallic acid, gallic acid ethyl ester, gibberellins (A1, A3, A4, A7, A9), glucogallin, glucose, glutamic acid, glycine, histidine, iron, isoleucine, leucine, lysine, malic acid 2-O-gallate, manganese, magnesium, methionine, myo-inositol, myristic acid, niacin, nitrogen, pectin, phenylalanine, phosphorus, phyllemblinic acid, phyllemblic acid, polysaccharide, potassium, proline, protein, quercetin, riboflavin, rutin, selenium, serine, silica, sodium, starch, sucrose, sulfur, tannin, terchebin, thiamin, threonine, trigalloyl glucose, tryptophan, tyrosine, zinc, zeatin, zeatin riboside, zeatin nucleotide, phyllantidine, phyllantine.

Phytochemical Distribution in Plant Parts

- Leaf: Amlaic acid, astragalin, ellagic acid, gallotannin, kaempferol, kaempferol-3-O-glucoside, phyllantidine, phyllantine, rutin, tannin.
- Root: Ellagic acid, lupeol.
- Seed: β-sitosterol, flavonoids, linolenic acid, myristic acid, oleic acid, palmitic acid, stearic acid, tannin.
- Shoot: 3–6-di-O-galloyl-glucose, β-sitosterol, chebulagic acid, chebulinic acid, ellagic acid, gallic acid, glucogallin, lupeol.
- Twig: Tannins.
- Whole Plant: Ascorbic acid, lupenone.

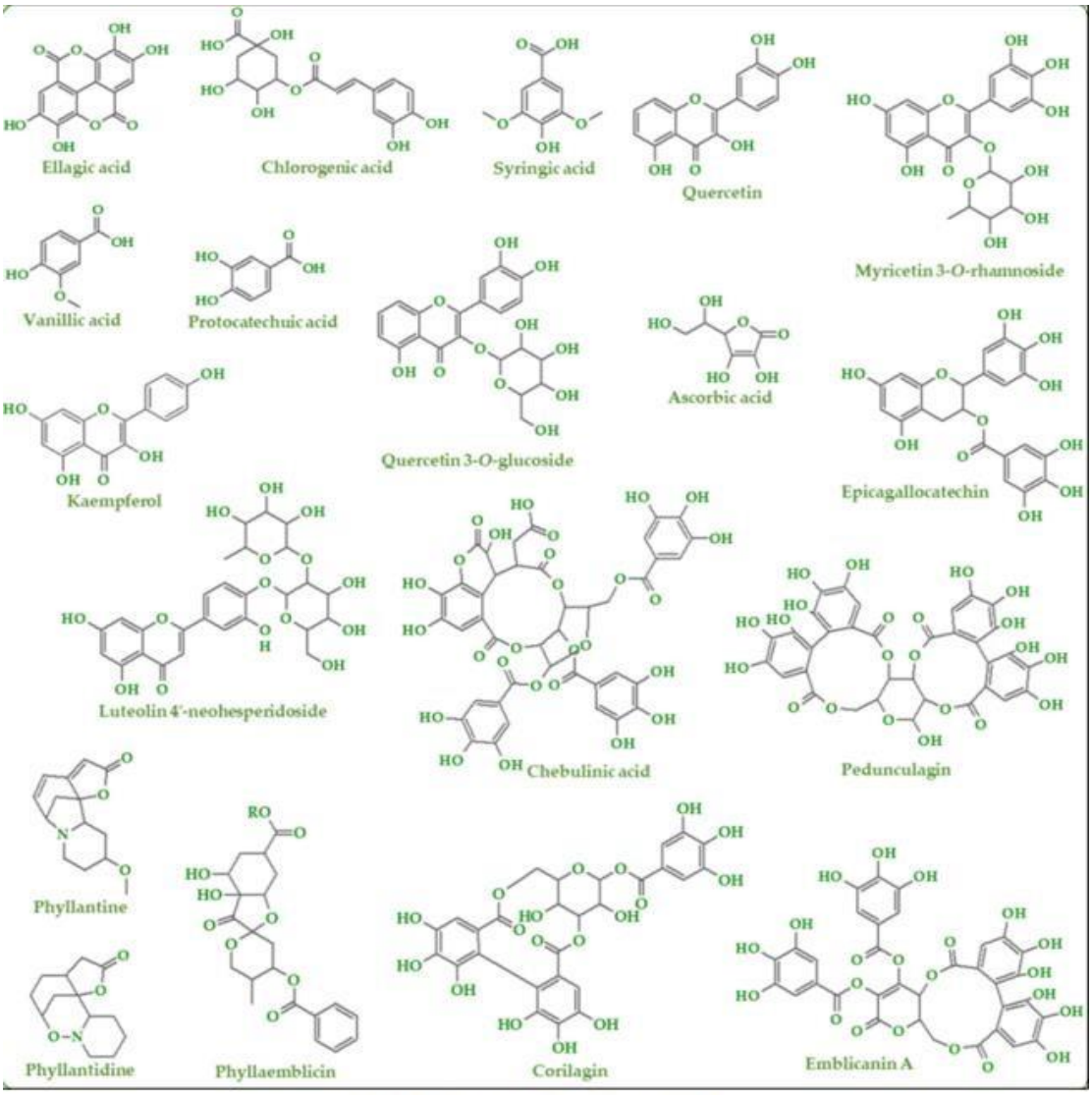

Fig 4: Phytochemicals found in Amla [3]

Nutritional Value

Emblica officinalis (Amla) is often called the "Queen of Ayurvedic Rejuvenating Herbs" due to its balanced taste profile (sweet, sour, pungent, bitter, and astringent) and multifunctional fruit properties. The fruit is renowned for its dietary and therapeutic value.

Amla fruit is one of the richest natural sources of vitamin C, containing approximately 200–900 mg per 100 g of edible portion. Its juice provides nearly 30 times more vitamin C than orange juice, and a single fruit has the equivalent antiscorbutic effect of one to two oranges.

In addition to vitamin C, Amla is rich in minerals and amino acids, including calcium, phosphorus, iron, niacin, carotene, thiamine, riboflavin, and nicotinic acid, making it a highly

nutritive and therapeutic fruit.

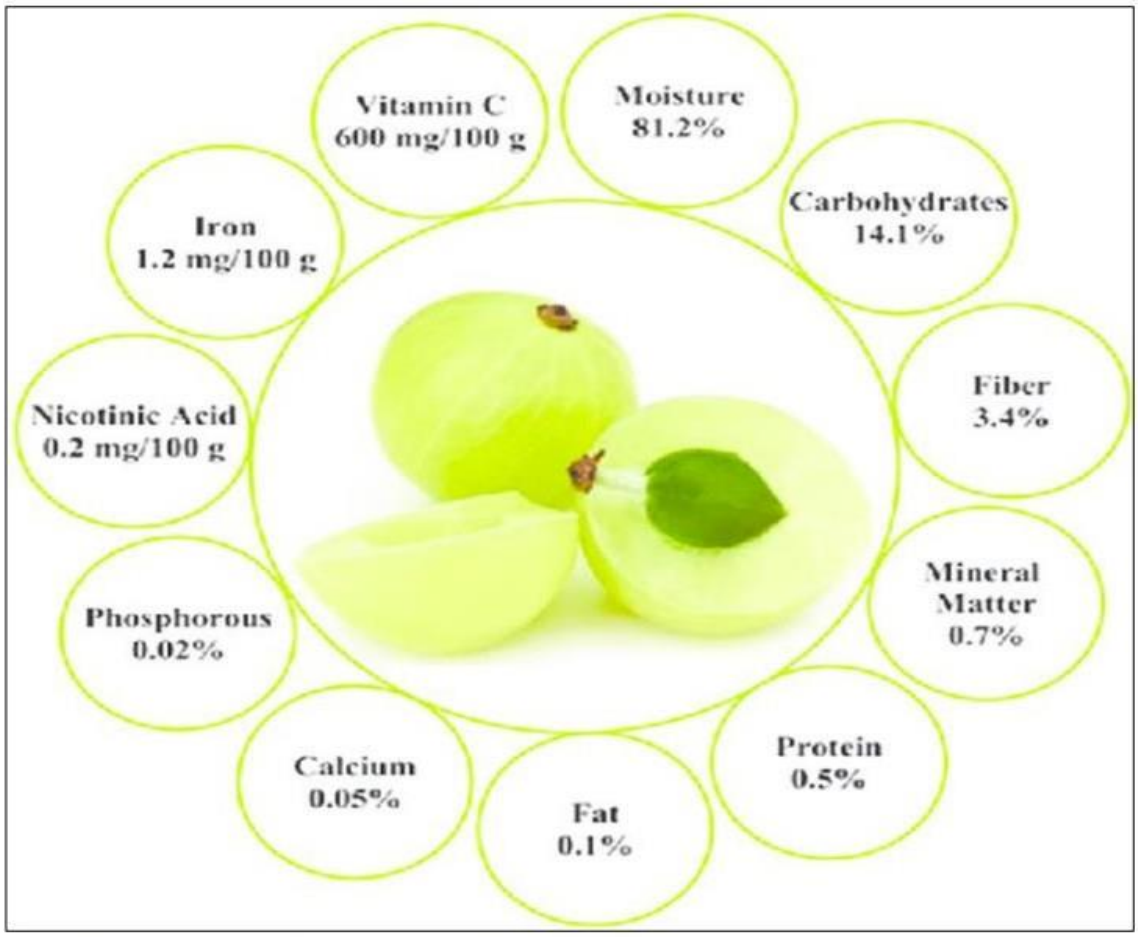

Fig 5: Nutritional value of fruit of *Emblica Officinalis* (Amla) (% or per 100g) [9]

Pharmacological Importance of Emblica officinalis

(i) Diabetes and Related Complications

Dietary interventions can play a key role in managing diabetes. Like garlic, onion, and turmeric, Emblica officinalis (Amla) has been shown to lower blood glucose levels. Daily consumption of 2–3 g of Amla powder can improve HDL cholesterol and control LDL cholesterol levels.

Additionally, Amla has protective effects against diabetic neuropathy (Srinivasan K, 2005).

(ii) Eye Disorders

Amla and its tannoids reduce oxidative stress in ocular tissues, reversing changes in lipid peroxidation, protein carbonyl content, and antioxidant enzyme activity. It also prevents

aggregation and insolubilization of lens proteins caused by hyperglycemia, thereby protecting against diabetic cataracts (Suryanarayana P et al., 2007).

(iii) Nephroprotective

Amla demonstrates protective effects against kidney damage, particularly in aging models, by reducing oxidative stress and promoting renal health (Yokozawa T et al., 2007).

(iv) Cardioprotective

Amla supports cardiovascular health by preventing atherosclerosis and other heart disorders. Its high polyphenol content reduces LDL oxidation and promotes cardiac muscle recovery. Research shows it possesses heart-protective, antioxidant, and free radical scavenging properties (Patel & Goyal, 2011; Zhao et al., 2008).

(v) Anticancer

The polyphenols in Amla contribute to its anticarcinogenic activity by modulating inflammation, oxidative stress, and radiation-induced cellular damage (Priego S et al., 2008).

(vi) Osteoporosis

Amla fruit strengthens fragile bones and supports bone regeneration. Extracts of E. officinalis promote the maturation of osteoclasts and improve bone density over time (Penolazzi L et al., 2008).

(vii) Dermoprotective

Amla extract has been used for over two decades in skin care, anti-aging, and treatment of dermatological disorders. Its antioxidant properties protect the skin from oxidative stress and free radical damage, making it a key ingredient in cosmetic formulations (Datta & Paramesh, 2010).

(viii) Immunostimulant

Rich in ascorbic acid, Amla enhances immune function, stimulating immune cells and antibody production, effectively doubling immune response (Kumar S et al., 2011).

(ix) Gastroprotective

Amla exhibits gastroprotective properties, preventing gastrointestinal infections and treating diarrhea. Its extracts demonstrate spasmolytic activity, supporting gut health (Romano et al., 2012; Mehmood MH et al., 2011).

Ethnomedicinal Uses

Emblica officinalis (Amla) is revered in Ayurveda as a potent rasayana (rejuvenator), helping to delay degenerative changes and aging. It promotes longevity, enhances digestion, relieves constipation, and according to traditional Ayurvedic texts, it also reduces fever, purifies blood, alleviates cough, eases asthma, strengthens the heart, improves vision, stimulates hair growth, invigorates the body, and enhances cognitive function.

The fruit contains bioactive constituents such as alanine, asparagine, gallic acid, glucose, glutamic acid, niacin, pectin, phenylalanine, glucogallin, manganese, magnesium, ethyl gallate, calcium, carbohydrates, chebulic acid, fats, fibers, and flavonoids, which are edible and nutritionally beneficial. When applied topically to the scalp, Amla strengthens hair, prevents premature graying, and promotes natural pigmentation.

Traditionally, Amla has been used to treat a wide range of conditions, including diarrhea, indigestion, ulcers, inflammation, nausea, fever, skin lesions, wounds, and scurvy. Its astringent fruits are employed for ophthalmic problems, gastritis, hyperacidity, colitis, hemorrhoids, hematuria, menorrhagia, anemia, diabetes, asthma, osteoporosis, weakness, and fatigue in various folk medicinal practices.

CONCLUSION

Amla (Emblica officinalis) is a well-established medicinal herb in India with a broad spectrum of health-promoting effects. The fruit is widely distributed in tropical and subtropical regions and is utilized in Ayurveda as a powerful rasayana, as well as in modern medicine for respiratory disorders, eye diseases, diabetes, inflammation, and other ailments.

The fruit's rich antioxidant and phytonutrient profile, primarily derived from its high polyphenol content, supports anticancer activity and protects against free radical-induced oxidative stress. Scientific evidence demonstrates that Amla can directly inhibit oxidative reactions and activate endogenous antioxidant defense systems.

Despite promising data, further research—especially animal and clinical studies—is needed to strengthen the evidence for its therapeutic applications. This review summarizes the nutritional value, ethnomedicinal uses, pharmacological importance, and mechanisms of action of Amla. With its abundant vitamins (particularly ascorbic acid), antioxidants, and bioactive compounds, Amla serves as a natural remedy to prevent and manage numerous health conditions, reinforcing the value of herbal medicine in disease prevention and health promotion.

REFERENCES

1. Khan KH. Roles of Emblica officinalis in medicine-A review. Bot Res Int. 2009;2(4):218-228.
2. Dasaroju, S., & Gottumukkala, K. M. (2014). Current trends in the research of Emblica officinalis (Amla): A pharmacological perspective. Int J Pharm Sci Rev Res, 24(2), 150-159.
3. Gul M, Liu ZW, Rabail R, Faheem F, Walayat N, Nawaz A, Shabbir MA, Munekata PE, Lorenzo JM, Aadil RM. Functional and Nutraceutical Significance of Amla (Phyllanthus emblica L.): A Review. Antioxidants. 2022 Apr 22;11(5):816, 2-15.
4. Baliga MS, Dsouza JJ. Amla (Emblica officinalis Gaertn), a wonder berry in the treatment and prevention of cancer. European Journal of Cancer Prevention. 2011 May 1;20(3):225-239.
5. Kulkarni KV, Ghurghure SM. Indian gooseberry (Emblica officinalis): Complete pharmacognosy review. International Journal of Chemistry Studies. 2018;2(2):5-11.
6. Shrivastava S, Kaur J, Mehraj M, Feroz F, Chawla J, Kumari S. Emblica officinalis (Amla): A comprehensive review of the miracle berry.2022, 6-16.
7. Gantait S, Mahanta M, Bera S, Verma SK. Advances in biotechnology of Emblica officinalis Gaertn. syn. Phyllanthus emblica L.: a nutraceuticals-rich fruit tree with multifaceted ethnomedicinal uses. 3 Biotech. 2021 Feb;11(2):1-25.
8. Jain PK, Das DE, Pandey NA, Jain PR. Traditional Indian herb Emblica officinalis and its medicinal importance. Innov J Ayurvedic Sci. 2016;4(4):1-5.
9. Jain PK, Das DE, Kumar Jain P. Pharmacognostic comparison of bacopa monnieri, cyperus rotundus and emblica officinalis. Innov J Ayruvedic Sci. 2016;4:16- 26.
10. Hassan SM, Mughal SS, Aslam A, Mushtaq M, Munir M, Pervez S, Shabbir N, Ayub AR, Farman M. Emblica officinalis (Amla): A prospective review on distinctive properties and therapeutic applications of Amla. Biomedical Nursing. 2020;6:22-30.
11. Bhandari PR, Kamdod MA. Emblica officinalis (Amla): A review of potential therapeutic applications. International Journal of Green Pharmacy (IJGP). 2012;6(4), 257-269. 12.
12. Srinivasan K. Plant foods in the management of diabetes mellitus: spices as beneficial antidiabetic food adjuncts. International journal of food sciences and nutrition. 2005 Jan 1;56(6):399-414.
13. Suryanarayana P, Saraswat M, Petrash JM, Reddy GB. Emblica officinalis and its enriched tannoids delay streptozotocin-induced diabetic cataract in rats.2007
14. Yokozawa T, Kim HY, Kim HJ, Okubo T, Chu DC, Juneja LR. Amla (Emblica officinalis Gaertn.) prevents dyslipidaemia and oxidative stress in the ageing process. British Journal of Nutrition. 2007 Jun;97(6):1187-95.
15. Patel SS, Goyal RK. Prevention of diabetes-induced myocardial dysfunction in rats using the juice of the Emblica officinalis fruit. Experimental & Clinical Cardiology. 2011;16(3):87.
16. Priego S, Feddi F, Ferrer P, Mena S, Benlloch M, Ortega A, Carretero J, Obrador E, Asensi M, Estrela JM. Natural polyphenols facilitate elimination of HT-29 colorectal cancer xenografts by

chemoradiotherapy: a Bcl-2-and superoxide dismutase 2-dependent mechanism. Molecular cancer therapeutics. 2008 Oct;7(10):3330-42.

17. Penolazzi L, Lampronti I, Borgatti M, Khan MT, Zennaro M, Piva R, Gambari R. Induction of apoptosis of human primary osteoclasts treated with extracts from the medicinal plant Emblica officinalis. BMC complementary and Alternative Medicine. 2008 Dec;8:1-1
18. Datta HS, Paramesh R. Trends in aging and skin care: Ayurvedic concepts. Journal of Ayurveda and integrative medicine. 2010 Apr;1(2):110. 19. Kumar S, Gupta P, Sharma S, Kumar D. A review on immunostimulatory plants. Journal of Chinese Integrative Medicine. 2011 Feb 1;9(2):117-28.
19. Mehmood MH, Siddiqi HS, Gilani AH. The antidiarrheal and spasmolytic activities of Phyllanthus emblica are mediated through dual blockade of muscarinic receptors and Ca2+ channels. Journal of Ethnopharmacology. 2011 Jan 27;133(2):856-65.
20. Ikram A, Khalid W, Aziz M, Arif MA, Jha RP, Khalid MZ, Fizza C, Mehmood MZ, Haseeb M, Rahim MA, Naeem S. Nutritional and biochemical composition of amla (Emblica officinalis) and its therapeutic impact: A review. Acta Sci Nutr Health. 2021;5:153-160
21. Tasduq SA, Kaisar P, Gupta DK, Kapahi BK, Jyotsna S, Maheshwari HS, Johri RK. Protective effect of a 50% hydroalcoholic fruit extract of Emblica officinalis against anti- tuberculosis drugs induced liver toxicity. Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives. 2005 Mar;19(3):193-197.
22. Ghosal S. Active constituents of Emblica officinalis: Part I. The chemistry and antioxidative effects of two new hydrolysable tannins, Emblicanin A and B. Indian J. Chem.. 1996;35:941-948.
23. Srinivasan P, Vijayakumar S, Kothandaraman S, Palani M. Anti-diabetic activity of quercetin extracted from Phyllanthus emblica L. fruit: In silico and in vivo approaches. Journal of pharmaceutical analysis. 2018 Apr 1;8(2):109-118.