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An Investigation of Emblica Officinalis Phytochemistry, Pharmacological Properties, and Traditional Use

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KEYWORDS

Amla, Chemical Constituents, Pharmacological activity, Amla commercializatio n, Taxonomic, Vernacular name.

ABSTRACT: Plants have been significant in human development since ancient times, providing natural medicine that promotes a long, healthy life free from illness. Emblica officinalis, a medicinal plant also known as amla or Indian gooseberry, belongs to the Euphorbiaceae family. This herbaceous plant has been widely used for its medicinal qualities, with the fruits being particularly beneficial. People use amla fruits for both medicinal and tonic purposes, aiming to restore their lost vitality and stamina. They contain high levels of minerals, amino acids, vitamin C, and other vital micronutrients. Traditional medicine uses these fruits to treat conditions such as diarrhea, jaundice, and inflammation. E. officinalis includes a variety of bioactive substances with antibacterial, anti-inflammatory, antioxidant, anticancer, hepatoprotective, and other pharmacological activity, including tannins, flavonoids, saponins, terpenoids, and ascorbic acids. The review includes the pharmacological characteristics, traditional use, geographic distribution, commercialization, and therapeutic qualities of this highly regarded medicinal plant. Introduction: Ayurveda, an Indian traditional medicinal system, regards amla (Emblica officinalis) (EO) as sacred. According to Indian mythology, Amla, also known as Indian gooseberry or Phyllanthus emblica, was the first tree to exist in the universe and is a member of the Euphorbiaceae family. Amla grows not only in its native India but also in Southeast Asia, China, Pakistan, Uzbekistan, Sri Lanka, and other tropical and subtropical climates.

Objectives: The objective of the current study was to estimate the *Emblica officinalis'* chemical composition, pharmacological activity, commercialization, taxonomic classification, Vernacular name, and profile.

Methods: The literature used in this work was sourced from a number of databases, including Research Gate, Google Scholar, Pubmed, and Scopus.

Conclusions: Amla, also known as Indian gooseberry, has been used in traditional medicine, such as Ayurveda, and tribal medicine for many years. This plant contains various phytochemicals, including tannins, flavonoids, terpenoids, and polyphenolic compounds. In recent decades, researchers have started investigating the biological and biopharmaceutical properties of these phytochemicals found in amla. Some of the important compounds found in Amla include emblicanin A, gallic acid, emblicanin B, ellagic acid, quercetin, phyllantidine, and phyllantine, which have shown different biological activities.

1. Introduction

Ayurveda, an Indian traditional medicinal system, regards amla (*Emblica officinalis*) (EO) as sacred. According to Indian mythology, Amla, also known as Indian gooseberry or *Phyllanthus emblica*, was the first tree to exist in the universe and is a member of the Euphorbiaceae family. Amla grows not only in its native India but also in Southeast Asia, China, Pakistan,

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Uzbekistan, Sri Lanka, and other tropical and subtropical climates.^[1] Ayurvedic remedies frequently include amla fruits because they are believed to strengthen the body's defenses against disease.^[2] It can help with degenerative disorders like cancer, diabetes, anemia, liver disease, heart problems, and ulcers. Several hepatoprotective formulas rely heavily on it as a key component. Amla, one of the richest sources of minerals and amino acids, is extremely nutrient-dense, including vitamin C.^[3] Its chemical makeup is diverse and includes alkaloids, tannins, and phenols.^[4] Among all the hydrolyzable tannins, ellagic acid, gallic acid, and emblicanin A and B have demonstrated biological activity. Nearly every component has therapeutic qualities, but the fruit is especially useful. It is a potent rasayana in Ayurveda and conventional medicine; it is used to treat conditions such as inflammation, jaundice, diarrhea, and other conditions. ^[5] The amla fruit is a major component of the Indian medical system, either by itself or in conjunction with other plants. It functions as an antipyretic, laxative, diuretic, liver tonic, stomachic, refrigerant, and hair tonic to cure fever and the common cold, as well as to avoid ulcers and dyspepsia. According to pharmacological research, amla possesses several beneficial effects, including analgesic, ^[6] antitussive, ^[7] anti-atherogenic, ^[8] adaptogenic, ^[9] cardioprotective, ^[10] gastroprotective, ^[11] nephroprotective, ^[12] neuroprotective, ^[13] anticancer, ^[14] and gastroprotective. [11] Additionally, chemopreventive, [15] [16] radioactive, chemopreventive, [17] immunomodulatory, ^[18] free radical scavenging, ^[19] antioxidant, ^[19] anti-inflammatory, ^[20] and antimutagenic properties have all been linked to amla. Atherosclerosis, diabetes, gastric ulcers, liver, heart, and cancer disorders, as well as anemia, can all be effectively treated and prevented using these qualities.

Classification

1. Amla Fruits: The amla fruit is almost spherical, with a width of 18 to 25 mm. The pericarp, or mesocarp, of the fruit is yellow, while the endocarp ripens to a yellowish-brown colour. Fresh Amla fruit's mesocarp tastes sour, but dried fruit that is 20 mm in length has a puckery taste. and mature between November and February. Its six fuzzy vertical lines split its perfect surface. The central Amla leaves have a width of 2-3 mm and a length of >8–10 mm. Cats frequently feed on these hairless, light green leaves. On the underside, they are either pale green or frequently pubescent.

- 2. Amla Oil: The seeds and fruits of the amla plant yield amla oil. Its fat and oil have a colour range from golden yellow to light brown. It has a pleasant aroma with hints of sweetness and nuttiness. This oil is known for its moisturizing properties and has a moderately thick consistency.
- **3. Amla seeds:** Each fruit contains four to six dark brown, smooth-to-touch seeds. They make an excellent source of amla oil. Amla seeds commonly treat bronchitis and asthma.
- 4. Amla bark (Amla extract): It is typically 12 mm thick and has a gray-brown or gray-green tint. The alcoholic extraction method for amla fruit extract yields an extremely effective antiviral extract.^[21]

Fig. 1: Amla or E. officinalis



Table 1: Vernacular names of *E. officinalis* ^[22,23,24]

S.no	Language	Vernacular names
1.	Hindi	Amla, Amlika,
2.	Assami	Amalaki, Amluki
3.	Bengali	Amla, Amlati, Aunlah
4.	Arabic	Amliy
5.	Cuttack	Alathanda
6.	English	Emblica myrobalan tree
7.	Gujarati	Amli, Ambala, Ambri
8.	Malayalam	Nelli
9.	Marathi	Avla, Aonli
10.	Nepal	Amla
11.	Punjabi	Ambal, Ambul

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12.	Urdu	Anwala

Table 2: Classification taxonomy of E. officinalis [25]

Botanical names (s):	Emblica officinalis
Kingdom:	Plantae
Division:	Angiospermae
Class:	Dicotyledonae
Order:	Geraniales
Family:	Euphorbiaceae
Genus:	Emblica
Species:	Officinalis Gearth

Synonyms

Phyllanthus emblica is a plant species with a variety of scientific names that is usually referred to as an Indian gooseberry or amla. Dichelactina nodicaulis Hance, *Emblica officinalis* Gaertn., Diasperus emblica (L.) Kuntze, Phyllanthus glomeratus Roxb, Cicca emblica (L.) Kurz, Emblica arborea Raf, formerly Wall; nom. inv. Among the scientific names are Phyllanthus mimosifolius Salisb., Phyllanthus taxifolius D. Don, and Phyllanthus mairei H. Lév. ^[26].

Table 3: An explanation of *E. officinalis's* botany.

Characteristic	Description		
Nature	South East Asia, Uzbekistan,		
environment	southern and central India, the		
	Macaprene Islands, southern		
	China, Pakistan, Bangladesh, Sri		
	Lanka, and Malaysia. ^[27,28,1]		
Appearance	A medium-sized, deciduous tree		
	that ranges in height from 8 to 18		
	meters. The bark of the tree is		
	light gray and sheds in small,		
	uneven flakes. ^[29]		
Used part	Fresh fruit, dried fruit, seeds,		
	leaves, bark from the roots, and		
	flowers. ^[1,30]		

Leaves	Simple, subsessile, light green, and resembling pinnae. Closely spaced along the branchlets. ^[29]
Fruits	15–25 mm in length and 18–25 mm in width; both apexes have a tiny, subtle conic depression, and the shape is almost spherical or globular. When fully ripe, the endocarp is yellowish brown, whereas the mesocarp is yellow.
	Globose, juicy, and pale yellow, three crustacean cocci with two seeds apiece have six dark vertical grooves encircling six trigonous seeds. ^[29]
	Globose, juicy, and pale yellow in hue, three crustacean cocci with two seeds each have six trigonous seeds encircled by six dark vertical grooves. ^[31]
	Ripe fruits take on a light brown colour, whereas fresh fruits have a bright green hue. On average, the fruit weighs between 60 and 70 grams. ^[30]
Flowers	Greenish-yellow, axillary fascicle-forming, unisexual; few subsessile, 3-celled ovary females; and many men on short, slender pedicels. ^[29,27]
Seeds	Six, silky, deep brown. ^[1]
Barks	Thick to 12 mm, gleaming either gray-green or gray-brown. ^[1]
Flowering and	December, January, and
fruits	February–May. ^[27]
Edible part	The hard stone that encases the seed is made up of mesocarp and endocarp. ^[32]

Chemical constituents

Ascorbic acid, or vitamin C, is abundant in amla fruit and has a concentration of 600–750 mg per 100 grams of

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fresh pulp. In addition, fruits have roughly 5% tannin, phyllemblin, and 0.5 percent fat. Amla fruits are also a good source of calcium, iron, and phosphorus. It has a significant pectin content. The fresh fruits have approximately 75% moisture. We dry the fruits and store them. Studies have demonstrated that the vitamin content of dried fruits remains significantly intact. It might be because tannins are present, which slow down the oxidation of vitamin C. ^[33]

Fig. 2: Potential components of *Emblica officinalis* chemically



 Table 4: Phytochemical compounds present in E.

 officinalis

S.N	Bioactive	Chemical Constituents		
0	Compound			
1.	Alkaloids	Phyllembein, Phyllantine,		
		and Phyllantidine. ^[34]		
2.	Amino acid	Proline, aspartic acid, and		
		cystine Alanine, glutamic		
		acid, lysine, ^[34]		
3.	Carbohydrat	Pectin ^[34]		
	е			
4.	Flavonoids	Quercetin, Kaempferol		
		[34,35,36]		
5.	Organic	Citric acid ^[25]		
	acids			
6.	Sterol	β-sitosterol-3-O-β-D-		
		glucoside and streptasterol-		
		7,22-dien-3-O-β-D-		
		glucoside. ^[37,38]		

7.	Tannins	Emblicanin A and B, viz.,			
		hydrolysable tannins,			
		Ellagotannin, Punigluconin,			
		Pedunculagin, chemagic acid			
		(benzopyran tannin),			
		chemicinic acid			
		(Ellagitannin), geraniin			
		(dehydroellagitannin),			
		corilagin (Ellagitannin),			
		ellagic acid, phyllemblin,			
		pyrrogalol, gallic acid, and			
		corilagin ^[34,30,39]			
8.	Triterpenes	Secofriedelanophyllemblicin			
		e, Ursophyllemblicoside. ^[41]			
9.	Vitamins	Ascorbic acid ^[34]			
10.	Essential oil	Methyl salicylate and			
		benzaldehyde ^[41]			

Fig. 3: Chemical structure of various constituents of *E. officinalis*



Chebulagic acid





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Pharmacological Properties

Antifungal activity

Researchers have discovered that *E. officinalis*, also known as Indian gooseberry or *Emblica officinalis*, possesses antifungal properties against the type of fungus Aspergillus. ^[42] In a study comparing its effectiveness with the antibiotic Grisofulvin, *E. officinalis* fruit extracts in both acetone and ethanol exhibited some efficacy against Fusarium equiseti and Candida albicans, two other types of fungi. ^[43] However, the phytoanolic extract of *E. officinalis* could not inhibit the growth of Aspergillus niger F2723, which is a phytopathogenic fungus. ^[44]

Activity as a free radical scavenger and antioxidant

The total phenolic material, called gallic acid equivalent, is present in the fruit and seeds of E. officinalis. This acid has strong antioxidant properties and is crucial for scavenging free radicals, which are needed to maintain redox equilibrium, which is linked to several disorders.^[45] degenerative Emblica officinalis methanolic seed extract exhibits concentrationdependent 1,1-diphenyl-2-picrylhydrazil (DPPH) free radical eliminates action.^[46] Fruit pulp methanolic extract has anti-oxidant and absorbance of free radicals properties as well.^[47,48,49,50,51] Several The study concluded with positive evidence that the methyl alcohol extract of dried Phyllanthus emblica leaves has both antibacterial and antioxidant activity, based on a comparative analysis.^[52] In a different study, it was shown that the E. officinalis fruit water extract made by the ability of Thai herbal pharmacopoeia to reduce ferric iron is rather high, free radical scavenging, and

preventing the production of ROS (reactive oxygen species). $^{\left[53\right] }$

Insecticidal activity

Important components of *E. officinalis*, saponins, can kill or poison some insects. ^[54] Even so, saponins that exhibited insecticidal activity were gathered from non-*E. officinalis* natural sources. However, since *E. officinalis* also contains bioactive substances called saponins, it is clear that the plant may have insecticidal potential. Additional research can be done to determine this with greater accuracy.

Mozzicidal and larvicidal activity

We tested the ability of Anopheles stephensi, the malaria vector, to kill mosquitoes. We discovered that the methanol extract of E. officinalis effectively killed both larvae and pupae, achieving a 98% mortality rate at a concentration of 100 parts per million (ppm). [55,56] At concentrations of 400 ppm and higher, both the methanol and ethanol extracts of E. officinalis showed complete mortality, meaning no eggs hatched. Another study found that Phyllanthus emblica leaf ethyl acetate extract also possesses larvicidal qualities. The ethyl acetate extract from Phyllanthus emblica leaves is also larvicidal (99.6%) against Aedes aegypti larvae, with an LC50 value of 78.89 ppm. The LC50 value represents the concentration at which 50% of the larvae die. These findings indicate the potential use of both E. officinalis and P. emblica extracts as natural insecticides to control mosquito populations, thereby aiding in the prevention of diseases such as malaria and dengue fever. [56]

Antidepressant activity

Antidepressant has tested a Swiss Albino mouse, an adult male, weighing 25–30 g to see if an aqueous solution of *E. officinalis* fruits has any antidepressant effects. The test was administered using a forced swim evaluate (FST) and a tail suspension test (TST). The test's outcome demonstrated that *E. officinalis's* antidepressant activity was on par with that of imipramine, a common antidepressant medication. ^[57]

Immunostimulating activity

Triphala may enhance the neutrophil activities of immune-stimulated albino rats, according to reports. ^[58] When albino mice were treated with *Emblica*, there were

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dose-dependent increases in a number of parameters. These included serum globulin, peritoneal macrophage migration index, hypersensitivity reaction, total leukocyte count, lymphocyte dispersion percentage, macrophage respiratory burst activity, and relative lymphoid organ weight. These findings indicate that *Emblica* can also activate macrophage phagocytes, as well as humoral and cell-mediated immunity. ^[59]

Anti-inflammatory properties

In Sprague-Dawley rats, *E. officinalis* demonstrated antiinflammatory properties in both acute and chronic inflammatory conditions. In the former, carrageenaninduced inflammation reduced paw volume, while in the latter, the cotton pellet induced myeloperoxidase activity, plasma extravasation, granulomatous tissue mass, and tissue lipid peroxidation. ^[60] *E. officinalis* water extract inhibits the generation and release of inflammatory mediators in rats. ^[61]

Anti-proliferative and anti-cancer properties

E. officinalis showed promise in treating cervical cancer caused by the human papillomavirus by blocking activator protein-1 and focusing on the gene regulation of viral oncogenes that cause the disease. ^[62] We treated five human cancer cell lines with an ethanol-based entire extract of the plant E. officinalis at a concentration of 100 g/ml in an in vitro cytotoxicity assay. Plant extract showed an 82% growth inhibition against the lung cell line (A-549). The plant extract was inactive in the Hep-2 liver cell line, but it was most active in the colon 502713 cell line. The neuroblastoma cell line IMR-32 and the human liver cancer line HT-29 demonstrated significant activity in 97 percent and 98 percent of the plant's extract. ^[63] E. officinalis fruit extract, at levels between fifty and one hundred g/mL, can effectively inhibit the growth of six lines of human cancer cells: ovarian (SK-OV3), livers (HepG2), respiratory (A549), breast (MDA-MB-231), and colon (SW620). [64] We assessed the effects of P. emblica and T. bellerica extracts on HepG2 and A549 cells using the sulforhodamine B (SRB) assay, either in isolation or in conjunction with doxorubicin or cisplatin. The two plant extracts effectively prevented the two cancer cell types under investigation from proliferating. Furthermore, studies have demonstrated the cytotoxicity of amla extracts and their ability to suppress the growth of several carcinoma cell lines in vitro,

including B16F10 (murine melanoma) and MK-1 (human gastric adenocarcinoma). ^[65]

HIV-inhibition of reverse transcriptase activity

The study used peripheral blood mononuclear cells (PBMCs) to investigate the effects of different fractions of P. emblica plant extract on HIV-Reverse Transcriptase (HIV-RT). The researchers examined the inhibitory activity of these fractions on recombinant HIV-RT. The results demonstrated that the n-hexane fraction and hydrophilic fraction exhibited the strongest suppression of HIV-RT at a 1 mg/ml concentration, with inhibitory levels of 91% and 89%, respectively. The chloroform fraction showed the greatest amount of HIV-RT inhibition at 0.5 mg/ml, whereas the carbon tetrachloride fraction showed the highest level of inhibition at 0.12 mg/ml. Compared to the aqueous and n-hexane fractions, the inhibition was less in both cases. Furthermore, it was demonstrated that the n-hexane and carbon tetrachloride fractions inhibited, at dosages of 0.12 mg/ml and 0.5 mg/ml, respectively, fifty percent of the HIV-RT activity. [66]

Anti-ulcerogenic properties

E. officinalis ethanolic extract effectively prevents H. pylori from proliferating in vitro. The range of the lowest inhibitory control levels was 0.91 to 1.87 μ g/ μ l. This study also revealed that amla's ethanolic plant extract retained its flavonoids, antioxidant properties, reducing power, and total phenolics. As a result, it can be considered a viable treatment option for gastric ulcers and H. pylori infections. ^[67]

Antimutagenic and wound healing activity

A study on Swiss albino mice demonstrated that a 50% methanolic extract of Emblica fruit could protect the mice against the known mutagen cyclophosphamide. ^[68] Strong antioxidants like tannins and ascorbic acid, namely emblicanin B and emblicanin A, are present in this extract. Proposals suggest that these antioxidants aid in cell repair. In addition, the study revealed increases in tensile strength, aldehyde content, type III collagen, acid-soluble collagen, DNA, and shrinking temperature. Furthermore, the study showed that signals outside the cell regulated an increase in kinase 1/2 activity. These results imply that the emblica stimulates wound-related cellular growth. ^[69]

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In vitro culture

Researchers developed a one-step approach to highenergy somatic embryogenesis using in vitro techniques from *Emblica officinalis* juvenile leaf tissues. For the most callus formation (67.5%), the researchers found that a solution with 0.45 μ M 2, 4-dichloro phenoxy acetic acid and 22 μ M 6-benzyl aminopurine worked best. Furthermore, by directly producing proembryos in MS media, they successfully carried out somatic embryogenesis and plantlet regeneration using cotyledon explants derived from in vitro germinated seeds. ^[70] Additionally, the researchers evaluated the efficacy of shoot proliferation using nodal explants and found that the MS medium was the most effective for this purpose. ^[71]

S.	Amla	Compan	Link	
Ν	based	У		
0	Product			
1.	Kapiva	Kapiva	https://www.kapiva.in/immunity/kapiva-amla-juice-1-1/?utm_campaignname	
	amla			
	juice			
2.	Sri sri	Vitro	sri https://m.netmeds.com/non-prescriptions/srisri-tattva-amla-candy-400-gm	
	tattva			
	amla			
	candy			
3.	Amla	Patanjali	https://www.amazon.in/dp/B01KTSBSU8/ref=cm_sw_r_apan_glt_fabc_XRYKS4G0NJ	
	Patanjali		RAADPZWWN1?	
	candy		_encoding=UTF8&psc=1	
4.	Jiva	Jiva	https://store.jiva.com/products/amla-juice-500-ml-pack-of-2/	
	amla			
	juice			
5.	Himalay	Himalay	https://himalayawellness.in/products/amalaki	
	а	а		
	amalaki			
6.	Alps	Alpa	https://www.purplle.com/product/alps-goodness-health-juice-amla-300-m	
	goodness			
	health			
	juice			
	amla			
7.	Bold fit	Boldfit	https://www.snapdeal.com/product/boldveda-amla-flavour-fruit-juice/685447153231	
	boldveda			
	pure			
	natural			
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9.	Dabur	Dabur	nups.//ui.inpkart.com/s/og0yeAmmini	
	Juice			

 Table 5: Amla's Commercialization [72]

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10	Baidyana	Baidyana	https://www.baidyanath.com/amla-juice-pack-of-2.html
•	th amla	th	
	juice		
11	Vedic	Vedic	https://dl.flipkart.com/s/oQ9TkUuuuN
	Wellness		
	sweet		
	amla		
	candy		
12	Dr.	Dr.	https://www.1mg.com/otc/drmorepen-amla-candy-healthy-chatpata-for-adults-
	Morepen	morepen	otc686932
	amla		
	candy		
13	Amlamr	Amlamr	https://www.amazon.in/dp/B01N8X0MHE/ref=cm_sw_r_apan_glt_fabc_6X7F0SCSRW
	ut amla	ut	HZMW0EE3NJ? _encoding=UTF8&psc=1
	pachak		
14	Kapiva	Kapiva	https://www.kapiva.in/skin-hair/kapiva-aloe-amla-juice-11/?utm_campaignname
	aleo +		
	amla		
	juice		
15	Kapiva	Kapiva	https://www.corahealth.in/products/kapiva-amla-juice
	ayurveda		
	wild		
	amla		
	juice		

Traditional Therapeutic Application

S. No	Treatment for	Parts used	Preparation/Dose
1.	Spots and boils	Pericarp of fruit	mixture with ghee from cows.
2.	Costiveness	Fruit	We use sugar to pickle or preserve amla fruit.
			We also dry and consume fruit every day.
3.	Dental disease	leaves, node Root,	You can consume amla roots twice a day,
			right after dinner, after gathering and
			processing them.
4.	Diabetes	Fruit	For two months, drink one spoonful of amla
			juice every day combined with one cup of
			bitter gourd juice.
5.	Diarrhea	Bark, root, Fruit,	We mix the fruit decoction with the
		leaves	astringency or acid of the fruit bark. We
			develop the root solution and then decoct it to
			obtain an astringent extract that bears a
			resemblance to catechu. The leaves also
			incorporate fenugreek seed.
6.	Diuretic	Fresh fruit	Fruit paste is combined with Nelumbium
			speciosum (lotus) and saffron rose water.
7.	Fever	Leaves, fresh fruit,	Combine amla leaves and seeds with sugar
		seed	and dried grapes. Alternatively, fresh fruits

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			are decocled, as are compounds with the
			same proportions as humans: emblica,
			chitral, and chebulic myrobalan.
8.	Gonococcal infection	Bark	We crush the fruit's bark and mix it with
			turmeric and honey.
9.	encourage the growth of hair	Fruit	When amla fruit, either fresh or dried, is
	while avoiding graying		boiled in coconut oil, it can stop hair from
			going gray. Soaking dried amla in water
			overnight will also prevent hair from
			receiving nourishment.
10.	Headaches	Fruit	Combine the mashed fruit with the
			buttermilk.
1111.	sleep disturbance, body	Fruit	Eat raw fruits every night before going to
	coolant		bed.
1212.	ocular illness	Seed	It is possible to apply seed infusion
			externally.
1113.	oral ulcers	Root Bark, leaf	We use crushed and mixed root bark and
			leaves for oral irritation. Additionally, we
			massage and treat aphthous stomatitis with
			root bark.
1114.	Bleeding nose	Seed	To stop nose bleeding, crush amla seeds into
			conjee and fry them in ghee.
1115	Respiratory problem	Fruit	Fruit juice helps with respiratory issues
			caused by cigarette smoking on a regular
			basis.
1116	Piles	Fruits	After lunch or dinner, consume fresh amla
			juice, 100 grams of milk, half a teaspoon of
			ghee, and a teaspoon of honey to cure chronic
			piles.
1117	Skin-lightening	Fruit	Neem and either fresh or dried amla fruit or
			leaves can treat a skin condition.
1118	Gout	Fruit	Combining ghee with amla juice softens
			joints. ^[73]

2. Objectives

The objective of the current study was to estimate the *Emblica officinalis'* chemical composition, pharmacological activity, commercialization, taxonomic classification, Vernacular name, and profile.

3. Methods

The literature used in this work was sourced from a number of databases, including Research Gate, Google Scholar, Pubmed, and Scopus.

4. Discussion

Amla, sometimes referred to as Indian gooseberry, has long been utilised in tribal and traditional medicine, including Ayurveda. Many phytochemicals, such as tannins, flavonoids, terpenoids, and polyphenolic substances, are present in this plant. The biological and pharmacological characteristics of these phytochemicals present in amla have drawn the attention of researchers in recent decades. Emblicanin A, gallic acid, emblicanin B, ellagic acid, quercetin, phyllantidine, and phyllantine are a few of the significant chemicals that are present in amla. These compounds have been demonstrated to exhibit a variety of biological actions. These bioactive

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substances have shown signs of wound healing, preventing chemotherapy side effects, antibacterial, antiinflammatory, hypoglycemic, antitussive, and antiradioprotective properties. Remarkably, comparable bioactive substances have also been discovered in other therapeutic plants.

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