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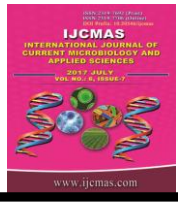

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Emblica officinalis Gaertn. (Amla): A Wonder Gift of Nature to Humans

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A B S T R A C T

Medicinal plants are the precious gift of nature which plays vital role in healthcare sector for developing nation and potent source of therapeutic molecules to heal various diseases in the world. Amla (*Emblica officinalis* Gaertn.) is widely used in the Indian system of medicine and believed to increase defense against diseases. The Amla or Indian gooseberry is known for its therapeutic properties and holds a reputed position in the Ayurvedic and Unani system of medicine in the country as well as whole world. It is a widely known fact that all parts of amla are useful in the treatment of various diseases. Among all, the most important part is fruit. Amla fruit is well known for its unusually high levels of Vitamin C (ascorbic acid), which is resistant to storage and heat damage due to cooking. Due to their strong antioxidant and biological properties, *Emblica officinalis* prevents innumerable health disorder related to oxidative stress, cardiovascular diseases, neurodegenerative diseases and cancer. It also contains various essential nutrients. This article discuss important pharmacological property of *Emblica officinalis* with its nutritional value, biochemical constituents, traditional uses, medicinal value of Amla and its use as a household remedy. In this communication, we reviewed the applications of *Emblica officinalis* for the treatment of various diseases and disorders with its rich medicinal value for the benefits of human health.

Introduction

"Life is magic, the way nature works seems to be quite magical."-- Jonas Salk

As we all know that in this universe every entity are created by mother nature and all are pre- programmed for their particular roles. Medicinal plants are the most precious creation of nature which is the ultimate gift for all the creatures includes mankind also. It plays vital role for maintaining the human health and provides potent source of therapeutic molecules to heal various diseases all over in the world. Our Indian traditional systems of medicine (like Ayurveda, Unani, siddha) have abundant medicinal plants which are used from ancient times; herbs have been the original source for most of the drugs. Amla (*Emblica officinalis* Gaertn.) enjoys a hallowed position in Ayurveda- an Indian indigenous system of medicine. According to believe in ancient Indian mythology, it is the first tree to be created in the universe. It belongs to family Euphorbiaceae. It is also named as Amla, *Phyllanthus emblica or* Indian gooseberry. The species is native to India and also grows in tropical and subtropical regions. The fruits of *Emblica officinalis* are widely used in the Ayurveda

and are believed to increase defense against diseases (Fig. 1). It has its beneficial role in cancer, diabetes, liver treatment, heart trouble, ulcer, anemia and various other diseases. Similarly, it has application as antioxidant, immunomodulatory, antipyretic, analgesic, cytoprotective, antitussive and gastroprotective.

Additionally, amla is useful in memory enhancing, ophthalmic disorders and lowering cholesterol level. It is also helpful in neutralizing snake venom and as an antimicrobial. It is often used in the form of Triphla which is an herbal formulation containing fruits of *Emblica officinalis*, *Terminalia chebula and Terminalia belerica* in equal proportions. Beside this *Emblica officinalis* is a rich source of vitamin C. The transformation of environment is a complex process that is influenced by the nature and amount of the problem present, the structure and dynamics of the indigenous living community, and the interplay of geochemical and biological factors (Shrikant Kol *et al.*, 2014) (Fig. 2).

Classification

Kingdom: Plantae
Subkingdom: Tracheobionta
Super division: Spermatophyta
Division: Angiospermae
Class: Dicotyledonae
Subclass: Rosidae
Order: Geraniales
Family: Euphorbiaceae
Genus: *Emblica*
Species: *officinalis* Gaertn

Varieties

There are various varieties recommended for cultivation are Banarasi, Chakaiya, Francis, NA-4 (Krishna), NA 5 (Kanchan), NA-6, NA-7, NA-10 and BSR-1 (Bhavanisagar).

Botanical description of the plant

Amla (*Emblica officinalis* Gaertn.) is a small to medium sized deciduous tree and 8-18 meters height with thin light grey bark exfoliating in small thin irregular flakes, leaves are simple, subsessile, closely s*et al*ong the branchlets, light green having the appearance of pinnate leaves; flowers are greenish yellow, in axillary fascicles, unisexual, males numerous on short slender pedicels, females few, subsessile, ovary 3-celled; fruits globose, fleshy, pale yellow with six obscure vertical furrows enclosing six trigonous seeds in 2- seeded 3 crustaceous cocci found throughout India.

AMLA: A natural wonder

It is one of the precious gifts of nature to mankind. Fruit known in Sanskrit as-Amalaka, Hindi- Amla, Tamil- Nellikai, Bengali- Amalaki, Nepalese- Amala, Telugu-Usirikai,. Amla is a high rich source of vitamin C, among 1 gm of vitamin C per 100 ml fresh juice, and requisite for the synthesis of collagen, which is liable for keeping the cells of the body together. It increases the red blood cell count and helps to promote good health. Numerous experimental evidences have shown that amla fruit possess anti-inflammatory, antioxidant, Hepatoprotective and hypocholesterolemic activities.

Vitamin C present in amla is one of the main factors that can help to retrieve or refill the energy lost by body. So, the replenishment of new energy causing by amla is considered as a natural refreshner.

Chemical constituents and nutritive values

Amla is well known for its nutritional qualities which contains dietary source of Vitamin C, minerals and amino acids. Research reports suggest that it contains

tannins, alkaloids and phenols. Amla Fruits have 28% of the total tannins distributed in the whole plant. Its fruit contains two hydrolysable tannins Emblicanin A and B, which have antioxidant properties; one on hydrolysis gives gallic acid, ellagic acid and glucose wherein the other gives ellagic acid and glucose respectively. The fruit also contains Phyllemblin. Activity directed fractionation revealed the presence of several phytochemicals like gallic acid, corilagin, furosin and geraniin. Flavonoids like quercetin, alkaloids like phyllantine and phyllantidine are found. Along with these, it primarily contains amino acids, carbohydrates and other compounds given in table 1. Its fruit juice contains the highest concentration of vitamin-C (478.56mg/100mL). Vitamin C levels are more than those in oranges, tangerines and lemons.

In comparison with other fruits like apple, the edible fruit tissue of amla is rich with proteins 3-fold and ascorbic acid160-fold and contains considerably higher concentration of most minerals and amino acids. Proline, Glutamic acid, aspartic acid, alanine, and lysine are 14.6%, 29.6%, 8.1%, 5.4% and 5.3% respectively of the total amino acids. Some other Compounds isolated from amla fruit are gallic acid, ellagic acid, 1-Ogalloyl- beta-D-glucose, 3,6-di-O-galloyl-D-glucose, chebulinic acid, quercetin, chebulagic acid, corilagin, 1,6-di-O- galloyl beta-D-glucose, 3-Ethylgallic acid (3-ethoxy 4,5-dihydroxybenzoic acid) and isostrictinin. Its Fruit also contains flavonoids, kaempferol-3-O-alpha L-(6"-methyl) rhamnopyranoside andkaempferol-3-O-alpha L (6"-ethyl) rhamnopyranoside.

Pulpy matter of fruit, after drying found to contain: gallic acid 1.32%, tannin, gum13.75%; albumin 13.08%; crude cellulose17.08%; mineral matter 4.12% and moisture 3.83%. The amla seeds yield a fixed oil (16%) which is brownish-yellow in colour. It has the following fatty acids: linoleic acid (44.0%), linolenic acid (8.8%), stearic acid (2.15%), oleic acid (28.4%), palmitic acid (3.0%) and myristic acid (1.0%) (Table 2).

Medicinal importance of amla (*Emblica officinalis* Gaertn.)

Traditional uses in Ayurveda

The Amla fruit has these properties using the Ayurvedic classifications:

Rasa (taste)**:** sour and astringent are the most dominant, but the fruit has five tastes, including sweet, bitter, and pungent

Veerya (nature): cooling, it uses in treatment of burning sensation in inflammation and fever which are considered to be manifestations of pitta (fire) agitation

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.

Due to its cooling nature, amla is a common ingredient in treatments for a burning sensation anywhere in the body and for many types of inflammation and fever; these are manifestations of pitta (fire) agitation. Amla or Amlaki has been considered the best of the Ayurvedic rejuvenative herbs, because it is tridosaghna. Likewise, it has a natural balance of tastes (sweet, sour, pungent, bitter and astringent) all in one fruit, it stimulates the brain to rebalance the three main components of all physiological functions, the water, fire, and air elements within the body (Bajracharya, 1979).

In traditional folk medicine, the fruits, which are sour, astringent, bitter, acrid, sweet and anodyne. Exert several beneficial effects include cooling, ophthalmic, carminative, digestive, stomachic, laxative, dyspepsia, aphrodisiac, rejuvenative, diuretic, antipyretic and tonic. They are useful in vitiated conditions of tridosha, diabetes, cough, asthma, bronchitis, cephalalgia, ophthalmopathy, dyspepsia, colic, flatulence, hyperacidity, peptic ulcer, erysipelas, skin diseases, leprosy, haematogenesis, inflammations, anaemia, emaciation, hepatopathy, jaundice, diarrhoea, dysentery, haemorrhages, leucorrhoea, menorrhagia, cardiac disorders, intermittent fevers and premature greying of hair (Hair tonic). Amla is also stated to have hepato, cardio, nephro and neuroprotective effects; antioxidant, anti-inflammatory, analgesic, antipyretic and restorative properties.

Acts as an antioxidant

The Amla is a rich source of vitamin C and low molecular weight hydrolysable tannins. This makes Amla a good source of antioxidant.

Amla is considered as an antioxidant has been examined by a number of researchers (Vani, 1997; Bhattacharya *et al.,* 1999; Golechha *et al.,* 2012). The research studies showed that Amla preparations contained high levels of the free-radical scavenger, superoxide dimutase (SOD), in the experimental subjects (Treadway, 1994). Amla or *Emblica officinalis* reduced UV-induced erythema and showed free-radical quenching ability, chelating ability to iron and copper as well as MMP-1 and MMP-3 inhibitory activity (Chaudhuri, 2003)

Various tannins like embelicanin-A (37%), emblicanin-b (33%), punigluconin and pedunculagin have been found to provide protection against oxygen radical included haemolysis of rat peripheral blood erythrocytes. The mechanism of action of antioxidant activity has been due to recycling of sugar moiety and conversion of the polyphenol into medium and high molecular weight tannins. Ellagic acid, as a powerful antioxidant present in *Emblica officinalis,* has the ability to inhibit mutations in genes and repairs the chromosomal abnormalities.

Scurvy

As an extremely rich source of vitamin C, Amla or Indian gooseberry is one of the best remedy for scurvy, powder of the dry herb, mixed with an equal quantity of sugar, 3 times a day with milk.

Anti-inflammatory, Antipyretic and Analgesic effect

Extracts of *Emblica officinalis* leaves and fruits possess potent anti-inflammatory, anti-pyretic as well as analgesic activity.

Fruit extracts of *Emblica officinalis* possess potent anti-pyretic and analgesic activities. A single

Oral dose of ethanolic extract and aqueous extract (500 mg/kg) showed significant reduction in hyperthermia in rats induced by brewer's yeast, both of these extracts elicited pronounced inhibitory effect on acetic acid-induced writhing response in mice in the analgesic test. This may be due to the presence of tannins, alkaloids, phenolic compounds, amino acids and carbohydrates.

Yet in other research studies, fruit extract was found to be an effective anticoagulant and anti-inflammatory agent as it potentially and significantly reduced lipopolysaccharide (LPS)-induced tissue factor expression and von Willebrand factor release in human

umbilical vein endothelial cells (HUVEC), it also decreased the concentrations of pro-inflammatory cytokines, TNF-a and IL-6 in serum on oral administration of the amla fruit extract (50 mg/kg body weight. Further, the Beta-glucogallin an aldose reductase inhibitor that catalyzes the reduction of toxic lipid aldehydes to their alcohol products and mediates inflammatory signals triggered by lipopolysaccharide (LPS) was isolated from *Emblica officinalis*. This molecule may be a potential therapy for inflammatory diseases.

Antimicrobial and Antimutagenicity activity

Various research studies conducted on Amla fruit leaf and bark suggest that it has antimicrobial activity which includes Antibacterial, antifungal and antiviral properties.

Studies showed that ether extract and 80 percent alcoholic extract of fruits acidified with hydrochloric acid, were found to have antibacterial activity. The other extract of acidified alcoholic extract showed the highest activity, inhibiting the growth of *M. pyogenes* var. *S. typhosa* and *S. paratyphi* at a concentration of 0.21mg /ml and that of *M. pyogenes* var. *albus*; *S. schottmmellari* and *S. dysenteriae* at a concentration of 0.42mg/ml (Khorana *et al.,* 1959).The potent antibacterial activity was reported against *Escherichia coli*, *K. ozaenae*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *S. paratyphi A, S. paratyphi B* and *Serratia marcescens*. The fungal endophytes inhabiting *Emblica officinalis* showed antimicrobial and antioxidant activity.

Anticancer and antiulcer effects

Amla is a wonder berry known for the treatment and prevention of Cancer. It inhibits the growth and spread of different types of cancer like, breast, pancreases, liver, uterus, stomach and malignant ascites. It also reduces the side effect induced by radiotherapy and chemotherapy, which generally used for the treatment of cancer. *Emblica officinalis* also have some medicinal properties, including immune stimulator and antitumor activity. *E. officinalis* cause induction of apoptosis in Dalton's lyphoma ascites (DLA) and CeHa cell lines. It also shows inhibition of DNA topoisomerase I in *saccharomyces cervisiae*, mutant cell culture and the activity of cdc25 tyrosine phosphatase.. *E. officinalis* also having role in Inhibition of *in vitro* cell proliferation in human tumor cell lines like human erythromyeloid K562, T-lymphoid Jurkat, B-lymphoid Raji, erythro leukemic HeLa cell line.

The crude extract of Amla was reported to counteract hepatotoxic and renotoxic effects of metals due to anti-oxidant activity. Triphala exhibits chemopreventive potential when included in the diet of the mice, results in the lowering of the benzo(a)pyrene [B(a)P] induced forestomach papillomagenesis this may be due to the increased antioxidant status in animals by Triphala (Deep *et al.,* 2005). Lipidmetabolizing enzymes, lipids and lipoproteins are reported to be associated with the risk of breast cancer. Kalpaamruthaa (KA) is a modified Siddha preparation containing *Emblica officinalis*, *Semecarpus anacardium* (SA) and honey.

Immunomodulatory effects

Immune system acts as great barrier against any type of infection in our body and immune activation is an effective as well as protective approach against emerging infectious diseases. *Emblica officinalis* had shown to modulate the immune system and the inflammatory response. Immunomodulatory properties of fruit extracts of *Emblica officinalis* were evaluated using chromium

(VI) as an immunosuppressive agent. Amla also inhibited apoptosis and DNA fragmentation and relieved the immunosuppressive effects of (chromium) Cr on lymphocyte proliferation. Lymphocyte proliferation activity and histopathological severity of synovial hyperplasia were used to study the anti-inflammatory response of both the extracts, which showed a marked reduction in inflammation and oedema or caused immunosuppression in adjuvant induced arthritic (AIA) rats, indicating that these drugs may provide an alternative approach for the treatment of the arthritis.

Srikumar and his co-worker reported Immunomodulatory activity of Triphala (an herbal formulation containing fruits of *Emblica officinalis, Terminalia chebula* and *Terminalia belerica* in equal proportions) in albino rats. They showed that Triphala stimulates the neutrophil functions in the immunized rats and stress induced suppression in the neutrophil functions.

Hepatoprotective effect

Amla fruits have been reported to be used for hepatoprotection in Ayurveda (Bhattacharya *et al.,* 2005). The protective effect and further inhibition of hepatic toxicity against ethanol induced rat hepatic injury was reported by some authors (Sultana *et al.,* 2005; Pramyothin *et al.,* 2006)

The extract of *E. officinalis* and Chyavanaprash were investigated for its hepatoprotective activity using carbon tetrachloride (CCl4) induced liver injury in rats. Both extracts were observed to inhibit the hepatotoxicity produced by acute and chronic CCl4 administration as seen from the decreased levels of serum and liver lipid peroxides (LPO), glutamate-pyruvate transaminase (GPT) and alkaline phosphatase (ALP). Chronic CCl4 administration was also found to produce liver fibrosis as seen from the increased levels of collagenhydroxyproline and pathological analysis. Both extracts were found to inhibit these elevated levels significantly, showing that the extract could reduce the induction of fibrosis in rat's mode. The protective effect of the hydroalcoholic (50%) extract of *Emblica officinalis* fruit used by S.A. Tasduq *et al*, (2005) against anti-tuberculosis (anti-TB) drug-induced liver toxicity was studied. The *E. officinalis* extract was found to be hepatoprotective, due to its membrane stabilising, antioxidant and CYP 2E1 inhibitory properties (SA. Tasduq *et al*, 2005). Treatment of rats with *E. officinalis* extract (75 mg kg-1 per day) also enhanced liver cell recovery by bringing the levels of AST, ALT and IL-1β back to normal (P. Pramyothin *et al.*, 2006).

Antidiabetic effect

The anti-diabetic activities of *E. officinalis* and its extract have been studied in animal models and in humans. Amlaki or Amla due to its high vitamin C content is effective in controlling diabetes. One tablespoon of its juice mixed with bitter gourd juice, taken daily for two months will stimulate the pancreas and enable it to secrete insulin, thus reducing the blood sugar in the diabetes. Diet restrictions should be strictly observed while taking this medicine. It will also prevent eye complication in diabetes.

Research states that Amla supplement is effective in reducing the Fasting and Post Prandial blood glucose levels and HbA1c levels. The tannoids of *E. Officinalis* are potent inhibitors of Aldose Reductase (AR) and suggest that exploring the therapeutic value of natural ingredients that people can incorporate into everyday life may be an effective approach in the management of diabetic complications.

The species of *E. Officinalis*, was found to be involved in regeneration and rejuvenation of beta cells, thus leading to an increased insulin production and secretion. This mechanism greatly decreases the blood sugar levels. Research Evidence indicates that the aqueous extract of *E. officinalis* has definite hypoglycemic potential as well as anti-diabetic activity. The capability of tannins to enhance glucose uptake and inhibit adipogenesis, makes them potential drugs for the treatment of non-insulin dependent diabetes mellitus. The aqueous extract of *E. officinalis* Gaertn. seeds was investigated for potent its anti-diabetic activity in animal models. STZ (Streptozotocin)-induced type 2 diabetes models were used for the study. This evidence clearly indicates that the aqueous extract of *E. officinalis* seeds has definite hypoglycemic potential as well as anti-diabetic activity.

Amla as an anti- anaemic agent

Anemia is defined as a hematological condition characterized by the reduction in the concentration of hemoglobin accompanied by reduced number of circulating RBC. Main function of RBC is the transportation of oxygen into the tissues of body and in anemia there is decrease in oxygen carrying capacity which is detrimental to the body. Anemia is caused due to various factors such as inadequate absorption or intake of iron, reduced intake of vitamin B12 or folic acid, destruction of red bone marrow, hereditary conditions etc. Amla or Indian gooseberry is a good absorption agent of iron. Vitamin C or Ascorbic acid is highly present in Amla, which helps to reduce iron deficiency. Neem leaves (Azadirachta indica) and its combination with Emblica officinalis (amla) were evaluated for their antianemic activity in phenyl hydrazine induced anaemic animals.

Vamsee Veena A. and her coworkers performed some experiments on murine model system. In this experiment, Rats were divided into 7 groups of 6 each. All the treatments were given orally and continued up to 14 days. On 15th day blood samples were collected by retroorbital puncture and hematological parameters such as haemoglobin (Hb) concentration, RBC count and WBC count were estimated. Results showed that both Azadirachta indica leaves and its combination with Emblica officinalis fruit showed significant anti anemic activity but compared to Azadirachta indica leaf extract alone, its combination with amla showed better activity**.** This synergistic action of plants may be due to increase in absorption of iron from neem leaves due to vitamin C in amla fruit and this combination may be an alternative to synthetic iron therapy in anemia.

Amla fruits contain vitamin C, tannins, flavonoids, ellagic acid, gallic acid, quercetin and other constituents. Since neem leaves are a rich source of iron and amla contains ascorbic acid which facilitates iron absorption, the synergistic effect seen with the combination in this work is convincing. Therefore, Supplements of Amla can be very beneficial to patients suffering from Iron deficiency Anaemia.

Mosquitocidal and larvicidal activity

In a mosquitocidal property evaluation test Murugan *et al.,* observed larvicidal and pupicidal activities of methanol extract of *E. officinalis* against the malarial vector, *Anopheles stephensi* showing 98% mortality rate at 100 ppm. The methanol and ethanol extracts of *E. officinalis* also exerted 100% mortality (no hatchability) at 400 ppm and above. Jeyasankar *et al.,* reported that the larvicidal activity of *E. officinalis* ethyl acetate leaf extracts. The study concluded that the ethyl acetate extract of *E. officinalis* exhibited the maximum larvicidal activity

(99.6%) with LC50 (lethal Concentration brings out 50% mortality) value of 78.89 ppm against the larvae of *Aedes aegypti*.

Wound healing and antimutagenic activity

An investigation on Swiss albino mice showed that 50% methanolic extract of Emblica fruit can protect mice against the chromosome damaging effects of the well-known mutagen cyclophosphamide. Ascorbic acid and tannins of *E. officinalis*, namely emblicanin A and emblicanin B have strong antioxidant action and it is proposed that the addition of these antioxidants support the repair process of cells. Emblica increases cellular proliferation at the wound site, as supported by a raise in the action of extracellular signal-regulated kinase 1/2, along with an increase in DNA, type III collagen, acid-soluble collagen, aldehydes content, shrinkage temperature and tensile strength.

HIV-reverse transcriptase ((HIV-RT)) inhibitory activity

Inhibition of HIV-Reverse Transcriptase (HIV-RT) by *E. officinalis* plant extract fractions was tested on Peripheral Blood Mononuclear Cells. With this test it was observed that aqueous fraction and n-hexane fraction have highest inhibition of recombinant HIV-RT (91% and 89%, respectively) at 1 mg/ml concentration. Chloroform fraction showed highest inhibition of HIV-RT at 0.5 mg/ml and carbon tetrachloride fraction at 0.12 mg/ml concentration. At 0.12 mg/ml and 0.5 concentrations 50% of the HIV-RT activity is inhibited in n-hexane fraction and carbon tetrachloride fraction respectively (Estari *et al.*, 2012).

Respiratory diseases

E. officinalis is the richest source of flavonoids and vitamin C. As an antioxidant, it is very effective in inhibiting lipid peroxidation by scavenging reactive species and free radicals, thus preventing tissue damage. Dietary supplement with amla protects against *K. pneumoniae* mediated respiratory tract infection by keeping a check on the induction of proinflammatory cytokine like TNF-□ □ □ It has also shown hypotensive effect and also a synergistic cholinergic and synergistic histaminergic effect on MABP, HR and RR of anaesthetized male dogs.

Table.1 Amla fruit: chemical constituent

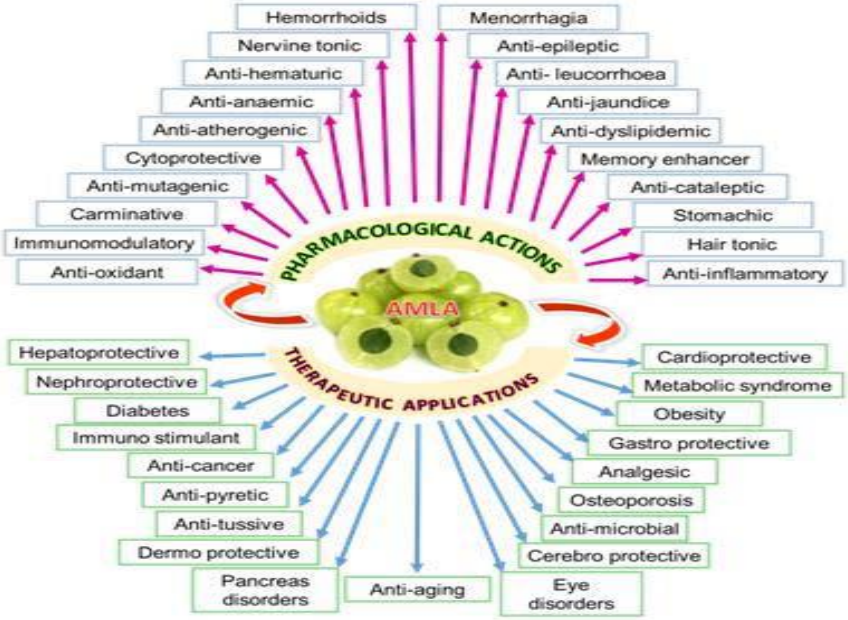
Type	Chemical Constituents
Amino acids	Glutamic acid, Proline, Aspartic acid, Alanine, Cystine, Lysine
Hydrolysable Tannins	Emblicanin A and B, Punigluconin, Pedunculagin, Chebulinic acid (Ellagitannin), Chebulagic acid (Benzopyran tannin), Corilagin (Ellagitannin), Geraniin (Dehydroellagitannin), Ellagotannin
Alkaloids	Phyllantine, Phyllembein, Phyllantidine
Fatty acids	linoleic acid, linolenic acid, stearic acid, oleic acid, palmitic acid and myristic acid.
Phenolic compounds	Gallic acid, Methyl gallate, Ellagic acid, Trigallayl glucose
Carbohydrates	Pectin
Vitamins	Ascorbic acid (vitamin C)
Flavonoids	Quercetin, Kaempferol
Organic acids	Citric acid

Table.2 Nutritional value of fruit pulp of *E. officinalis* (% or per 100g)

Chemical components	Percentage
Fruit: Moisture	81.2 %
Protein	0.5%
Fat	0.1%
Mineral matter	0. 7 %
Carbohydrate	14.1%
Fibre	3.4%
Vitamin C	6 0 0 m g / 1 0 0 g
Bulk elements Mg/100g	N e t w e i g h t
Iron	1.2 mg/100g
Calcium	0.05%
Phosphorous	0.02%
Nicotinic acid	0. 2 m g / 1 0 0 g

Fig.1 An amla plant bearing fruits

Fig.2 Amla: its pharmacological actions and therapeutic applications



In Turkey, the fresh fruit is used for inflammations of the lungs. The extract or juice of the fruit is mixed with honey and pipit added is given to stop hiccough and also in painful respiration. The expressed juice of the fruit along with other ingredients is used to cure cough, hiccough, asthma and other diseases.

Other uses

(a) Appetizer

Use of pickles and preserves made from the green fruits.

(b) Irritability of the bladder, in retention of urine, To the forehead in cephalalgia

Use a paste of the fruit alone or with *Nelumbium speciosum*, Saffron and rose water. Applying it over the affected region.

(c) For hemorrhage, diarrhea and dysentery

Using dried fruit. A decoction prepared from the fruit combined with *T. chebula* and *T. belerica*is useful in chronic dysentery and biliousness, in doses of 1 oz. once or twice daily.

(d) For burning in the vagina

A mixture of the fruit juice and sugar is prescribed as a remedy for burning in the vagina. Juice of the bark combined with honey and turmeric is a remedy for gonorrhea.

(e) Remedy for menstrual disorders

White discharge can be relieved with powdered and dried Amla Seeds, mixture of amla with honey and saunf (fennel) or mixing it with squished banana and consuming.

(f) To stop nausea and vomiting

A powder of the amla seed and red sandalwood is given with honey, to stop emesis.

(g) For bleeding of the nose

Seed fried in ghee and ground in conjee is applied as Lep to the forehead to stop bleeding from the nose.

(h) For scabies or itch

Apply the seed burnt, powdered and mixed in oil for scabies or itch.

(i) As a body coolant

Although Amla is good for all doshas and seasons, it is especially effective in the hot season to cool Pitta dosha. It is an especially good rasayana for people with Pitta and Vata body types. In Tibetan medicine, the fruit have been described as having

- a sour taste with cooling potency
- it helps in regulating blood sugar.
- Amla is powerful food for the brain and helps lower cholesterol.
- Amla also helps maintain the functioning of the liver, increases hemoglobin, red blood cell count. It is useful for Cough, Bronchitis, and Asthma.
- Amla cleanses the mouth, strengthens the teeth. Its decoction is used in hyperacidity and with honey as an anthelmintic.
- the presence of Amla results in an enhanced cell survival, decreased free radical production and higher antioxidant levels.
- there are various classic Ayurvedic preparations, such as Chyawanprash in which Amla is used as a chief ingredient. It helps to improve intelligence and memory power.
- Triphala and Brahmarasayana are other classic medicine in which Amla is being used since time immemorial.

In conclusion, from the ancient time to till present, plants have been playing a key role for the betterment of mankind presenting as an extraordinary source of natural medicine. Presently, the use of herbal products has become the foremost option for human all over the cosmos because of curing treatment without any side effect. The use of medicinal plants in the management of various disease and illnesses is due to their phytochemical constituents and dates back to historical age. Amla (*Emblica officinalis*) has an important position in Ayurveda- an Indian indigenous system of medicine. Amla (*Emblica officinalis*) due to its strong antioxidant and biological properties prevent innumerable health disorders as it contains essential nutrients and highest amount of vitamin C. It can be used as a possible food additive or in nutraceuticals and pharmaceutical industries. Various extracts and herbal formulations of *Emblica officinalis* showed activities against various diseases and result is similar to standard drugs.

It is widely quoted that; one fresh gooseberry is equal to consuming 16 bananas or 3 oranges or 2 apple. A variety of phytochemical such as flavonoids, tannins, terpenoids and alkaloids are reported to indicate several pharmacological properties such as antioxidant, anticancer, antitumor, antigenotoxic, and ant carcinogenic effects. Finally, it is concluded that medicinal plants like Amla having a holy place in traditional Ayurvedic and Unani system as well as newly pharmacological purposes also. There is a colossal necessity to scientifically explore and evident its medicinal values at molecular level with help of various Modern biotechnological tools and techniques (especially molecular markers.).

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