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REVIEW ARTICLE

PERSPECTIVES OF AMLA – A WONDER HERB

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ABSTRACT

Emblica officinalis has been held in high esteem in indigenous medicine. Amla is a commonly used ingredient in the Ayurvedic preparation in the form of fresh fruits, dried fruits, fruit pulp or extract. Traditionally, amla has been called the best of the ayurvedic rejuvenating herb, because through the natural balance of tastes (sweet, sour, pungent, bitter and astringent) all in one fruit. Amla fruit is probably the richest known natural source of vitamin C. It also contains minerals and amino acids such as calcium, phosphorus, iron, niacin, carotene, thiamine and riboflavin. The chemical constituents present in the plant include tannins, gallic acid, ellagic acid, phyllantin, phyllantidine, punigluconin, pedunculagin and some flavonoids. In the present review, the nutritional value of amla, chemical constituents of various parts, medicinal properties have been discussed to provide collective information on its multipurpose commercial values.

Keywords: Emblica officinalis, Vitamin C, Ayurvedic.

INTRODUCTION:

Amla is a traditional food and medicine that inspires awe in the mind of the serious herbalist due to its many known nutritional and medicinal benefits and uses. *Emblica officinalis* Gaertn.(*Phyllanthus emblica* Linn., Amla, Indian Gooseberry) belongs to Euphorbiaceae family.

Amla forms the base for the most popular ancient herbal restorative formula in the world, known as Chayavan Prash. Chayavan Prash is an herbal gel or paste that contains mainly Amla berries with other herbal ingredients and is used daily by hundreds of millions of Asians as a general panacea tonic for the entire family.

Amla fruits are acrid, cooling, refrigerant, astringent, carminative, stomachic, diuretic and laxative. The fruits are useful in vitiated conditions of Tridosah, diabetes, cough, asthma, bronchitis, cephalalgia, ophthalmopathy, dyspepsia, colic, flatulence, hyperacidity, peptic ulcer, erysipelas, skin diseases, leprosy, haematogenesis, inflammations, anemia, emaciation, hepatopathy, jaundice, strangury, diarrhoea, dysentery, hemorrhages, leucorrhoea, menorrhagia, cardiac disorders, intermittent fevers and grayness of hair. The fermented liquor from the fruits is used in dyspepsia, jaundice and cough. Exudation from incision on the fruit is used as external application for the inflammation of eye. Due to rich vitamin C, amla is used in the treatment of human scurvy. *E.officinalis* is also used as antipyretic, analgesic, cytoprotective, antitussive and gastroprotective. It is useful in memory enhancing, ophthalmic disorders and lowering cholesterol levels. Amla powder and oil is used in Ayurvedic applications for the treatment of scalp. Amla powder improves the immunity and imparts physical strength. It improves complexion and removes wrinkles. The flowers are cooling and aperient. The bark is astringent. The herb is also aphrodisiac, haemostatic, nutritive tonic and rejuvenative.

SCIENTIFIC CLASSIFICATION [2-4]

- Kingdom : *Plantae*
- Division : *Angiospermae*
- Class : *Dicotyledonae*
- Order : *Geraniales*
- Family : *Euphorbiaceae*
- Genus : *Emblica*
- Species : *officinalis* Geartn.

VERNACULAR NAMES [2-4]

- English: Indian Gooseberry, Emblic myrobalan
- Sanskrit: Aamalaki
- Hindi: Amla
- Kannada: Nellaka
- Marathi: Anwla
- Gujarati: Ambla
- Malayalam: Nelli kayi

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- Tamil: Nelli
- Telugu: Usirikaya
- Kashmir: Aonla

PART USED:[2-5] Fresh fruit, Dried fruit, Seeds, Leaves, Bark, Flowers and Root.

DISTRIBUTION AND HABITAT:[5] Amla is found throughout the Deccan, sea-coasts districts, Kashmir and on hill slopes up to 200 meters. It is common all over tropical and sub-tropical India and also found in Burma. It is abundant in the deciduous forests of Madhya Pradesh. It also grows in Pakistan, Sri Lanka, Uzbekistan, Bangladesh, South East Asia, China and Malaysia.

PLANT MORPHOLOGY:[6] *Emblica officinalis* is a small to medium tree of 8-18m height.

- **Leaves:** They are 3 mm wide and 1.25-2 cm long, alternate, bifarious, pinnate; leaflets numerous, alternate, linear-obtuse, entire; petioles are striated, round.
- **Flowers:** Small, inconspicuous, greenish-yellow flowers are borne in compact clusters in the axils of the lower leaves. Male flowers are unisexual and numerous on short slender pedicels, females few, sub sessile, ovary 3 celled.
- **Fruit:** Pale yellow, depressed, fleshy, globose, about 2 cm in diameter with 6 obscure vertical furrows enclosing 6 trigonous seeds in 2 seeded 3 crustaceous cocci.
- **Seeds:** Obovate-triangular, 3 celled, seeds 2 in each cell.
- **Bark:** Thin light grey bark exfoliating in small thin irregular flakes.

Figure 1: ***Emblica officinalis*** **plant**

PREPARATION:[3]

The plant is used in many forms

- Decoction
- Infusion
- As liquor
- Powder
- Fresh juice
- Fruit paste
- As fixed and essential oil
- In confection
- In paste and pickles
- Oil and Shampoo

NUTRITIVE VALUE OF AMLA: [3-6]

Amla has been called the best of the ayurvedic rejuvenating herb, because through the natural balance of tastes (sweet, sour, pungent, bitter and astringent) all in one fruit. Amla fruit is probably the richest known natural source of vitamin C. The fruit juice contains nearly 20 times as much vitamin C as orange juice and a single fruit is equal to antiscorbutic value to one or two oranges. It also contains minerals and amino acids such as calcium, phosphorus, iron, niacin, carotene, thiamine and riboflavin. Indian Gooseberry has also been found to be low in saturated fat, sodium and cholesterol making it good for health.

The quantity of nutrient, minerals and vitamins in 100g of the food portion:

Table 1: Nutritive value of Amla

Moisture	81.8%
Calcium	50g
Carbohydrates	13.7%
Iron	1.2mg
Protein	0.5%
Carotene	9µg
Fats	0.1%
Thiamine	0.03mg
Minerals	0.5%
Riboflavin	0.01mg
Fibers	3.4%
Niacin	0.2mg
Energy	58 kilo calorie
Vitamin C	600mg

CHEMICAL CONSTITUENTS OF VARIOUS PARTS OF AMLA: [3, 6]

Table 2: Different chemical constituents present in various parts of Amla

Part	Constituent
Fruit	Alanine, Arginine, Ascorbic acid, Aspartic acid, Ash, β-carotene, Boron, Calcium, Carbohydrates, Chebulagic acid, Chebulaginic acid, Chebulic acid, Chebulinic acid, Chloride, Copper, Corilagic acid, Corilagin, Cystine, D-fructose, D-glucose, Ellagic acid, Emblicol, Emblicanin, Ethyl gallate, Fat, Fibre, Flavonoids, Gallic acid, Gallic acid ethyl ester, Gibberellin-a-1, Gibberellin-a-3, Gibberellin-a-4, Gibberellin-a-7, Gibberellin-a-9, Glucogallin, Glucose, Glutamic acid, Glycine, Glycosides, Histidine, Iron, Isoleucine, Leucine, Lysine, Magnesium, Manganese, Methionine, Myo-inositol, Myristic acid, Niacin, Nitrogen, Pectin, Phenylalanine, Phosphorus, Phyllantidine, Phyllantine, Phyllemblic acid, Phyllemblin, Phyllemblinic acid, Polysaccharide, Potassium, Proanthocyanidins, Proline, Protein, Quercetin, Riboflavin, Rutin, Selenium, Serine, Silica, Sodium, Starch, Sucrose, Sulfur, Tannin, Terchebin, Thiamin, Threonine, Trigalloyl glucose, Tryptophan, Tyrosine, Valine, Water, Zeatin, Zeatin nucleotide, Zeatin riboside, Zinc.
Leaf	Amlaic acid, Astrogalin, Ellagic acid, Gallo-tanin, Kaempferol, Kaempferol-3-o-glucoside, Phyllanthin, Rutin, Tannin.
Shoot	Chebulagic acid, β-sitosterol, Chibulinic acid, Corilagin, Ellagic acid, Gallic acid, Glucogallin, Lupeol.
Bark	Leucodelphinidin, Lupeol, β-sitosterol, Tannins.
Seed	Linoleic acid, Linolenic acid, Myristic acid, Oleic acid, Palmitic acid, Phosphatides, Stearic acid, β-sitosterol
Root	Ellagic acid, Lupeol.

PHARMACOLOGICAL AND MEDICINAL PROPERTIES: [1-14]

- Phyllembin, isolated from the ethanolic extract of the fruit pulp has been found to potentiate the action of adrenaline in vitro and in vivo. It showed a mild depressant action on Central Nervous System and also had a spasmolytic activity. Of the indirect actions, potentiation of the action of adrenaline on the blood pressure of cat, isolated frog heart, and nictitating membrane of cat and the prolongation of the hypnosis were observed.
- Further studies on the action of phyllemblin revealed that the drug antagonized the spasmogenic effect of acetylcholine, bradykinin and serotonin on the guinea pig ileum. It increased the amplitude of cardiac contraction and heart rate transiently. It protected effectively against tremors and clonic and tonic convulsions induced by nicotine. It also antagonized tremorine-induced tremors and other cholinergic symptoms.
- The effect of crude amla on total serum protein and its fractions was studied in rabbits. The drug was found to have only anabolic effect without affording resistance against diseases.
- *Emblica officinalis* extract was found to inhibit the hepatotoxicity produced by acute and chronic administration as seen from the decreased levels of serum and liver lipid peroxides (LPO), glutamate-pyruvate transaminase (GPT), and alkaline phosphatase (ALP).
- Clinical studies were conducted to investigate the effect of crude amla in gastritis syndrome. Alcoholic extract of a plant (1g/kg) has shown an increase in the cardiac glycogen and a decrease in serum GOT, GPT and LDH in isoprotenol pretreated rats, suggesting a cardioprotective action. It showed a reduction in serum cholesterol levels and a significant antiatherogenic effect.
- The crude extract of *Emblica officinalis* was reported to counteract hepatotoxic and renotoxic effects of metals due to anti-oxidant activity.
- *Emblica* was shown to reduce UV-induced erythema and had excellent free-radical quenching ability, chelating ability to iron and copper as well as MMP-1 and MMP-3 inhibitory activity.
- *Emblica officinalis* has been reported to inhibit chromium-induced free radical production, and it restored the antioxidant status back to normal level. It also inhibited the apoptosis and DNA fragmentation induced by chromium.
- It serves as anti-ageing agent, promote strength and vigor, inhibits tumor growth, antibacterial, antifungal and antiviral agent, promote healing, exhibits adaptogenic properties, immune system enhancer, cognition and memory enhancer, effective antioxidant, possess cytoprotective properties, palliative for snake bites and scorpion stings, effective antiseptic, treatment of pulmonary and renal tuberculosis, reduces serum cholesterol.
- It enhances fertility and increases sexual vigor, improves skin complexion, treatment of gonorrhea, treatment of scurvy, helps hair growth, treatment of metabolic disorders- anemia,, gout and diabetes, improves digestion, assimilation, metabolism and circulation, antinociceptive, antiepileptic, treatment of rheumatism, stabilizes blood sugar, treats hypertension, treat urinary disorders.

Table 3: Table showing the Pharmacological effect/condition and the part/preparation used

Pharmacological Effect/Condition	Part /Preparation used
Antibacterial activity	Fruit, Leaves
Antifungal activity	Fruit
Antiviral activity	Fruit
Antimicrobial activity	Fruit, Infusion and Decoction of leaves, Seeds
Anticancer activity	Fruit, Fruit juice, Leaves, Roots, Branches
Antiepileptic	Hydroalcoholic extract of *E.officinalis*
Anti-inflammatory	Amla gel, Leaves, Fruit
Antinociceptive	Fruit
Antipyretic	Roots, Decoction of leaves and seeds, Fruit
Antioxidant activity	Fresh juice, Fruits, Seeds
Antiulcerogenic	Fruit, Decoction of leaves, Bark of the root
Aperient	Fruit, Flowers
Astringent	Root, Bark, Fruit
Cardioprotective	Fruit

Cytoprotective	Fruit
Dental problems	Root, Juice of the leaves
Diabetes	Fruit, Decoction of leaves and seeds, Infusion of seeds, Amla juice mixed bitter gourd juice.
Diarrhea	Decoction of fruit, Root, Infusion of leaves, Bark.
Dysentery	Dried fruit, Paste of leaves mixed with honey /butter-milk.
Eye care	Juice with honey
Febrifuge	Infusion of seeds
Hair tonic	Dried fruit pieces boiled in coconut oil
Hepatoprotective	Fruit
Hypotensive potential	Fruit
Immunomodulatory	Fruit
Indigestion	Leaves with buttermilk
In Jaundice, Dyspepsia and Cough	Fermented liquor from fruits
In treatment of Gonorrhea	Juice of the bark combined with honey and turmeric
Lipid lowering and Antiatherosclerotic	Fruit, Fresh juice
Menstrual problems	Powdered and dried amla seeds mixed with honey and saunf
Pruritis	Seeds are burnt, powdered and mixed with oil.
Respiratory problems	Fruit, Expressed juice of fruit, Juice/extract of the fruit mixed with honey and pipli to stop hiccough.
Rheumatism	Dry fruit powder mixed with jaggery
Scurvy	Powder of the dry herb mixed with equal quantity of sugar, taken with milk.
Scabies and itch	Seed burnt, powdered and mixed with oil and apply
Skin sores and wound	Milky juice of leaves, Bark
Vaginal complaints	Mixture of fruit juice and sugar
Vermifuge	Juice of fruit with honey
Vomiting	Fruit juice mixed with honey

CONCLUSION:

Emblica officinalis scientifically, is the most widely used herb in the Ayurvedic system of medicine**.** Amla has said to be useful against many severe diseases, including cancer, diabetes, hepatic disorders and heart diseases. Different biological activities of amla include antioxidant, immunomodulatory, anticancer, cytoprotective, analgesic, antimicrobial, antipyretic, antitussive and hepatoprotective. Amla is one of the richest natural sources of vitamin C, its fresh juice containing nearly twenty times as much vitamin C as orange juice. A single tiny Amla is equivalent in vitamin C content to two oranges. It is an ingredient of many Ayurvedic medicines and tonics, as it removes excessive salivation, nausea, vomiting, giddiness, spermatorrhoea, internal body heat and menstrual disorders. It is useful for Cough, Bronchitis, and Asthma. Amla cleanses the mouth, strengthens the teeth. 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 improve intelligence and memory power. Triphala and Brahmrasayana are other classic medicine in which Amla is being used since time immemorial.

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