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Emblica officinalis (Amla): A Review for its Phytochemistry, Ethnomedicinal Uses and Medicinal Potentials

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ABSTRACT

The traditional Indian Ayurvedic medical system's most significant and widely researched plant, Emblica Officinalis (Amla), is discussed along with its preventive efficacies and safety. During an 16-week trial, 14 qualified healthy adult participants were randomly assigned to receive either amla or a placebo (400 mg daily). Vascular function, blood haematology, oxidative and inflammatory indicators, glucose and lipid profiles, urinalysis, and liver hepatotoxicity were the efficacy parameters examined. The main efficacy metric of blood fluidity significantly improved after Amla consumption. Along with a considerable increase in HDL cholesterol and a reduction in LDL cholesterol, benefits were also seen in the secondary endpoints, which included a decrease in von Willebrand factor (vWF), reduced 8-hydroxy-2'-deoxyguanosine (8-OHdG), and thrombin (TM), biomarkers of oxidative stress. After consuming amla, there were no appreciable differences in liver hepatotoxicity, urinalysis, or haematological as compared to baseline or placebo. After consuming amla, no negative side effects, changes in safety parameters, or problems with tolerance were noticed. As a result, Amla supplementation improved endothelial functioning, decreased oxidative stress, and had a tolerable palatability. The present review provided the more information regarding the scientific research and review of Emblica Officinalis (Amla).

INTRODUCTION

Amla (Emblica officinalis) (EO) is revered in the ancient Indian medical system known as Ayurveda. Indian mythology holds that Amla, a member of the Euphorbiaceae family and also known as Phyllanthus emblica or Indian gooseberry, was the first tree to be created in the universe. Amla is a native of India and also grows in Pakistan, Uzbekistan, Sri Lanka, South East Asia, China, and Malaysia in tropical and subtropical climates [1]. The fruits of the Amla tree are frequently employed in Ayurveda medicine and are thought to strengthen the body's resistance to illness [2].

It plays a positive effect in the treatment of degenerative conditions such cancer, diabetes, liver disease, ulcers, anaemia, and heart problems1 and is a crucial component of hepatoprotective formulations. Amla is incredibly nutrient-dense and one of the best sources of vitamin C, minerals, and amino acids [3]. It has a variety of chemical components, including phenols, alkaloids, and tannins. Emblicanin A and B, gallic acid, and ellagic acid are two of the four hydrolysable tannins that have been reported to have biological activity. Ayurveda and traditional medicine have both employed fruit as a potent rasayana to cure a variety of diseases, including diarrhoea, jaundice, inflammation, and several others [5]. Nearly all portions also have therapeutic qualities. In the Indian medical system, amla fruit is frequently used as a diuretic, laxative, liver tonic, refrigerant, stomachic, restorative, anti-pyretic, hair tonic, and to avoid ulcer and dyspepsia. It is also used to treat fever and the common cold.

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CLASSIFICATION

- **Kingdom: Plantae**
- **Division: Angiospermae**
- **Class: Dicotyledonae**
- **Order: Geraniales**
- **Family: Euphorbiacea**
- **Genus: Emblica**
- **Species: officinalis Geartn.**
- **Vernacular names English: Emblic myrobalan, Indian Goose berry**
- **Sanskrit: Aamalaki**
- **Hindi: Amla**

MORPHOLOGY

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-colored surface beneath the older bark. The main stem is about 70 cm in diameter. The main trunk is typically split into 2 to 7 scaffolds very close to the base [22]. The leaves are densely set in pinnate faishon3 and are 10–13 mm long by 3 mm broad, giving the branches a fluffy look. Leaves form after the fruits have set. Flowers are unisexual, 4 to 5 mm long [23], pale green in colour, and produced in clusters of 6 to 10 on the leaf axils. Fruits have a fleshy, almost globose shape, 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 divides into three segments, each of which normally containstwo seeds that are 4-5 mm long and 2-3 mm wide and weigh 572 to 590mg [23- 24].

Figure. 1:- Amla (Emblica officinalis)

CHEMICAL CONSTITUENTS:

Plants known for and extensively studied include amla. Research reveals that it contains a variety of biological elements, namely alkaloids, phenols, and tannins [23]. Fruit contains about 28% of the plant's total tannic content. These tannins, which are antioxidants by nature, are found in two hydrolyzable forms: emblicanin A and emblicanin B [24]. Emblicanin A hydrolyzes to produce ellagic acid, glucose, and gallic acid, whereas emblicanin B hydrolyzes to produce ellagic acid and glucose. Phyllemblin can also be found in this fruit

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[12]. The additional fractionation revealed the presence of numerous other phytochemical components, including geraniin, corilagin, gallic acid, and furosin [25].

AMLA USE

Metabolic Syndrome

A substantial amount of fructose-induced metabolic syndrome is present in the ethyl acetate-extracted extract of E. officinalis. According to this study's findings, E. officinalis has a significant amount of polyphenol [35].

Cardioprotective

Its primary advantage is protection from CVD, atherosclerosis, and other heart disorders, in addition to the other advantages. Only by reducing the oxidation of damaged or low-density lipoprotein (LDL) is an atherosclerosis cure conceivable. The Amla fruit's juice was confirmed to be high in polyphenol content. Also, the surgical pathological healing of the heart muscles ensured the E. officinalis' prophylactic activity. E. officinalis has heart-protective, antioxidant, and free radical scavenging activities, according to all the study and debate [36,37].

Diabetes and related Complications

Foods consumed on a regular basis help to regulate the level of diabetes. Amla (E. officinalis), like garlic, onions, and turmeric, has been shown to reduce blood sugar levels. Around 2-3 g of E. officinalis powder effectively improves the amount of HDL cholesterol and regulates the level of LDL cholesterol. Moreover, Amla fruit is used by diabetic patients to prevent the development of neuropathy [38].

Immunostimulant

We are all familiar with a number of herbs that have immune-stimulating properties. Similar to this, ascorbic acid is best found in Amla, which increases immunoactivity (i.e., makes it two times more effective) by boosting immune cells and antibodies [39].

Antimicrobial

In America and the tropics, respectively, infectious diseases account for 50% and 20% of fatalities. Since more than a century ago, chemical components derived from medicinal plants have been employed to treat microbial infections [40]. Amla (E. officinalis) extract in organic solvents (such as CHCl3 and CH3 OH) exhibits effective results against a small number of Gram-positive and Gram-negative bacteria [41]. On the other hand, Gram-positive and Gram-negative bacteria were discussed by Vijayalakshmi et al. alongside the antibacterial properties of an aqueous extract of E. officinalis fruit pulp [42]. Nonetheless, because of its antibacterial properties, E. officinalis medications will be used as affordable and secure medications in the future.

Anticancer

Because to the high concentration of polyphenol components in it, E. officinalis is superior for anticancer than other natural medicinal plants. Free radicals that damage skin are involved in the mechanisms of polyphenols' anticarcinogenic action, inflammatory response, and radiation resistance [43]. Moreover, Amla (E. officinalis) is ideal for anti-aging and is used to make skin care cosmetics [48].

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Eye disorders

E. officinalis and its tannoids are used to treat eye disease, which decreased the likelihood of oxidative stress as there was a reversal of changes with respect to lipid peroxidation, protein carbonyl content, and roles of antioxidant enzymes. A further defence against lens protein aggregation and insolubilization brought on by hyperglycemia was provided by amla [48].

CONCLUSION

Today, there is a renewed interest in studying the traditional medicinal herbs of India. Although the other medical systems are efficient, they also have a multitude of negative side effects that frequently result in life-threatening complications. Herbal medication alleviates all of these issues because it is natural. Amla, also known as Emblica officinalis, plays a significant role in Ayurveda, an ancient Indian medical system. Amla, which contains the maximum quantity of vitamin C and important nutrients, prevents a wide range of diseases due to its powerful antioxidant and biological capabilities. It can be applied to the nutraceuticals and biopharmaceuticals industries as well as as a potential food additive. Many studies have shown that different amla extracts and herbal formulations may have therapeutic benefits against a variety of disorders and have effects that are comparable to those of conventional medications. In this review, we attempted to establish the fundamental mechanisms behind the traditional and empirically supported usage of amla. Even though amla has been used for therapeutic purposes for many years, more research is urgently needed to prove its efficacy.

Research in medicinal plants has gained a renewed focus recently. The prime reason is that other system of medicine although effective come with a number of side effects that often lead to serious complications. Plant based system of medicine being natural does not pose these serious problems. Though Emblica officinalis has various medicinal applications, but it is the need of hour to explore its medicinal values at molecular level with help of various biotechnological tools and techniques. Further studies should be conducted to elucidate the molecular mechanism of interaction of various plant based drugs with human body in different diseases.

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