WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

REVIEW ON EMBLICA OFFICINALIS -WILD AND HYBRID INDIAN GOOSEBERRY

Aiswarya S Nair*[1], Amal.S.Nath *[1], Karthka.B.R *[1],Neethu.A*[1], Nayana Valsan*[1], Anusree.S*[2] , Silvia Navis*[3], Prasobh G R*[4]

[1]B Pharm student, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502
[2]Associate professor, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502
[3]HOD Department of Pharmacology , Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502
[4]Principal, Sree Krishna College of Pharmacy and Research Centre, Parassala, Thiruvananthapuram, Kerala, India. 695502
E-mail: amalviswavasantham@gmail.com

ABSTRACT

This study is about two different strains of Emblica Officinalis (amla)- which is Wild Indian gooseberry and Hybrid Indian gooseberry. Both strains of Emblica Officinalis (amla) are widely used in Ayurvedic Preparation and are believed to increase defence against diseases. Emblica Officinalis has various therapeutic benefits such as radioprotective, antidiabetic, anti-aging.

1. INTRODUCTION

Amla (Emblica officinalis) has a hallowed position in Ayurveda – an Indian indigenous system of medicine, which belongs to the family of Euphorbiaceae and is also known as Phyllanthus Emblica or Indian gooseberry[1]. Emblica officinalis fruit extract has various therapeutic benefits such as radioprotective, antidiabetic, antiaging, gastroprotective[4]. Amla is native to India and grows in tropical and subtropical regions of Pakistan, Uzbekistan, Sri Lanka, Southeast Asia, China, and Malaysia[1]. The fruits of Amla are widely used in the Ayurvedic preparation and are believed to increase defence against diseases. It has a beneficial role in degenerative diseases like cancer, diabetes, liver treatment, ulcer, anaemia, heart trouble and is an important constituent in hepatoprotective formulas available. Amla is highly nutritious and is one of the richest sources of vitamin C, amino acids, and minerals. It contains several chemical constituents like tannins, alkaloids, and phenols. Among all hydrolysable tannins, Emblicanin A and B; gallic acid, ellagic acid are reported to possess biological activity[1]. Pharmacological research reports on Amla reveals its analgesic, anti-tussive, anti-atherogenic, apoptogenic, cardio, gastro, nephron, neuro protective and anticancer properties. Amla also possess chemo preventive, radio, chemo and immunomodulatory, free radical scavenging, antioxidant, anti-inflammatory, anti-mutagenic activities[2]. Almost all parts possess medicinal properties, particularly fruit. Emblica officinalis extracts contains various antioxidant such as emblicanin A, emblicanin B, Gallic acid, ascorbic acid, ellagic acid.[3] Amla fruit is widely used in the Indian system of medicine as alone or in combination with other plants and is used to treat common cold and fever, as diuretic, laxative, liver tonic, refrigerant, stomachic, restorative, anti-pyretic, hair tonic; to prevent ulcer and dyspepsia.[1]

Amla is a well-known for its nutritional value. It is rich in polyphenols, minerals, and regarded as one of the richest source of vitamin C (200-900 mgper 100g of edible portion). Amla protects cell against free radicle damage and provides antioxidant protection[4,5] Plants and herb are mostly used to cure different disease by developing different drugs .[6,8].

Medicinal properties of Embilica *officinal is*

1. Antioxidant activity
2. Antitumor activity
3. Anti ulcer activity
4. Analgesic activity
5. Antimicrobial activity

PLANT PROFILE

2.1.1 WILD INDIAN GOOSEBERRY [3,7]

BOTANICAL NAME **:** Phyllanthus Emblica Linn.

FAMILY : Euphorbiaceae

KINGDOM : Plantae

CLASS : Dicotyledonae

ORDER : Geraniales

GENUS : Emblica

SPECIES : Phyllanthus Emblica

2.1.1.1 Vernacular Names:

English : Emblic, myrobalan-tree, Indian gooseberry

Tami : Nelli

Sanskrit :Adiphala, dhatri, amalaka, shriphala, vrittophala

Malayalam : Nelli

Hindi : Amla, aonla, onilika

Kannada : Amalaka, nelli

2.1.1.2 Morphology

A deciduous tree, small to medium in size, the average height being 5.5 meters; its bark is usually light brown to black, coming off in thin strips or flakes, exposing the fresh surface of a different colour underneath the older bark; the average girth of the main stem is 70 cm; in most cases, the main trunk is divided into 2 to 7 scaffolds very near the base.

Leaves, 10 to 13 mm long, 3 mm wide, closely set in pinnate fashion, making the branches feathery in general appearance. The leaves develop after the fruit set. Flowers, unisexual, pale green, 4 to 5 mm in length, borne in leaf-axils in clusters of 6 to 10; staminate flowers, tubular at the base, having a small stalk, gamosepalous, having 6 lobes at the top; stamens 1 to 3, polyandrous, filaments 2 mm long; pistillate flowers, fewer, having a gamopetalous corolla arid a two-branched style; both staminate and pistillate flowers are borne on the same branch, but the staminate flowers occur towards the apices of small branches. Fruits, fleshy, almost depressed too globose. 2.14 cm in diameter, 5.68 g in weight, 4.92 ml in volume, primrose yellow.

The stone of the fruit, six-ribbed, splitting into three segments, each usually containing two seeds; seeds 4-5 mm long, 2 to3 mm wide, each weighing 572 mg, 590 microliters in volume, citron green 793/3.[7]

The cultivated amla is basically a tropical fruit and is highly sensitive to temperatures below 32 °F. It is grown as an orchard crop in several parts of warmer India. There is a great demand for its fruits.

A wild strain grows in the forests of the Western Himalayas up to an altitude of 5000 ft even at places experiences mild snowfall during winter months. So, it is cold resistant. The fruits of wild amla are relatively smaller. This variant can be planted at places where the winter temperatures do not fall below 25 °F. Superior cold hardy cultivars might be produced by breeding.

The cultivated amla is basically a tropical fruit and is highly sensitive to temperatures below 32 °F. It is grown as an orchard crop in several parts of warmer India. There is a great demand for its fruits.

The flowering season was observed to occur from the middle of April to the first week of May under Sanwara (H.P.) conditions. The flowering reached its peak in the end of April.

The fruiting season of aonla is exceptionally long. The fruit in this area become fit for harvesting in December. They can be retained on the tree up to March without any significant loss in quality or yield. The picking of fruits is generally done by the villagers in February and March.

2.1.1.3 Chemical Constituents

The fruit pulp, which constitutes 90.97 per cent of the whole fruit, contains 70.5 per cent moisture. The total soluble solids constitute 23.8 per cent of the juice. The acidity of aonla is 3.28 per cent on pulp basis. The pulp contains 5.09 percent total sugars and 5.08 per cent reducing sugars. The ascorbic acid content is 1,094.53 mg per 100 ml of juice. The tannins and pectin content of the pulp is 2.73 per cent and 0.59 per cent respectively. The fruit pulp contains 0.75 per cent protein. The percentage content of the mineral elements, viz. phosphorus, potassium, calcium, magnesium, and iron are 0.027, 0.368, 0.059, 0.248 and 0.004 respectively.

CHEMICAL CONSTITUENT	PERCENTAGE YEILD
Moisture content	70.5%
Proteins	0.75%
Mineral	2.922%
Tannins	2.73%
Pectin	0.59%
Ascorbic acid	1094 mg/100 ml of juice

2.1.2 HYBRID INDIAN GOOSEBERRY

BOTANICAL NAME : Emblica officinalis Geartn

FAMILY : Euphorbiaceae

KINGDOM : Plantae

CLASS : Dicotyledonae

ORDER : Geraniales

GENUS : Emblica

SPECIES : officinalis Geartn.

2.1.2.1 Vernacular names

Hindi : Amla

English : Gooseberry, Embolic myrobalan

Kannada :Nellika

Tamil : Nelli

Malayalam : Nellimaram

Telugu : Usirikaya

2.1.2.2 Morphology

Amla tree is a small to medium sized deciduous tree with an average height of 8-18 m, with thin light grey bark exfoliating in s mall thin irregular flakes, exposing the fresh surface of a different colour underneath the older bark. The average girth of the main stem is 70 cm. In most cases, the main trunk is divided into 2 to 7 scaffolds very near to the base. Leaves are 10 -13 mm long, 3 mm wide, closely set in pinnate fashion which makes the branches feathery in general appearance. After setting of the fruit's leaves develop. Flowers are unisexual, 4 to 5 mm in length, pale green in colour, borne in leaf axils in clusters of 6 to 10. Fruits are fleshy, almost depressed to globose shape, 2.1-2.4 cm in diameter, 5.3-5.7 g in weight, 4.55.0 ml in volume. The stone of the fruit is 6 ribbed, splitting into three segments each usually containing two seeds; seeds are 4-5 mm long and 2-3 mm wide, each weighing 572 to 590 .

Amla is one of the most extensively studied plants. Reports suggest that it contains tannins, alkaloids and phenols. Fruits have 28% of the total tannins distributed in the whole plant. The 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 Phyllembein. 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. 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. Its flowers during March–April and has an extended fruiting period from October to March. The feathery leaves are linear oblong, with a rounded base and obtuse or acute apex. Leaves are simple, many subsessile, closely set along the branchlets, distichously light green having the appearance of pinnate leaves. Leaves measure about 1.8 × 0.5 cm which are closely set in pinnate fashion, making the branches feathery in general appearance. Bark is thick (12 mm), shining greyish brown or greyish green. The fruits are yellowish green, fleshy, globose, and shining and changed to light yellow or red brick when mature. The average yield of wild trees growing in the forests is 23.5 kg. Cultivation and Collection Indian gooseberry is quite hardy, and it prefers a warm dry climate. It needs good sunlight and rainfall. It can be grown in almost all types of soils, except very sandy type. The seeds are enclosed in a hard seed coat which renders the germination difficult. Seeds are soaked in water for 3–4 h and sown on previously prepared seed beds and irrigated. Excess irrigation and water logging are harmful. One-month-old seedlings can be transplanted to polythene bags and 1-yearold seedlings can be planted in the main field with the onset of monsoon. Pits of size 50 cm 3 are dug at 6–8 m spacing and filled with a mixture of topsoil and well-rotten planting is done. Irrigation and weeding are required during the first year. Application of organic manure and mulching every year are highly beneficial. Fruit yield ranges from 30 to 50 kg/tree/year when fully grown. Emblica officinalis fruit, fleshy, globose, and shining and changed to light yellow or red- brick when mature.

2.1.2.3 Chemical Constituents

Amla is one of the most extensively studied plants. Reports suggest that it contains tannins, alkaloids and phenols. Fruits have 28% of the total tannins distributed in the whole plant. The fruit contains two hydrolysable tannins Emblicanin A and B, which have antioxidant properties; one on hydrolysis gives gallic acid, ellagic acid and glucose where in the other gives ellagic acid and glucose respectively. The fruit also contains Phyllembein. 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. 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.

CHEMICAL CONSTITUENTS	PERCENTAGE YEILD
Carbohydrate	14.1
Fat	0.5
Fibers	0.1
Calcium	0.05
Vitamin C	600mg/100g
Nicotinic acid	0.2mg/100g
Moisture	81.2

REFERENCE

[1] Kaushik Vilas Kulkarni, Shrishali M Ghurghure. Indian gooseberry (Emblica Officinalis):Complete pharmacognosy review. International Journal of Chemistry studies.2018;2(2):5-11.

[2] Swetha Dasaroju, Krishna Mohan Gottumukhata. Current Trends in the Research of Emblica Officinalis(Amla): A Pharmacological Perspective. International Journal of Pharmaceutical Science Review and Research.2014.

[3] Dr. Ramesh Tewani, Dr. Jitendra Kumar Sharma, Dr. S. V. Rao. Indian Gooseberry(Amla) Natural Purgative. International Journal of Applied Research and Technology.2017: 2(2).

[4] Alagar Raja M, Shailaja V, David BanjiK. N.V. Rao, Selvakumar.D. Evaluation of standardization parameters, pharmacognostic study, preliminary phytochemical screening and in vitro antidiabetic activity of Emblica officinalis fruit as per WHO guidelines. Journal of pharmacognosy and phytochemisry.2014:3(4):21-28.

[5] Virendra Yadav, Brijesh Duvey, Shobha Sharma, Babil Devi. Amla (Emblica Officinalis)-Medical Food and Pharmacological Activity. International Journal of Pharmaceutical and Chemical Sciences.2014.

[6] Syeda Mona Hassan, Shahzad Sharif Mughal, Asma Aslam, Maryam Mushtaq, Muneeza Munir, Sumaira Pervez, Nageena Shabbir, Ali Raza Ayub, Muhammad Farman. Emblica Officinalis(Amla): A Prospective Review on Distinctive Properties and Therapeutic Applications of Amla. Multidisciplinary Academic Journal Publication

[7] Sreya Talreja, Sonam Kumri, Prateek Srivasava and Swarnima Pandey. A Complete Pharmacognostic Review on Amla. World Journal of Pharmacy and Pharmaceutical Sciences.12 March 2019.

[8] K. H. Khan. Roles of Emblica officinalis in Medicine-A Review. IDOSI Publication.2009.

[9] Sneha Sehwag, Madhu sweta Das. Antioxidant Activity: An Overview: Research& Reviews: Journal of Food Science & Technology.(2013) 1-10.

[10] W. Brand-Williams, M. E. Cuvelier, C. Berset . Use of free Radical Method to Evaluate Antioxidant Activity.199.