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Accessible Bioactive Compounds and Health Benefits of Amla (*Emblica officinalis*)

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INTRODUCTION

Amla has found its important position in the Indian indigenous system of medicine like Ayurveda since a very long period of time. It is widely grown in tropical and sub-tropical parts of the world viz. India, Pakistan, China, South East Asia and Iran (Vasudevan and Parle, 2007). Amla has an important role in ayurvedic medicine for treatment of anxiety and other problems related to digestion and skin, improves, anemic conditions, improve functioning of liver and has a positive effect on cardio-vascular system of body (Asmawi, 1992). Presence of polyphenols, Vitamin-C amino acids, minerals and other bioactive compounds makes the amla fruit a natural source of anti-oxidant. It is small to medium sized deciduous tree and the height of plant ranges from 8 to 18 meter with light grey bark, leaves are simple and light green, flowers are greenish yellow. Fruits have 6 vertical furrows and are globose, fleshy and pale yellow in colour (Parmar and Kaushal, 1982). Amal is frequently used for the Industrial processing for the preparation of various kinds of products in the Industry at large scale (Pareek, 2011). Most of the products of amla like Jam, pickle, Chawanprash, candy, digestive powder etc. are available in the marker as Ayurveda product (Singh, 2003).

Figure 1. Fresh fruit of the Amla

Fruiting season:

As amla is a deciduous tree, new shoots starts emergence during the start of April. The fruiting period lies between December to March and sometimes extending up to April. The tree of amla is heavy bearer and fruits generally remain free from the attack of birds and insects. The harvesting of the fruit gives maximum yield during January to March.

Nutrient composition in Aonla

Amla serves as source of carbohydrates, fibres, proteins and minerals like Iron, Calcium and Phosphorous. It is rich source of Vitamin-C, Emblicinin A and B which have anti-oxidant properties (Barthakur and Arnold, 1991). The chemical composition and nutrients availability in amla fruit is mentioned in table 1.

Table 1. Nutritional composition of Amla (Shwetha and Krishna, 2014)

Nutrient composition	Quantity
Moisture	81.2 %
Protein	0.5 %
Fat	0.1 %
Fibre	3.4 %
Carbohydrate	14.1 %
Calcium	0.05 %
Phosphorous	0.02 %
Iron	12 µg/g
Vitamin-C	6 mg/g

Bioactive compounds in Aonla

Amla has been found to be a rich source of different types of bioactive compounds. Polyphenols comprise the main group of secondary metabolites wherein several compounds belonging to phenolic acids, flavonoids, tannins, other phenolics and derivatives compounds have been reported in different studies (Liu, et al., 2008). The amla fruit also includes numerous bioactive components including isostrictiniin, ellagic acid, apigenin, chebulinic acid, quercetin, gallic acid, chebulagic acid. The tannins also found in the fruit extract of amla arepedunculagin, emlicanin A, phyllaemblicin B, emblicanin B and punigluconine . 100 g of edible fruit have been reported to be 470–680 mg of Vit. C (Bansal, et al., 2015). A composite list of bioactive coumpounds present in amla has been given in table 2.

Table–2: Classes of chemical compounds in amla

Classes	Compounds
Alkaloid	Phyllantine, phyllantidine, zeatin, zeatin nucleotide, zeatin rioside
Benzoid	chebulic acid, chebulinic acid, chebulagic acid, gallic acid, ellagic acid, amlaic acid, 3-6-di-O-galloyl-glucose, ethyl gallate, b-glucogallin, 1,6,di-O-galloyl-b-D-glucose, putranjivan A, digallic acid, phyllemblic acid, emlicol, galacteric acid
Diterpene	gibberellin A-1, gibberellin A-3, gibberellin A-4, giberellin A-9
Triterpene	lupeol
Flavonoid	Leucodelphinidin, kaempherol, kaempherol-3-glucoside, rutin Quercetin, kaempherol-3-O- β -D-glucoside, quercetin -3-O- β -D glucoside
Furanolactone	Ascorbic acid
Sterol	β-sitosterol

Health Benefits

Apart from use of amla in the preparation of ayurvedic medicines, it plays a significant role in curing various ailments like liver diseases, digestion related problems, treatment of diabetes and cancer. In several studies the anticancer potential of six phenolic compounds isolated from Amla fruit by in vitro proliferation assay (Adil, et al., 2010). MTT method was used to study the effects of these compounds on splenocyte proliferation and the cytotoxicity to both human breast cancer cell (MCF-7) and human embryonic lung fibroblast cell (HELF) (Krishnaveni and Mirunalini, 2012). Amla promotes immune system functioning, a rich source of vitamin-C, antioxidants, increases hair growth, etc (Hussain, et al., 2021).

CONCLUSION

Amla is the well-known fruits of the tropical and subtropical region of the world, mostly planted for the fruit production. Amla is the potent source of vitamin – C that can prevent cellular damage of our body. Minerals and vitamins found in amla fruit acts as antioxidant for human body and gives glow to the skin. Amla juice is well-known for health hair growth also prevent hair fall (Yokozawa, et al., 2007). In several studies, amla fruit have found to be one of the important fruit and play crucial role in the control of cancerous cell (Khan, 2009). It may also protect our boy from oxidative damage. High blood pressure and cardio-vascular diseases can also be control using fresh fruit and by-product of the amla. In several studies related to Ayurveda, amla fruits have been found to be one of the potent immunity boosters and provide strength to the peoples for optimizing the immunity level up to certain level.

REFERENCES

Adil, M.D., Kaiser, P., Satti, N.K., Zargar, A.M., Vishwakarma, R.A., Tasduq, S.A. (2010). Effect of *Emblica officinalis* (fruit) against UVB-induced photoaging in human skin fibroblasts, *Journal of Ethnopharmacology*, 132(1), 109-14.

Asmawi, M.Z. (1992). Anti-inflammatory effects of *Emblica officinalis* Gaertn leaf extracts, *J. Pharmacol*. 45(6), 581-4.

Bansal, V., Sharma, A., Ghanshyam, C., Singla, M.L. (2015). Rapid HPLC Method for determination of vitamin C, phenolic acids, hydroxycinnamic acid, and flavonoids in seasonal samples of Emblica officinalis juice. J. Liq. *Chromatogr. Relat. Technol.* 38, 619–624.

Barthakur, N. and Arnold, N.P. (1991). Chemical analysis of emblica (*Phyllanthus emblica* L.) and its potential as a food source, *Sci. Horti.* 47 (1-2), 99-105.

Hussain, S.Z., Naseer, B., Qadri, T., Fatima, T., Bhat, T.A. (2021). Anola (*Emblica officinalis*): Morphology, Taxonomy, Composition and Health Benefits. In Fruits Grown in Highland Regions of the Himalayas; Hussain, S.Z., Naseer, B., Qadri, T., Fatima, T., Bhat, T.A., Eds.; Springer: *Cham, Switzerland, pp.* 193–206. ISBN 30755027_15.

Khan, H. (2009). Role of *Emblica officinalis* in medicine, *Bot Res. Int.* **2**(4), 218-228, http://www.idosi.org/bri/2(4)09/1.

Krishnaveni, M., and Mirunalini, S. (2012). Chemopreventive efficacy of *Phyllanthus emblica* L. (amla) fruit extract on 7,12-dimethylbenz(a)anthracene induced oral carcinogenesis – A dose–response study, *Environmental Toxicology and Pharmacology*, 34(3),801-10.

Liu, X., Cui, C., Zhao, M., Wang, J., Luo, W., Yang, B., Jiang, Y. (2008). Identification of phenolics in the fruit of emblica (*Phyllanthus emblica* L.) and their antioxidant activities. *Food Chem.* 109, 909–915.

Pareek, S. (2011). Aonla (*Emblica officinalis*); Post harvest biology and technology of tropical and subtropical fruits, Extrusion system International USA Abstract.

Parmar, C. and Kaushal, M.K. (1982). *Emblica officinalis*. In wild fruits. New Delhi; *Kalyani Publisher;* 26-30.

Singh, I.S., (2003). Production and post-harvest technology of Aonla, *Res. Bull. Directorate of Res.* NDUA & T, Kumarganj, Faizabad, 2003.

Vasudevan, M., and Parle, M. (2007). Memory enhancing activity of Anwalachurna (*Emblica officinalis* Gaertn.): *An Ayurvedic preparation, Physiology & Behaviour*, 91(1), 46–54.

Yokozawa, T., Kim, H.Y., Kim, H.J., Tanaka, T., Sugino, H., Okubo, T., Chu, D., Juneja L.R. (2007). Amla (*Emblica officinalis*Gaertn.) Attenuates Age-Related Renal Dysfunction by Oxidative Stress, *Journal of Agricultural and Food Chemistry*, 55, 7744-52.