

Role of Indian Gooseberry (*Phyllanthus emblica*) in Disease Prevention

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Abstract: *Phyllanthus emblica*, commonly known as Amla or Indian Gooseberry, is a marvellous gift of nature in the world of pharmaceuticals. A gem that has existed abundantly in the South-east Asian region, Amla has been tapped for its rich pharmaceutical properties over the ages. It is arguably one of the most important medicinal plants used in traditional medicine practices like ayurveda and Unani. Just like other medicinal plants such as neem, Tulsi, etc. various parts of the Amla plant can be utilised for pharmaceutical research and application. However, the fruit has the most utility. It can be used on its own or in the form of a concoction with other plants or chemicals to enhance its properties. The list of pharmaceutical properties of Amla seems to have no end. From being used for curing the most basic common colds and fevers to working as an adept anti atherosclerotic, this little berry can do it all. In this paper, we will be discussing some of the therapeutic properties of Amla verified by modern medicine.

Keywords: Amla, Antioxidant, Anti-diabetic, Cardio-protective

Introduction

Amla, a citrus plant found pronouncedly in the Southeast Asian region is a storehouse of phytochemicals. This makes it a strong candidate for being used as a natural substitute to already existing chemical

medications. Although it has been in use for centuries in Ayurvedic and Unani medicinal practices, it is difficult for people to recognize it in mainstream medicinal practice due to a lack of proper scientific research backing it up. It is only recently that scientists

are looking in to the plethora of benefits Amla has to provide. Amla, on its own or in the form of a mixture with other components, can be used for curing diseases like the common cold, influenza and fever. It serves as an effective diuretic, laxative, antipyretic, anti-inflammatory, antiatherogenic, anti-atherosclerotic, antitussive, and anti-hypercholesterolemia. Amla is rich in Vitamin C and several other integral phytochemicals like gallic acid, ellagic acid, pyrogallol, norsesquiterpenoids, corilagin, geraniin, elaeocarpusin, prodelphinidins B1 and B2. Amla has shown effective results as an enriching hair tonic and has been in use in South Asian households for ages in haircare products. It is also used to prevent peptic ulcers and dyspepsia and also as an excellent liver-cleansing tonic. In this paper, we have glossed over the 5 main properties of Amla that have attracted considerable attention in medicinal research.

Antioxidant activity

This is the most renowned property of Amla. The presence of Vitamin C bound to tannins (which prevents its degradation in the presence of sunlight) is the main reason for this property. It also contains antioxidants like ellagic acid & ethyl gallate in large quantities. Amla extract has been tested to

reveal its ability to chelate Fe^{3+} & copper, inhibit MMP-1 & MMP-3, scavenge DPPH & OH radicals, inhibit genetic mutations & repair chromosomal abnormalities. It was found to induce the body's natural antioxidant defense system (consisting of GSH, GSH-reductase, GSH S-transferase, GPx, SOD & CAT). Due to its high Vitamin C content, it is also recommended to treat scurvy. Administration of Amla extract in humans is found to reduce peroxidation levels & oxidative damage. In mice Amla extract has been found to reduce lipid peroxidation. Hence it is being touted as a new source of bioactive compounds to manage metabolic syndrome.

Neurological improvement

Studies have observed that Amla fruit extract is effective in reducing $AlCl_3$ -induced neurotoxicity & acting against amnesia artificially induced by application of drugs like diazepam & scopolamine in rats. As a wide range of Amla metabolites (notably emblicanin A & B) have been found to reduce phosphorylation of tau proteins & acetylcholinesterase activity in brain, the plant is being considered as a potential source for new drugs to treat Alzheimer's disease. A weak antidepressant activity of Amla extract has also been recorded. It is noteworthy to

mention that better results have been obtained from unripe fruits compared to ripe ones.

Cardio-protective activity

Studies have found that the administration of Amla fruit extract can significantly reduce the levels of LDL & oxidized LDL in the blood of rats fed with a high-cholesterol diet. Reduction in serum cholesterol levels in humans diagnosed with hypercholesterolemia by the application of Amla fruit extract has also been recorded. Its application in treating Atherosclerosis is being considered due to its ability to reduce CRP levels and increase HDL concentration. Although different studies indicate that Amla can reduce VLDL and LDL levels in humans, a study conducted on mice administered its ethanolic extract showed that while it was effective in reducing serum triglycerides levels, no such effects were observed in case in VLDL

Anti-Diabetic activity

Amla's antidiabetic property is attributed to its high ascorbic acid content which reduces the activity of enzymes like amylase and glucosidase. Amla tannins are shown to be effective against non-insulin-dependent diabetes by enhancing glucose uptake and inhibiting adipogenesis. Ellagic acid, another Amla metabolite has shown promising results

in controlling diabetes in mice. Similar outcomes have also been obtained in the case of regular administration of Amla powder to diabetic patients.

Gastro-protective Role

Amla has shown promising gastro-protective activity. Polyphenols present in it have shown the ability to inhibit the growth of *Helicobacter pylori*, a bacterium responsible for causing gastric ulcers. Amla extract has also been shown to be effective in preventing artificially induced gastrointestinal ulcers in rats. Further tests on mice have also given positive outcomes in treating non-alcoholic fatty liver disease, pancreatitis & colitis, artificially induced in mice.

Conclusion

With more and more research being done using Amla, the vast potential it holds as a medicinal plant is being brought to the limelight. This is opening up opportunities for integrating Amla in the mainstream medical field. This is a big step in today's world where in people are on the constant hunt for finding more natural, non-toxic therapeutic agents to replace the current chemical ones in the market as an approach towards a better and more sustainable lifestyle.

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