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By

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ISSN 2319-3077 Online/Electronic

ISSN 0970-4973 Print

UGC Approved Journal No. 62923

MCI Validated Journal

Index Copernicus International Value

IC Value of Journal 82.43 Poland, Europe (2016)

Journal Impact Factor: 4.275

Global Impact factor of Journal: 0.876

Scientific Journals Impact Factor: 3.285

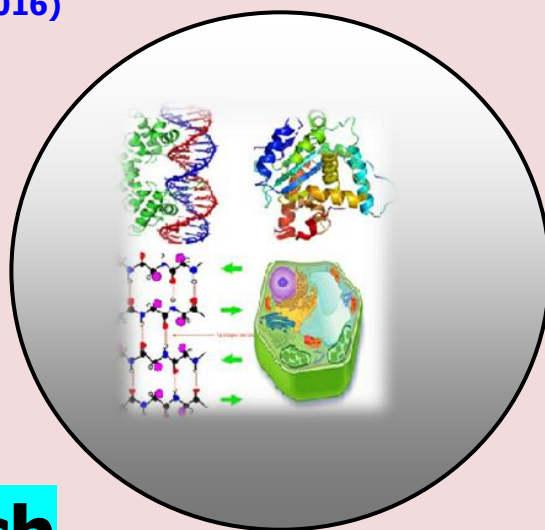
InfoBase Impact Factor: 3.66

J. Biol. Chem. Research

Volume 35 (2) 2018 Pages No. 1066-1073

Journal of Biological and Chemical Research

An International Peer Reviewed / Referred Journal of Life Sciences and Chemistry



Indexed, Abstracted and Cited in various International and National Scientific Databases

Published by Society for Advancement of Sciences®



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RESEARCH PAPER

Received: 25/11/2018

Revised: 29/12/2018

Accepted: 29/12/2018

Therapeutic uses of *Embolica officinals* for Human Health: An Overview

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ABSTRACT

Amla is the greatest boon to the humanity and one of the effective traditional herbal medicines, which had been used to treat and manage diseases since the ancient times. Hardly any people are unaware about its importance and significance as it is associated with multiple health and medicinal benefits. Indian Gooseberry is the reservoir of minerals, vitamins and other bio-chemical substances. To some extent, it is bitter in taste but the ayurvedic marvel can be used in many forms such as eaten raw, juice, chutneys, pickles, Murabbas, and used with other recipes using its powder. Embolica officinalis is a superb antioxidant. It belongs in the pantheon of rare super berries, and its antioxidant abilities create a deep foundation for its unique healing properties. Reports suggest that it contains a wide range of tannins, alkaloids, and phenolic compounds, all with the ability to quench a wide range of reactive oxygen species. As for its unique array of potent healing molecules, get ready for a long list of names (some familiar, some mind-numbingly unpronounceable), Active molecules include gallic acid, ellagic acid, quercetin, chebulinic acid, chebulagic acid, emblicanin A, emblicanin B, punigluconin, pedunculagin, citric acid, ellagotannin, trigallayl glucose, pectin, 1-Ogalloyl-b-D-glucose, 3,6-di-O-galloyl-D-glucose, chebulagic acid, corilagin, 1,6-di-O-galloyl-b-D-glucose, 3 ethylgallic acid and isostrictiniin, kaempferol 3 O- α -L rhamnopyranoside and kaempferol 3 O- α -L rhamnopyranoside.

Keywords: Gallic acid, Ellagic acid, Quercetin, Adaptogenic Hypertension, Cholesterol, Diabetes, Influenza and Tannins, alkaloid.

INTRODUCTION

The Amla berry (*Embolica officinalis*) is a traditional food and medicine that inspires we in the mind of the serious herbalist due to its many known nutritional and medicinal benefits and uses. In India it is common to eat gooseberries steeped in salt water and turmeric to make the sour fruits palatable. There are two varieties of Amla - cultivated (gramya) and wild (vanya). The wild amla is small while cultivated amla is big, smooth and juicy. Chemical composition of the amla fruit contains more than 80% of water.

It also has protein, carbohydrate, fiber and mineral and also contains gallic acid which is a potent polyphenol. Vitamin C is important for human beings. It is necessary for the synthesis of the inter-cellular cementing substance which is responsible for keeping the cells of the body together. The amla fruit is reported to contain nearly 20 times as much vitamin C as orange juice. The edible amla fruit tissue has 3 times the protein concentration and 160 times the ascorbic acid concentration of an apple. The fruit also contains higher concentration of most minerals and amino acids than apples. Amla fruit ash contains chromium, Zinc and copper. It is considered as adaptogenic that improves immunity. The tree is small to medium sized reaching 8 to 18 m in height with a crooked trunk and spreading branches. The branch lets are glabrous or finely pubescent 10-20 cm long usually deciduous. The leaves simple, sub sessile and closely set along branch lets, light green, resembling pinnate leaves. The flowers are greenish-yellow. The fruit is nearly spherical, light greenish yellow, quite smooth and hard on appearance with 6 vertical stripes or furrows. Ripening in autumn the berries are harvested by hand after climbing to upper branches bearing the fruits. The taste of Indian gooseberry is sour, bitter and astringent and is quite fibrous (Patel and Goyal, 2011, Chen et al., 2011, Nampoothiri et al., 2011).



Figure 1. Showing *Emblica officinalis* Fruits.

Emblica officinalis is a natural, efficacious antioxidant with the richest natural source of Vitamin C (200-900 mg per 100 g of edible portion). Numerous studies conducted on *Emblica officinalis* fruit suggest that it has anti-viral properties and also functions as an anti-bacterial and anti-fungal agent. The gelatinous plum-sized Amla fruit contains naturally occurring vitamin, heat stable vitamin C. A clinical study on patients with pulmonary tuberculosis showed that the vitamin C contained in *Emblica officinalis* was better assimilated than synthetic vitamin C. Further research of contemporary and traditional medical literature indicates that *Emblica officinalis* either in combination with other herbs or alone has been useful in the amelioration of colds, warts, skin afflictions, influenza, anemia, diabetes, lung conditions, elevated cholesterol and as an immune restorative in cancer conditions (Sabu and Kuttan, 2002).

It is one of the best natural antiageing remedies. *Emblica officinalis* is amazingly effective natural antiageing product. *Emblica officinalis* is very effective in treatment of acidity and peptic ulcers. *Emblica officinalis* is rich in Vitamin C, Calcium, Iron, essential amino acids and many other vitamins and minerals and anti-oxidants. Regular use of *Emblica officinalis* improves immunity, fight against cancers, chronic diseases like hypertension, high Cholesterol, Diabetes, influenza, Chronic cough and cold, Chronic infections, Chronic fatigue and Chronic inflammatory conditions. Ayurveda describes it as one of the best herbs for Diabetes, bleeding disorders, strength and stamina promoter (Singh et al., 2011).

PHARMACOLOGY AND CLINICAL STUDIES

Phyllembin is 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 action. *Emblica officinalis* Depressant action on Central Nervous System and also has a spasmolytic activity.

The drug also revealed mild stimulant action on isolated frog heart, short and insignificant rise in cat's blood pressure, contraction of the nictitating membrane the reduction of outflow of the perfusate in the hind limb of the rat and ear of rabbit, mild cerebral depressant action and anti-spasmodic 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 guineapig ileum. It also antagonized serotonin and acetylcholine-induced contractions of oestrogenised rat uterus. It increased the amplitude of cardiac contraction and heart rate transiently (Srivasuki, 2012, Kumar et al., 2012).



An increase in coronary flow was followed by persistent decrease. On perfused rat hind limb and rabbit ear preparation, phyllemblin in small doses increased the amount of perfusate whereas in larger doses it decreased the flow significantly. A triphasic response that is initial transient rise followed by a transient fall and then sustained rise in blood pressure was seen in anaesthetized albino rats. The sustained rise was blocked by phentolamine (1mg/kg.). The drug produced 80 percent protection against leptazol seizures in mice. It protected effectively against tremors and clonic and tonic convulsions induced by nicotine. It also antagonized tremorine-induced tremors and other cholinergic symptoms. The ether extract and 80 percent alcoholic extract of fruits acidified with hydrochloric acid were found to have antibacterial activity (Prajapati et al., 2009, Arora et al., 2011).



The other extract of acidified alcoholic extract showed the highest activity inhibiting the growth of *M. pyogenes*, *S. typhosa* and *S. paratyphi* at a concentration of 0.21mg /ml and that of *M. pyogenes*, *S. schottmmellari* and *S. dysenteriae* at a concentration of 0.42mg/ml³. The effect of crude amla (traditionally known as amalakirasayana) on total serum protein and its fractions was studied in rabbits.

The drug had no significant effect on the levels of serum protein fractions but it raised the total protein level and increased the body weight. The studies indicated that the increase in the body weight was due to positive nitrogen balance. The drug was found to have only anabolic effect without affording resistance against diseases (Krishnaveni et al., 2011).

Clinical studies were conducted to investigate the effect of crude amla in gastritis syndrome. The crude amla was given in 20 cases in a dose of 3 gms 3 times a day for 7 days. The drug was found effective in 85% of the cases. It was observed that the drug did not have any significant beneficial effect in cases of hypochlorhydria only cases of hyperchloridia with burning sensation in abdominal and cardiac regions and epigastric pain were benefited. 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 isoproterenol pretreated rats suggesting a cardioprotective action. It showed a reduction in serum cholesterol levels and a significant antiatherogenic effect. This study suggests that Vitamin C content alone may not responsible for the antiatherogenic effect of the animals. The lipid lowering and antiatherosclerotic effects of amla fresh juice were evaluated in cholesterol fed rabbits (rendered hyperlipidemic by atherogenic diet and cholesterol feeding) (Chopra et al., 2002, Nath et al., 2002, Namita and Mukesh, 2012, Anonymous, 1997).

ADVANCE PHARMACOLOGICAL STUDIES

The antibacterial activity of aqueous crude extracts of *Emblica officinalis*, against five human bacterial pathogens were studied. The data clearly shows that the aqueous crude extract of *Emblica officinalis* possess strong inhibitory action against all the test bacterial pathogen. Chondro protective activity Sumantran VN et al. measured the chondro protective potential of fruit extracts of *P. Emblica* in osteoarthritis. The data provided a pilot pre- clinical evidence for the use of *P. Emblica* fruits as a chondroprotective agent in osteoarthritis therapy. Insulin sensitizing activity Kalekar et al. evaluated the insulin sensitizing activity of *Phyllanthus emblica* by assessing glucose uptake activity in a 3T3L1 adipocyte model, they found that *Phyllanthus emblica* significantly stimulated glucose uptake in 3T3L1 adipocytes in a dose dependent manner with maximal effect at higher concentration. Induction of apoptosis the effects of *Emblica officinalis* extracts on induction of apoptosis of human primary osteoclasts were studied by Letizia Penolazzi et al. according to the result of this in vitro study, the extracts of *Emblica officinalis* were able to induce programmed cell death of mature osteoclasts without altering the process of osteoclastogenesis (Huang, 1999, Khopde et al., 2001).



Antioxidant activity Khopde et al. examined aqueous amla extract for its ability to inhibit g-radiation-induced lipid peroxidation in rat liver microsomes and superoxide dismutase damage in rat mitochondria. Based upon the results it is concluded that amla is a more potent antioxidant than vitamin C. Gastroprotective activity Mehrotra et al. reported a novel property of ethanolic extract of *Emblica officinalis* (amla) fruit pulp in inhibiting the growth of *Helicobacter pylori* in-vitro, and recommended it suitable for a therapeutic use against *H. pylori* infection and gastric ulcer. Hypolipidemic effect Gopa, Bhatt and Hemavathi evaluated the efficacy of Amla in patients with type II hyperlipidemia and compare its hypolipidemic effects with those of simvastatin. Amla produced significant hypolipidemic effect along with a reduction in blood pressure (Gopa et al., 2012).

Hepatoprotective activity Hepatoprotective activity of *Emblica officinalis* (EO) and Chyavanaprash (CHY) extracts were studied using carbon tetrachloride (CCl₄) induced liver injury model in rats. EO and CHY extracts were found to inhibit the hepatotoxicity. Antitumour activity E.O and chyavanaprash (a non-toxic herbal preparation containing 50% E.O) extracts were found to reduce ascites and solid tumours in mice induced by DLA cells. Anti-inflammatory activity Anti-inflammatory effects of phenolic compounds from *Emblica officinalis* were evaluated by Muthuraman, Sood and Singla in carrageenan and cotton pellet induced acute and chronic inflammatory animal model (Jose and Kuttan, 2000).

They concluded that phenolic compounds of *E. officinalis* may serve as potential herbal candidate for amelioration of acute and chronic inflammation due to their modulatory action of free radicals. Antimicrobial activity Sabahatsaeed and Perweentariq investigated antimicrobial potential of aqueous infusions and aqueous decoctions of *Emblica officinalis* (amla), and found it effective against *Staphylococcus aureus*, *S. haemolyticus*, *S. saprophyticus*, *Micrococcus varians*, *M. Lylae*, *M. roseus*, *M. halobius*, *M. sedenterius*, *Bacillus subtilis*, *B. Megaterium* and *Candida albicans*. Anti-pyretic and analgesic activity James et al. investigated the anti-pyretic and analgesic activity of ethanol and aqueous extracts of *Emblica officinalis* fruits in several experimental models. Their findings suggested that extracts of *Emblica officinalis* fruits possess potent anti-pyretic and analgesic activity (Jose et al., 2001, Muthuraman et al., 2011, Perianayagama et al., 2004).



CONCLUSION

Amla is good to prevent hair loss, hair fall and plays a vital role in the overall health of hair. Drinking of Amla juice is good to prevent hair fall, hair loss, dandruff and split ends because of abundance in protein. The mix of juices of amla and lemon when apply over the scalp and left it for 20 minutes followed by washing helps to strengthen the hair follicles and hair shaft. It also enhances hair lustre, color and pigmentation. Regular intake of Amla juice makes your hair darker and thicker and also prevent greying.

Applying the paste of amla helps to make your hair grow and dark color. Amla prevents baldness due to the presence of carotene and iron. Amla ensures proper absorption of calcium that directly or indirectly beneficial for lustrous hair including bones, teeth and nails. It is good for skin beauty. The application of Amla juice over the face helps to fight wrinkles, pimples, acne etc. Drinking of the juice is equally beneficial to make your skin glow. It makes your skin fresh by removing the dead cells when applied externally. Amla is good for weight loss, fat burning and those who are obese. It has the higher level of amino acid that helps to shed unnecessary fats from the body. Amla is diuretic in nature, means it increases the frequency and amount of urine thereby releasing of toxins, waste products from the body. Since urine is also composed of fat. Releasing more urine means shedding more fats from the body. Amla prevents many eye related problems such as cataract, nearsightedness, intra-ocular, vision improvement, etc. The presence of vitamin A and carotene overcomes many problems related with eyes.

It helps to cure mouth ulcer if it gargles along with water. Amla stimulates the pancreas Islet of langerhans which further regulate the suitable secretion of insulin hormone. Regular intake of amla means you are making your heart healthy and fit. It lowers the level of cholesterol and strengthens the cardiac muscles thus smooth pumping of blood and oxygen to the entire body. The presence of chromium prevents plaque formation in the blood vessels thus save you from strokes and cardiac problems. Iron content ensures more oxy-haemo circulation. The various bio-chemical substances present in it ensure the better functioning of heart by maintain blood pressure and preventing strokes. It is good for digestion and assimilation of foods. It ensures to flush out toxins from the body, being alkaline in nature, balances and strengthening the digestion process. It has adequate amount of fiber and roughage that make you relieve from constipation and indigestion. *Emblica officinalis* is a superb antioxidant. It belongs in the pantheon of rare super berries, and its antioxidant abilities create a deep foundation for its unique healing properties. Reports suggest that it contains a wide range of tannins, alkaloids, and phenolic compounds, all with the ability to quench a wide range of reactive oxygen species. rhamnopyranoside.

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