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A Review Paper on Medicinal Properties of *Phyllanthus emblica*

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Abstract

The plant names phyllanthus emblica linn (Amla) are very precious gift of nature which have a vital role in health care. Nowadays, use of herbal product become most important for humans over the world. This drug is very useful for the treatment of disease. The most important part of this plant (phyllanthus emblica) is fruit. The research done by a various researcher on phylanthus emblica found at it is analgesic, antioxidant, antidiabetic, antipyretic etc. The top most productive countries are Bangladesh (2.27 %), Japan (1.73%) and China (1.4%) during 2008 to 2017. Many diseases are treated by the fruit which is used either alone or in combination with other plant. These include common cold, fever, diuretic, laxative, stomachic, ulcerative and also in peptic ulcer and most important digestive. My review summarize the result related to those properties and also enlightment the aspect for future research and their activity for preventive in human.

Keywords
Phyllanthus emblica, Chemical constituent, Medicinal activity, Amla.

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1. INTRODUCTION:

Medicinal plant is the gift for all the creatures which is obtained from the nature. The main role towards the humans for treatment in various diseases in the human. In the survey of who it is found that 80% of the population of developing countries are depend on medicinal plant. Amla which is also known as Indian goose berry which is a gift of nature to the mankind. This phyllanthus emblica is the one of the most selling crude drug in the market. Mostly its fruit part which have diverse application in a healthcare food and cosmetic industry. Amla is also used in various formulations for example triphala which is an ayurvedic preparation and it composed of a terminalia chebula, phyllanthus emblica and terminalia belerica. **(1)**

This fruit is widely used as a medicine, as diuretic, laxative and liver tonic. Amla is a very important source of vitamin c and amino acid mostly every part of amla is used for medicinal purpose especially the fruit part. **(2)**

Amla is a main herbal drug utilize in ayurvedic as well as unani system of medicine. Amla is also used as a

tonic to maintain the lost energy in a human body. (3)

Amla also contain several chemical constituents like gallic acid ellagic acid are reported which shows biological activity. The property of amla is also used in treatment and prevention of atherosclerosis and various other disorder. (4)

This review paper has covered all the medicinal aspect of plant emblica officinalis belonging to family euphorbiaceae.

2. GEOGRAPHICAL DISTRIBUTION:

Phyllanthus emblica is found all over the India. It is found in the sea coast district and on hill slope upto 200 meter. The amla cultivated in plains and also grows in the marginal soil and different kinds of degraded lands such as salt affected soil and dry and semi-dry regions. This plant is common in tropical and subtropical India. It is found widely in deciduous forest of Madhya Pradesh. (5)

It is also found in countries like China, Indonesia, Burma and on the Malai peninsula. It is also native to tropical southern east Asia particularly in central and southern India and in countries like Nepal, Pakistan, Bangladesh, Bhutan, Srilanka, and Mascarene island. It is originally being cultivated in Madascar. In more region of Indian subcontinent like Uzbekistan, Malaysia, Ceylon, Indonesia and some other countries of world. The cultivation of amla (Phyllanthus emblica) is about 200 trees and can be accommodated per acre. (1)

2.1. GEOGRAPHICAL MAP OF PHYLLANTHUS MAP IN SOUTHERN INDIAN (8)

3. BOTANICAL DESCRIPTION OF PLANT PHYLLANTHUS EMBLICA:

3.1. Fruit:

Phyllanthus emblica is small to medium size fruity tree. The fruit is ripened in autumn season and sour, bitter as well as astringent in taste. **(1)**

Pale yellow, depressed, fleshy about 2cm in diameter with 6 vertical furrows enclosed in six trigonus seeds. **(6)**

3.2. Bark:

Height is about 8-18 metre with light grey in color. **(1)** It also has small irregular flakes. **(6)**

3.3. Flower:

The flower of phyllanthus emblica are yellowish green, unisexual and have 6 vertical strip. **(1)**

The male flower is unisexual and slender and pedicels, females few, ovary are three. **(6)**

4. MICROSCOPIC FEATURE OF PHYLLANTHUS EMBLICA:

The transverse portion of amla (Phyllanthus emblica) mature fruit shows an epicarp such as 4 layer of hypodermis (pair) and single layer of skin. **(6)**

BARK (6)

FLOWER (6)

FRUIT (6)

5. VERNACULAR NAMES:

English – Emblic myrobalan, Indian gooseberry
Marathi – Amla
Gujrati – Ambala
Malayalam – Nelli kayi
Telugu – Usirikaya
Kashmiri – Aomla
Chinese – Anmole
French – Phyllanthe emblica
German – Amla
Italian – Mirabolena emblico
Sanskrit – Dhatri phala, Amla
Malaysian – Popok, Melaka
Orissa – Anala, Ainla
Punjabi – Aula, Amla
(5,6)

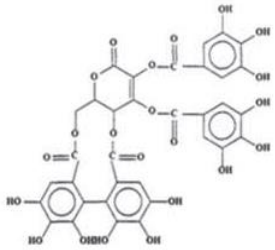
5.1. TAXONOMICAL CLASSIFICATION OF PHYLLANTHUS EMBLICA:

KINGDOM	**PLANTS**
SUBKINGDOM	Tracheobionta (vascular plants)
SUPERDIVISION	Spermatophyta (seed plant)
DIVISION	Angiospermae (flowering plant)
CLASS	Dicotyledonae (Dicotyledons)
SUBCLASS	Rosidae
ORDER	Geraniales
FAMILY	Euphorbiaceae
GENUS	Emblica
SPECIES	Officinalis Geartn**(7)**

6. CHEMICAL CONSTITUENT OF PHYLLANTHUS EMBLICA:

The most widely studied plant is phyllanthus emblica. It consists of tannins, alkaloids and also phenols. Phyllanthus emblica part contains about 28% of tannins. The fruit shows antioxidant property and also contains the chemical constituents called phyllemblin. It also has various phytochemicals that are Gallic acid, geraniin. The fruit juice has the highest concentration of vitamin c. It also has hydrolysable tannins like emblicanin A and emblicanin B. Phyllanthus emblica also have alkaloids like Phyllantine, phyllembein. It constitutes phenolic compound which are Gallic acid and ellagic acid. It also contains amino acid, carbohydrate, vitamin, organic acid, and various flavonoids. **(4)**

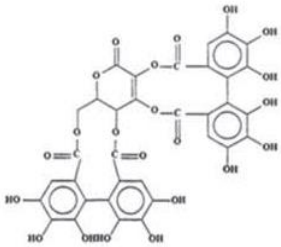
As comparison to the oranges tangerine and lemon phyllanthus emblica contain more amount of vitamin c tanins are the main constituent of amla that mainly found in fruit leaves and bark of the plant. **(6)**



Emblicanin-A

Chem. Formula:$C_{34}H_{22}O_{22}$

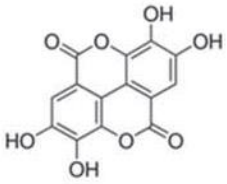
Molecular mass: 782



Emblicanin-B

Chem. Formula: $C_{34}H_{20}O_{22}$

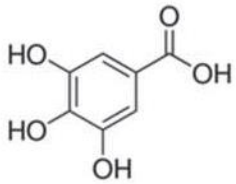
Molecular mass: 780



Ellagic acid

Chem. Formula: $C_{14}H_6O_8$

Molecular mass: 302



Gallic acid

Chem. Formula: $C_7H_6O_5$

Molecular mass: 170

MAJOR CHEMICAL CONSTITUENTS OF PHYLLANTHUS EMBLICA (6)

7. MEDICINAL ACTIVITIES OF PHYLLANTHUS EMBLICA:

7.1. Antioxidant

Amla contain vitamin c (Ascorbic acid) and polyphenol. The aqueous extract of amla which examine to inhibit the radiation which induces lipid peroxidation and superoxide dismutase that damages the rat liver microsomes and rat liver mitochondria. Ascorbic acid is more popular than phyllanthus emblica in the medical prospective. It shows that when the comparison to ascorbic acid it is powerful antioxidant is amla. **(9)**

It shows that phyllanthus emblica contains some amount of gallic acid, vitamin c and polyphenol where vitamin c used as powerful antioxidant agent that helps in boosting immunity. **(10)**

In other studies, it found that polyphenol content of water extract in phyllanthus emblica were found to be 34.22 plus minus 1.74gm gallic acid /100 gm extract. Phyllanthus emblica have high content of ascorbic acid 0.34%-0.38% and 0.40% w/w of the fruit which contain a shows 45-70 % of antioxidant activity **(11)**

7.2. Antidiabetic

This study on amla has been found that it did not shows any negative impact on blood glucose level in normal and in diabetic subject. The normal blood glucose range is found to be 70-110 mg /dl so, the result suggested that amla fruit has both antihyperglycemic and antilipid lowering property. **(12)**

The study on streptozotocin induce diabetes mellitus in a male rat and found that, the aqueous extract of phyllanthus emblica shows the antidiabetic effect on the stz induced D M rats. The diabetic rat is treated with the powder rhizome of the dried fruit of the emblica officinalis to show the antidiabetic property. **(13)**

7.3. Anti Tussive

Antitussive activity of phyllanthus emblica was been tested in cats by the mechanical stimulation of tracheobronchial mucous area of the airways. The dose of 50mg/kg shows that the phyllanthus emblica is act like a cough suppressive which shows the activity of cough suppressive which is dose dependent.

The extract of fruit of phyllanthus emblica contains a rich source of vitamin c that shows inhibitory the chronic cough with other antioxidant such as tocopherol and beta carotene. Phyllanthus emblica shows good ability to reduce mechanically stimulate cough but at the higher dose. **(26)**

7.4. Anti-Inflammatory

It is observe that phyllanthus emblica shows the anti-inflammatory activity as the carrageenan induces the rat paw edema that has been used for evaluation of the anti-inflammatory drugs. HAEEO (Hydro alcoholic extract of emblica officinalis) shows the good response against the carrageenan that induces the acute inflammation. After giving the HAEEO at a dose of 700 mg/kg it shows good significance as anti-inflammatory activity with 70% inhibition of the paw edema. **(14)**

The report suggests that phyllanthus emblica shows the inhibitory effect on the synthesis of the pain mediators i.e. responsible for main mechanism of action of phyllanthus emblica. **(15)**

The carrageenan that induce the paw edma models that used to in investigate the effect of the nsaids. It also shows potent anti-inflammatory activity in the treatment of inflammatory disorder and also potent to antiulcerogenic activity. **(14)**

7.5. Hepatoprotective

After the administered of carbon tetra chloride in the albino rat species which induces hepato toxicity. The fresh fruit of phyllanthus emblica dried in a room temperature and thus converted to the powder by percolation method by using 95% of ethanol. Result found that it has hepatoprotective in rats. **(17)**

Methanol extract of phyllanthus emblica shows the hepatoprotective activity. The leaf parts of phyllanthus emblica also confirms for the hepatoprotective activity. **(18)**

Methanolic in the vitro and in vivo condition, the model shows hepatoprotective activity. The aqueous extract of the plant phyllanthus amarus have been used as hepatoprotective against the various hepatotoxicity in the rats which was induced by the ethanol. **(19)**

7.6. Anticancer

Phyllanthus emblica extract are used in a marine model of murine model of skin carcinogenesis at the dose of 100mg /kg that reduces the tumor incidence by 60%. Phyllanthus emblica administered at the 60-250 mg/kg are been used for the prevention of hepatocellular carcinoma by 80-100% it is being proved that phyllanthus emblica shows the antitumor effect. **(20)**

The mixture ratio of 1:1 of the phyllanthine and hypophyllanthine which are isolated from the plant phyllanthus amarus that shows the potent antitumor activity at a dose of 25 mg/kg, 50 mg/kg and 100 mg/kg of the body weight against the EHRLICH-ASCITES carcinoma in the species of swiss albino mice. **(19)**

7.7. Antimicrobial

The decoction of phyllanthus emblica exhibited potent an antimicrobial activity against staphylococcus aureus, S. haemolyticus, S.saprophticus, Micrococuss varians, M. lylae, M. roseus, M. Sedentecius, M.halobius, Bacillus subtilis, B.Mega terium and candida albicans **(21)**

Phyllanthus emblica also consist of chemical compound that are mainly for antimicrobial activity that shows inhibition of microorganism growth. The four bacterial species namely Pseudomonas aueruginosa, Bacillus amiloliquifaciens, Staphylococcus aureus and Escherichia coli are inhibited by the sample of ethanolic plant extract of phyllanthus emblica and in comparision to standard antibiotic like tetracycline and chloramphenicol in which it shows that phyllanthus emblica indicates

maximum resistant for the pseudomonas aeruginosa and Escherichia coli. **(22)**

The comparative studies between plants like neem, amla, aloe, Assam tea and clove extract against the vibrio cholera, staphylococcus aureus and pseudomonas aeruginosa has done. Bioactive components of these plant species is separated out in the tlc plate which is found that the slower moving band from the amla extract was very potent and inhibiting the growth of various pathogens. **(23)**

7.8. Analgesic

Phyllanthus emblica has been traditionally used as an analgesic and for the treatment of inflammation. In the study that was conducted by Dong wook lin etal,.2016 of phyllanthus emblica prove that it shows analgesic effect in the plantae incision and spare nerve injury pain models in the rat. It is evaluated that mechanical withdrawl threshold and a pain related behavior was determined after when surgery perform. The regular treatment with phyllanthus emblica shows the analgesic effect. **(24)**

Phyllanthus emblica used for the evaluation of analgesic effect due to its anti-inflammatory action of extract that also shows analgesic effect. Prostaglandin biosynthesis influenced by the plant. The main mechanism action of phyllanthus emblica with water extract shows inhibitory effect in the synthesis of pain mediators. **(25)**

7.9. Antidiarrheal

Evaluation of antidiarrheal done with methanol extract of phyllanthus emblica on the rats where diarrohea is induced by castor oil and magnesium sulphate that shows significance reduction in the git motility. It also found that at the dose of 50, 100 and 150 mg/kg respectively shows antidiarrheal activity. **(27)**

7.10. Antibacterial

On the study of phyllanthus emblica and vitex negundo the extract used for the evaluation of antibacterial activity against different pathogenic bacterias such as escherichia coli, serratia-marceseens, pseudomonas aeruginosa and bacillus cereus. The aqueous extract and the methanolic extract of phyllanthus emblica prove to be show good inhibitory action against the test of all bacteria. **(28)**

The bacteria such as streptococcus mutants was evaluated against six Indian plant extract including phyllanthus emblica for the antibacterial property where the aqueous extract containing amla has been shows that it is effective against streptococcus mutants. The strains which was used are significant as an antibacterial activity. Ethanol was more effective than the water extract as the antibacterial compound lowers in water extract and more effective for the antibacterial activity. **(29)**

7.11. Anti-Ageing

Phyllanthus emblica used for antiaging property as it is helpful in reserving human AMD RPE cybrid cells from their damage. In vivo studies it found that for effect of antiaging the dose of phyllanthus emblica required in higher amount. In a process phyllanthus emblica was very effective in C2C12 myoblasts that as a skeletal muscle cell line. Study of rats 300 mg/kg of this phyallanthus emblica to SD rats was highly effective. Experiment was conducted with phyllanthus emblica extract that has been used at concentration of 25mg/ml in which DMSO was used as solvent than emblica officinalis dissolved in the culture media for the cell treatment. **(30)**

7.12. Neuroprotective

Phyllanthus emblica shows effective neurodegenerative disease in its treatment the study found that protective effect of phyllatnthus emblica extract was useful against the dna damage. Various extract of emblica officinalis methanol extract more effective and found to be stimulate the growth proliferation of the cells. Emblica officinalis also reduce oxidative stress that suppress the tumor cells and shows therapeutic potency for neurodegenerative diseases. **(31)**

7.13. Immunomodulatory

As the immune system are very important against infectious Diseases. Phyllanthus Emblica used as immunosuppressive effect for Chromium and Lyphocyte Proliferation. Amla extract contains various main biological constituents that helps in immune Stimulant and good for inhibiton of Tumor Growth. **(32)**

Phyllanthus emblica also protect against harmful free radical and also posess the activity as immunomodulator due to the effect of antioxidant property it shows immunomodulatory effect. **(33)**

8. CONCLUSION:

Phyllanthus emblica is most widely used as a drug in the Ayurveda. It is very useful to treat various diseases such as cough, analgesic problems and in cancer treatment. It also reduces the free radical production and also have the maximum number of antioxidant level. It is used for the ayurvedic preparation for example chywanprash where it is used as chief ingredient. About 85% of the people depend on this plant derived drug. Hence, are very beneficial to the health.

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