"REVIEW ON PHARMACOLOGICAL AND PHARMACOGNOSTIC ACTIVITIES OF *EMBILICA OFFICINALIS*"

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Abstract:

Emblica officinalis (Amla) is widely used in the Indian system of medicine and believed to increase defense against diseases. The Amla is known for its therapeutic properties and holds a reputed position in the ayurvedic and unani system of medicine in the country. Amla is a member of the small genus of Emblica (Euphorbiaceae). It grows in tropical and subtropical Parts of India, Sri lanka, China, Indonesia and the Malay Peninsula. Amla fruits, also known as Indian gooseberry. Emblica Officinalis is reported to possess Bioactive compounds like Tannins, Gallic Acid, Quarcetin, Ascorbic Acid, Ellagic Acid, Phyllembin, Emblicanin A&B which are confirmed to have different diverse Pharmacological Actvities.The fruits are useful in diabetes, bronchitis, hyperacidity, Peptic ulcer, dermatitis, haematogenesis, inflammations, Anemia, liver diseases, gastrointestinal tract disorder, Menorrhagia and cardiac disorders. Being exceptionally rich in Vitamin C, amla is vital for treatment of human scurvy. Emblica Officinalis plant is Used in the treatments of various ailments. The Diverse ailments like cancer, Atherosclerosis, Inflammation, Osteoporosis, Nuerological disorders, Hypertention and other infectious disorders.

Keywords: *Amla, Ayurvedic, Unani System, Pharmacological Actvities*.

Introduction :

Amla commonly known as Indian gooseberry, is a wonder herb and one of the precious gift Of nature to human health. It belongs to family *Euphorbiaceae*[1] PhyllanthusemblicaLinn., (*Euphorbiaceae*) Known as Indian gooseberry is a very highest source of vitamin C1found in Madhya Pradesh. It has Anti-viral,Anti-bacterial, Anti-proliferative, Anti-platelet, Anti-HIV & Hypolipidemic Properties[2] These fruits containing high levels vitamin-C, Tannins, polyphenols, fibers, minerals, proteins & amino acids[3]. *E. officinalis* extracts contain various antioxidants such As emblicanin A, emblicanin B, gallic acid, ascorbic acid, ellagic acid which are Effective in a range of ailments. Presence of various active phytocompounds Bestows Emblica officinalis fruit eaxtract with various therapeutic Benefits consequential of radioprotective[4] , antiatherosclerotic[5] , Antidiabetic[6] , antiaging[7] ,gastroprotective [8] cytoprotective and Immunomodulatory properties [9]

- **Botanical Description**:
- **Taxonomy**:
  - **Name in botany:** Phyllanthus Emblica (Linn.)
  - **Common name :** Indian gooseberry, Emblic,Myrobalan, Amla
  - **Family:** Euphorbiaceae.
  - **Similar names:** Emblica, Indian goose berry, amla.
  - **Kingdom:** Plantae-Plants
  - **Division:** Magnoliophyta- Flowering plant
  - **Superdivision:** Spermatophyta- Seed plant

- **Order:** Euphorbiales
- **Genus:** Phyllanthus-Leafflower
- **Species:** Emblica officinalis
- **Subclass:** Rosidae
- **Subkingdom:** Tracheobionta

- **Vernacular names:**
  - **Sanskrit:** Adiphala, Dhatri, Amalaka
  - **Urdu:** Anwala
  - **Assamese :** Amlaki
  - **Hindi:** Amla, Amlika, Aonla
  - **Punjabi:** Ambli
  - **Marathi:** Aola
  - **Tamil:** Nelli
  - **Gujarathi:** Amali, Ambala
  - **Telugu:** Amalakamu, Usirikai
  - **Bengali:** Amla, Amlaki
  - **Kannada:** Amalaka, Nelli
  - **Malayalam:** Nelli

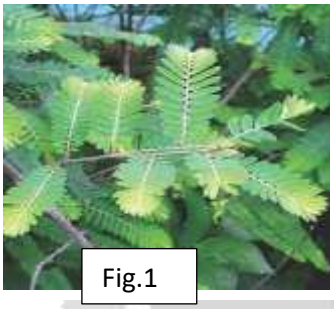

Fig.1

Fig.2

Fig.3

It is deciduous medium-sized tree with branches.

- **Leaves-** leaves are simple, 10-13 mm long, stipulate, Linear, feathery, 2-3 mm broad, with very small Narrowly oblong, pinnately arranged leaflets. Flowers – very small, unisexual, 0.5 to 1.5 cm across, Greenish-yellow.
- **Fruits –** fruits are nearly globular or spherical slightly Broader than long, and with a shallow, small, conical Depression at longitudinal axis, mainly at that point Where stalk attached, in different sizes. They are Marked with six lobes, pale green or yellowish color, 1.5-2.5 cm in diameter. Matured fruits have Yellowish-brown endocarp and also yellow mesocarp. The mesocarp in it is acidulous and astringent in Dried fruits and acidulous in fresh fruit.
- **Seeds-** Trigonous, two each in three crustaceous Cocci

Macroscopic Characters [10-11]:

- **Color-** Green. But when matures, it becomes light yellow or brick red.
- **Odor-** Almost none
- **Taste-** Astringent and Sore
- **Size-** Diameter is 1.5-2.5 cm.

Chemical Constituents :

Class	**Compound**
Alkaloid	Phyllantine, phyllantenin, zeatin, zeatin nucleotide

Diterpenes	Gibberellin A-1, A-3,A-4,A-9
Triterpenes	Lupeo
Flavonoids	Leucodelphinidil, kaempherol, rutin Quercetin
Furanolactone	Ascorbic acid
Sterol	Beta –setosterol
Carbohydrates	Glucose

Pharmacological activities :

1. Anti-Oxidant and Anti-Tumor Activity[12] [13]:

The present study was designed to investigate the antioxidant and anti-tumor activity of *Phyllanthus Emblica*. Antioxidant potential of the edible plant was evaluated in-vitro by DPPH (1, 1 diphenyl,2picrylhydrazyl) scavenging assay and FRAP assay method. The % decrease of DPPH standard solution was recorded 71.5% for *Phyllanthus Emblica*. The cytotoxic effect was determined against the cancer cell lines HT-29 using the MTT assay.In conclusion *Phyllanthus Emblica* possess more potential cytotoxic activity against HT29 cell lines.

2.Anti-Microbial and Anti-Oxidant Activity [14], [15] :

The present study was carried out to evaluate the in-vitro antimicrobial and anti-oxidant activity of *Emblica Officinalis* juice powder. The antimicrobial activity was assessed against gram positive and gram negative bacteria by agar well diffusion method. The antioxidant activity of powder was determined in vitro using hydrogen peroxide scavenging activity method. The amount of total phenolic content was also determined by FolinCiocalteaumethod. The result of the study revealed antibacterial and antioxidant activity.

3.Immunostimulatory Activity [16] :

Investigate the immunological efficacy of the anti-aging effects of P. emblica infusion in a BALB/c mice model.And to verify the safety for the consumption of P. emblica infusion in BALB/c mice. For in-vitro studies,splenocytes were isolated from mice and examined in comparison with the human umbilical endothelial cells, fibroblasts and YAC-1 (mouse lymphoma) cells for proliferative activity upon the exposure to P.Emblica infusion. For in-vivo studies, mice were orally administered with P.Emblica infusion at a dose range of 0,50,100,200 mg/kg B/W for 14 days. After the treatments, splenocytes isolated from these mice examined for proliferative and NK cell activities.

4. Anti-Hyperlipidemia,Hypolipidemic and AntiAtherogenicActiviy [17] :

The present study was aimed to evaluate hypolipidemic and Anti-Atherogenic activity of fruit of *Emblica Officinalis* in high fat albino rats. For study of Anti-Hyperlipidemic, hypolipidemic, antiatherogenic activity. 5 groups of 6 animals in each received normal saline, *E.Officinalis* powder, high fat diet, High fat diet plus *E.officinalis* powder both and Atorvastatin respectively for 8 weeks. At the end of the study blood samples of the animals were sent for the estimation of the lipid profile and effects of test drug studied by comparing levels of Total cholesterol, Triglycerides, HDL, LDL, and atherogenic index.

5.Radical scavenging activities[18]:

The compounds isolated from Emblica fruit namely hydroxymethylfurfural, quercetin, gallic acid, ellagic acid, cinnamic acid, using mass spectrometry and NMR spectroscopy were found to possess 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activities except for cinnamic acid.

6. Hepatoprotective activity [19] :

Emblica officinalis (EO) and chyavanaprash (CHY) extracts was studied using Carbon tetrachloride induced liver injury model in rats. EO and CHY extracts were found to inhibit the hepatotoxicity produced by acute and chronic administration as seen from the decreased levels of serum and liver lipid peroxides (LPO), glutamate-pyruvate transaminase (GPT) and alkaline phosphatase (ALP). Chronic CCI (4) administration was also found to produce liver fibrosis as seen from the increased levels of collagen hydroxyl proline and pathological analysis. EO and CHY extracts were found to reduce the elevated levels significantly, indicating that the extract could inhibit the induction of fibrosis in rats.

7.Diabetics[20] :

Oral administration of the extracts (100 mg/kg body weight) reduced the blood sugar level in normal and in alloxan (120 mg/kg) diabetic rats significantly within 4 hours.EO cataract in rats. Aldose reductase (AR) has its involvement in the development of secondary Exploring the therapeutic value of natural ingredients that people can incorporate into everyday life may be an effective approach in the management of diabetic complications.

8.Immunomodulation[21]:

Immunomodulatory effect of aqueous extracts of Amla was examined by Suja et al. (2009) on Swiss Albino mice. Administration of extracted Amla powder increased the haemagglutination antibody titre, sheep red blood cells (sRBCs) in dose dependent manner and also induced the delayed type of hypersensitivity reaction, macrophage migration index, and respiratory burst activity of the peritoneal macrophages, total leukocyte count, percentage lymphocyte distribution, serum globulin and relative lymphoid organ weight.

9.Anlagesic Effect [22]:

The present study investigated whether *E.Officinalis* extracts exhibit analgesic effect in the plantar incision (PI) and spared nerve injury (SNI) pain-model rats. There evaluated the mechanical withdrawl threshold (MWT) using von Frey filaments, and pain-related behavior was determined after surgery based on ultrasonic vocalization. The group treated with *E.Officinalis* extracts at 300 mg/kg had significantly increased MWT values at 6h and 24 h after the PI, and had a significantly reduced number 22-27 kHZ USVs at 6 h and 24 h after PI. Moreover, after 15 days of continous treatment with *E.Officinalis* extracts, the treated group showed significantly alleviated SNI-induced hypersensitivity and reduced pro-inflammatory cytokine levels.

10 Anti-UlcerogenicActivity[23]:

Emblica Officinalis significantly reduce the symptoms such as blenching, fullness, heart burn, nausea and vomiting in ulcer and dyspepsia patients. The dry powder and the aqueous extract show pro-kinetic effect. The dry powder used in lower dose show pro-kinetic effects where as in the peak acids out-put of the patients.

Conclusion:

In this review,the pharmacognostic and pharmacologic studies conduct on *Embilica Officinalis.* The significance *of Embilica Officinalis* and it's extract as source of medicine.Dates back to centuries and hence it is mentioned in age old art of medicine the" Ayurveda". *Embilica Officinalisis* one of the richest natural sources of vitamin C , its fresh juice containing nearly twenty times as much vitamin C as orange juice. The plant extract used in prevent study exhibit the presence of various active component such as phenols, flavonoids, along with their antioxidant and antimicrobial activities which may be useful against different infection or diseases. It can be safely used in the treatment of mild to moderate cases of hyperlipidaemia ,heart disease , cancer disease etc and it is easy available, no cost effective, and other beneficial effects.

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