

An Phyto - Chemical Analysis of Seedless Amalaki Fruit (*Emblica Officinalis*) Churna

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Abstract: Medicinal plants have bioactive compounds which are used for curing of various human diseases and also play an important role in healing. As Amalaki being an important medicinal herb in Ayurveda. Botanical name of Amalaki is *Emblica officinalis* belong to Euphorbiaceae family shows antifungal, antibacterial and anti-inflammation, anti cholesterolaemic, anti carcinogenic, anti oxidant & anti Ulcerogenic activities. The present study involve phytochemical analysis on the pulp of *Emblica officinalis* purchased from Gadagil vanoushada sangraha, Belgaum, Karnataka. *Emblica officinalis* fruits are selected and seeds are removed. Collected pulp is made to dried under shadow and powdered. The Aqueous extract, alcoholic extract of Amalaki samples were used for the phytochemical analysis to find out the phytochemical constituents. The main objective of the research work was to check the presence or absence of the phytochemical constituents in Amalaki churna. The results of the phytochemical analysis of Amalaki churna showed that the carbohydrates/glycoside, phenol, carboxylic acid, tannin, flavonoids were found to be present. The phytochemical analysis of the Amalaki is very important commercially and has great interest in pharmaceutical companies for the production of the new drugs to cure various diseases.

Keywords: phytochemical, Amalaki, churna.

I. INTRODUCTION

Amalaki is one of the most commonly used and important herb in Ayurvedic medicine. It is described extensively by Brhat Trayi texts as well as Nighantus. Botanical name of Amalaki is *Emblica officinalis* belonging to Euphorbiaceae family useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents.[1] Phytochemicals are naturally occurring in the medicinal plants, leaves, vegetables and roots that have defense mechanism and protect from various diseases. Phytochemicals are primary and secondary compounds. Chlorophyll, proteins and common sugars are included in primary constituents and secondary compounds have terpenoid, alkaloids and phenolic compounds.[2] Charakacharya has considered Amalaki under vayastapana and virechanopaga gana. Where as sushruthacharya considered in triphala and parushakadi gana. The synonyms are Jathiphala, Seedhuphala, Vayastha, Amrutha phala, Dhatri, Vrushya phala, Dhatri phala, Sriphala, Amrutha phala, Amalaka, Shiva etc.[3] Amalaki bark, leaves and fruits are commonly used for medicinal purpose. The fruits are sour, astringent, bitter, acrid, sweet, cooling, ophthalmic, carminative, laxative and aphrodiastic. They are used in vitiated conditions of tridosha, diabetes, cough, asthma, bronchitis, hyperacidity, peptic ulcer, skin diseases, cardiac disorders, intermittent fever, graying of hairs.[4] The main objective of the research work was to analyze the presence or absence of different phytochemicals present in Amalaki churna purchased from gadagil vanoushada sangraha, belgaum and the phytochemical study was held at SDM center for research in Ayurveda and Allied sciences, udupi, Karnataka used for healing and curing of various diseases.

II. Materials and methods

Sample collection: The present study involve phytochemical analysis on the pulp of *Emblica officinalis* purchased from Gadagil vanoushada sangraha, Belgaum, Karnataka. *Emblica officinalis* fruits are selected and seeds are removed. Collected pulp is made to dried under shadow and powdered

Preliminary phytochemical tests : These tests are used to detect the presence of various organic functional groups, which is the indicative of type of phytochemicals present in the plant. These tests indicate the presence different class of constituents present in the extract. The following tests have been carried out for both alcohol and aqueous extracts. [5]

Tests for alkaloids: Dragendroff's test: To a 50 mg of sample extract dissolved in alcohol, a 3 drops of acetic acid and Dragendroff's reagent were added and shaken well. An orange red precipitate formed indicates the presence of alkaloids.

Tests for carbohydrates: Molisch's test: To the extract, 1 ml of α -naphthol solution and conc. sulphuric acid were added along the sides of test tube. Violet colour formed at the junction of the two liquids indicates the presence of carbohydrates.

Test for steroids: Libermann-Burchard test: To the extract was dissolved in chloroform, 1 ml of acetic acid and 1 ml of acetic anhydride were added, then heated on a water bath and cooled. 1 or 2 drops of conc. Sulphuric acid was added along the sides of the test tube. Appearance of bluish green colour indicates the presence of steroids.

Test for saponins: To a 10 mg of extract, distilled water was added and shaken. Stable froth formation indicates the presence of saponins.

Test for tannins: To the extract, a 2 drops of dilute solution of ferric chloride was added, formation of dark blue colour shows the presence of tannins.

Test for flavonoids : Shinoda's test: To the extract in alcohol, a 1 mg magnesium turnings and 2 drops of conc. hydrochloric acid were added and heated on a water bath. Formation of red to pink colour indicates the presence of flavonoids.

Test for phenol: To the extract in alcohol, added two drops of alcoholic ferric chloride. Formation of blue to blue black indicates the presence of phenol.

Test for coumarins: To the extract in alcohol, a 2-3 drops of 2 N sodium hydroxide solution was added. Dark yellow colour formation indicates the presence of coumarins.

Test for triterpenoids: The extract was warmed with tin bits and 2 drops of thionyl chloride. Formation of pink colour indicates the presence of triterpenoids.

Test for carboxylic acid: Extract dissolved in water is treated with sodium bicarbonate. Brisk effervescence indicates the presence of carboxylic acid.

Tests for Resins : Extract treated with acetone and distilled water. Turbidity indicates the presence of resins.

Tests for amino acids: Extract dissolved in alcohol treated with 3 drops of ninhydrin solution. Violet colour indicates the presence of amino acids.

III. Results

This study has revealed the presence of phytochemicals considered as active chemical constituents. In aqueous extract of Amalaki the available phytochemicals are flavanoid, carbohydrate/glycoside, phenol, carboxylic acid, tannin, terpenoid, resin, saponins. In alcoholic extract phytochemicals like carbohydrates, alkaloid, coumarin, steroids, phenol, carboxylic acid, tannin, amino acid were present in the sample. *Emblca officinalis* shows anticholesterolaemic, immunomodulatory, anticarcinogenic, antioxidant, antiulcerogenic and antimicrobial activity.

Table I: showing presence of phytochemicals in Amalaki

Test	Alcoholic extract	Aqueous extract
Alkaloid	+	-
Coumarin	+	-
Flavanoid	-	+
Carbohydrate/glycoside	+	+
Steroid	+	-
Phenol	+	+
Carboxylic acid	+	+
Tannin	+	+
Terpenoid	-	+
Resins	-	+
Saponins	-	+
Aminoacids	+	-

+ = presence of phytochemicals

- = absence of phytochemicals

IV. Discussion

A Study showed that Phenolic compounds (tannic acid etc) are having strong antioxidant action. It is also evident that phenolic compounds obtained from natural source may reduce oxidative stress by free-radical scavenging activity. Hence, the results of the present work suggest that the FPEO and BPEO fractions from the fruit of *E. officinalis* can attenuate the acute and chronic inflammatory response via antioxidant action.[6] A study Concluded that the Amla possesses antineoplastic, chemomodulatory, chemopreventive and radioprotective effects. Several mechanism are likely to responsible for the observed effect. The most imported being the induction of apoptosis of neoplastic and preneoplastic cells, free radical scavenging, antimutagenic, Anti oxidants and anti inflammatory activities.[7]

Anti cholesterolaemic activity: *Emblica officinalis* is known to reduce the cholesterol levels in normal as well as hyper cholesterolaemic individuals. Hepatic cholesterol, Aortic cholesterol is significantly reduced with *Emblica officinalis*. It has no influence on euglobulin clot lysis time and platelets adhesiveness and serum triglyceride level.[8]

Immunomodulatory effects: *Emblica officinalis* is significantly beneficial in stimulating immune system. It enhances natural killer cell activity and anti body dependent cellular toxicity. There are several reports regarding the immune stimulatory effects of ascorbic acid. As *Emblica officinalis* is considered the richest source of vitamin C, it is thought that the immunomodulatory effects of *Emblica officinalis* is mediated by the ascorbic acid present in it.[8]

Anti carcinogenic activity: Diet supplementation with extract of *Emblica officinalis* is known to reduce the cytotoxic effect. It also possesses an anti metastatic activity against melanoma cells. Water, acetone, chloroform extract are known to inhibit mutagenesis. The anti carcinogenic activity of *Emblica officinalis* is mediated by its Anti oxidant property.[8]

Anti oxidant activity: *Emblica officinalis* is indicated in several stress induced disorders and it significantly exhibit adaptogenic, anti stress, immune potentiating and memory facilitating effects. It is postulated that several of this stress induced diseases including process of ageing may be related to the accumulation of oxidative free radicals called as reactive oxygen species (ROS). In different tissues *Emblica officinalis* tannoids have recently been reported to enhance ROS scavenging activity in rat brain frontal cortex and stratum, enhancing the concentration of the anti oxidant enzymes super oxide dismutase(SOD), catalayase (CAT) and glutathione peroxidase (GPX) resulting in reducing lipid peroxidation. The super oxide anion (O_2^-)- H_2O_2 and hydroxyl radical (OH) are the major ROS which induce cell degeneration by increasing lipid peroxidation of cell membrane lipids. The toxic product of lipid peroxidation induces damage of structural and functional integrity of cell membrane, breaks DNA strands and denatures cellular proteins. The natural cellular anti oxidant enzymes include SOD, which scavenges super oxide radicals by speeding up their dismutation. CAT a haeme enzyme that removes H_2O_2 and GPX which scavenges H_2O_2 and other perioxides. Detoxification of the super oxide anion is not a terminating step in free radical scavenging, since the enzyme catalayase dismutation results in the production of H_2O_2 , which acculmulates in the mitochondria and cytosol. Unless the peroxide is scavenged by CAT and GPX, in the presence of iron, may lead to production of OH. These ROS together with slight molecular oxygen, may attack lipid proteins and DNA of cells following increased lipid per oxidation chain reaction resulting in wide spread cellular injury. It is possible that in chronic stress, thus increased level of SOD leads to increased generation of per oxides, which due to reduced CAT and GPX levels are not effectively scavenged resulting in augmented lipid per oxidation.[8]

Anti Ulcerogenic property: *Emblica officinalis* significantly reduce the clinical symptoms such as belching, fullness, heart burn, nausea and vomiting in ulcer and dyspepsia patients. The dry powder and the Aqueous extract show pro-kinetic effect. The powder used in lower dose show pro-kinetic effects where as in the peak acid out-put of the patient.[8]

Anti microbial activity: *Emblica officinalis* has been reported to pronounced anti viral properties. It is administered against acute viral hepatitis and other disorders. Aqueous extract of *Emblica officinalis* shows potent anti fungal activity against pathogenic yeast, candida albicans. It is believed that biological and therapeutic effects of amla fruits are due to the presence of vitamin C content of fruit. Some recent studies have indicated that there is a complete absence of L-ascorbic acid in the fresh juice and solvent extractives of fruits. The investigation further indicates that the potent vitamins C like activity of the fruit is due to the presence of low molecular weight hydrolysable tannins. These are Emblicannin A-27%, Emblicannin B-23%, Penigloconin 8%, Pedunculagin 14%, gallo ellagitannoids 10-30%, rutin 10%. Pedunculagin are isolated from fresh pericarp their chemical structure is established. Emblicannin A and B is found to exhibits significant anti oxidant activity in vitro. The anti oxidant activity of tannoid found to be three times more potent as compared to vitamin C.[8]

V. Conclusion

Phytochemicals present in Amalaki (*emblica officinalis*) powder are phenol, tannin, flavonoid, carboxylic acid, carbohydrate acts as antimicrobial, antiulcerous, immunomodulator, anticarcinogenic etc hence it is useful in curing the diseases like diabetes, cough, asthma, bronchitis, hyperacidity, peptic ulcer, skin diseases, cardiac disorders, intermittent fever, graying of hairs.

References

- [1]. Acharya Priyavrat Sharma, *Dravya guna- Vignana. Part 2*, Varanasi: Chaukhambha Bharati academi; 14th ed, 1993, p. 758.
- [2]. Wadood et al., *biochemistry & analytical biochemistry* 2013, 2:4 <http://dx.doi.org/10.4172/2161-1009.1000144>
- [3]. Praiya vrat Sharma, Guruprasad Sharma, *Kaiyyadeve nighantu (Pathya apathyavibodaka)*. Varanasi; Chaukhambha orientalia; 1st ed, 1979, Verse 235-7, P.47.
- [4]. vd. Mukund sabnis. *Chemistry and pharmacology of Ayurvedic Medicinal plants*. Vol 2; Varanasi, Amarabharati prakashana; 1st ed, 2006, p. 188-89.
- [5]. Harborne JB, 1973 (*Phytochemical Methods*. Jackman H. (Ed.), London, p. 70).

- [6]. Arunachalam Muthuraman, Shailja Sood, Sumeet Kumar Singla. The antiinflammatory potential of phenolic compounds from *Emblica officinalis* L. in rat. *Inflammopharmacol* 2011;19:327. DOI 10.1007/s10787-010-0041-9.
- [7]. Manjeshwar shrinath baliga and Jason Jerome D souza. Amla(*Emblica officinalis* Gaert), wonder berry in the treatment and prevention of Cancer. *European Journal of cancer prevention* 2011 vol 20 225-239.
- [8]. vd. Mukund sabnis. *Chemistry and pharmacology of Ayurvedic Medicinal plants*. Vol 2; Varanasi, Amarabharati prakashana; 1st ed, 2006, p. 190-93.