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Triphala Powder: A Wonder of Ayurveda

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***Abstract*— Triphala is one of the most important formulation that is used worldwide as a remedy for constipation. Beside laxative properties it also have large number of other benefits that includes anticancer and antiageing properties. Each constituents of Triphala have medicinal values against various ailments. So combination of these three ingredients make Triphala a wonder drug and often regarded as elixir of life.**

***Keywords*— Triphala, Ayurveda, Emblica officinalis, Terminalia belerica, Terminalia chebula.**

I. Introduction

Trifla churn is a widely used herbal formulation of Ayurvedic system of medicine, easily available in the global market as a dietary supplement. It is a powdered mixture of dried fruits of three important myrobalans i.e. Emblica officinalis Gaertn., (Amalika) Terminallia belerica Roxb. (Bibhitaki) and Terminalia chebula Retz.(Haratki) in equal proportion [1]. This formulation is considered as an important rasayana in Ayurvedic system of medicine. The recipe for this Ayurvedic formulation is described in the ancient books on Ayurveda, the Charak Samhita and Susruta Samhita which date back to 1500 B.C. [2]. Trifla is considered as a 'tridoshic rasayan' having balancing and rejuvenating effects on the three constitutional elements that govern human life: vata which regulates the nervous system, pitta which maintains metabolic processes, and kapha which supports structural integrity [2]. A popular folk saying in India is, "No mother? Do not worry so long as you have Trifla." This indicates that Trifla can care for the internal organs of the body as a mother cares for her children. Trifla is mild, non-habit forming, safest and most strengthening laxative and purgative formulation hence recommended for all. It is also used as rejuvenating agent and widely recommended by herbal practitioners for various ailments of the human body and often called elixir of life.

II. Brief Description Of Ingredients

(a). Embelica officinalis Gaertn. (Syn. Phyllanthus emblica Lin.):

Dried fruit powder of Embelica officinalis is an important constituent of Trifla churn. It is known by the name of Amalika in Sanskrit, Amla in Hindi and Indian gooseberry in English. It belongs to family Euphorbiaceae. Embelica officinalis is also known in Sanskrit as Dhatri (The nurse), which is a reference to its incredible healing properties. It is a medium size tree normally reaching a height of 18 meters or in some cases up to 30 m, found in mixed deciduous forests, ascending to 1300 meters on hills and cultivated in gardens and home yards. Fruits are nearly spherical, light greenish yellow, quite smooth and hard on appearance, with 6 to 8 pale lines giving it the appearance of being divided into segments or lobes and are light green at first, later on becomes greenish-yellow or more rarely brick red as it matures [1]. The taste of Indian gooseberry is sour, bitter and astringent, and it is somewhat fibrous [1]. It is highly rich in vitamin-C and tannin [3-5]. In Ayurveda, Emblica officinalis is supposed to possess the property of balancing the three doshas (body disorders) and is considered good for all tissue elements [6]. According to Ayurveda, Emblica officinalis works on all tissues and Circulatory, digestive and excretory systems. It is valuable in reducing pitta due to its cooling property and balances vata by virtue of its sweet taste and the kapha primarily due to its drying action [1,2]. It may be used as a rejuvenative to promote longevity, and to enhance digestion, treat constipation, reduce fever and cough, purify the blood, ease asthma, strengthen the heart, benefit the eyes, stimulate hair growth, and enhance intellect [3,6,7]. Amalaki is also used in blood sugar regulation, as hepatoprotective, antitumor agent, good antioxidant, in anemia and jaundice etc. [4]. Along with Trifla, this fruit is also a major constituent of Chyawanprash; an important rejuvenating Ayurvedic formulation [1].

(b). Terminalia belerica (Gaertn.) Roxb.

T. belerica, an important medicinal plant of the family Combretaceae, is known by the various names in India. In Sanskrit it is known by the name of Bibhitaki: means which keeps diseases away, Baheda in Hindi, Marathi and Beleric Myrobalan in English (The Ayurvedic Pharmacopea of India). It grows wildly throughout the Indian subcontinent, Sri Lanka, and South East Asia, up to 1200 meters elevation, in a wide variety of ecologies [8]. It is a large deciduous tree attaining a height in between 20 to 30 meters with a buttressed trunk, a thick brownish grey bark with shallow longitudinal fissures, leaves are crowded around the ends of the branches, fruits are ovoid grey drupes, obscurely 5- angled, narrowed into a very short stalk [9,10]. In Ayurveda fruits and its kernel were portrayed to possess medicinal value. Fruits of T. belerica contain tannins, ellagic acid, ethyl gallate, chebulaginic acid, bellericanin, gallo-tannic acid, gallic acid and lignans resins [1, 8, 11]. In Ayurveda the fruits are regarded as an excellent expectorant and strong laxative, rejuvenative and good against kapha related disorders[1, 12]It is anthelmintic, aperients, sweet, anodyne, styptic, and antipyretic, antiemetic in nature whereas seeds are rich in oil and have narcotic properties [8]. It is also good in chronic diarrhea, dysentery, and increases appetite and also effective in colds and cough and good when taken with honey in sore throats [13].

(c) . Terminalia chebula Retz.

T. chebula, an important medicinal plant of Ayurvedic system of medicine belongs to family Combretaceae. It is tall

deciduous tree and can reach up to 20 meters in height with stem girth up to 1meter [14]. It is a native of Southern Asia from India and Nepal east to Southwestern China and Sri Lanka, Malaysia and Vietnam [15, 16]. In India it is found in deciduous forests of Himachal Pradesh, Tamil Nadu, Kerala, Karnataka, Uttar Pradesh, Andhra Pradesh and West Bengal [14]. T. chebula is popularly known by the name of Haratki in Sanskrit, Harda in Hindi and Chebulic Myrobalan in English. The leaves are alternate to subopposite in arrangement, oval, 7 - 18 cm long and 4.5 - 10 cm broad with a 1 - 3 cm petiole. The fruits are drupe-like, 2 - 4.5 cm long and 1.2 - 2.5 cm broad, blackish, with five longitudinal ridges [17]. T. chebula is a popular traditional medicine; it is not only used in India but also in other countries of Asia and Africa. It is a top listed plant in Ayurveda and extensively used in Unani, Siddha and Homeopathic medicine [14]. T. chebula was found to possess several medicinally important constituents like: tannins, flavonoids, anthraquinones, gallic acid, chebulinic and chebulagic acid, ellagic and ethaedioic acid, terpinenes and terpinenols, resin, and fixed oils [1,18,19]. The Charaka-Samhita describes Haritaki as having all the taste except saline. It further states that Haritaki will eliminate the doshas, stimulate digestion and promote longevity [20].. The powder of the dried fruits of T. chebula is used for the various therapeutic purposes. Because of its immense therapeutic potential it is used for the treatment of constipation, diarrhea, ulcers, gastroenteritis, asthma, cough, dyspepsia, hemorrhoids, candidiasis, malabsorption syndrome, hepatomegaly, vesicular and renal calculi, urinary discharges, tumors, skin diseases, leprosy, intermittent fever, rheumatism, arthritis, gout, neuropathy, paralysis, memory loss, epilepsy, depression, diabetes, cardiovascular diseases and anorexia [14, 21]. Due to these medicinal properties, T. chebula is proudly called as the "King of Medicine" in Tibet [22]

III. Phytochemistry Of The Formulation

Trifla encompasses the medicinal properties of all the three ingredients. Phenolic acids and tannins are the most commonly found polyphenolic compounds. The major chemical compounds reported from this formulation are phenolics (25-38%), comprising mainly of tannin (35%), gallic acid (3%-7%), elagic acid (~2 %), chebulagic acid (~ 5%) and chebulinic acid (~5%) along with good amount of ascorbic acid (0.050-0.33%) flavonoids and saponin [23-25]. Presence of good amount of phenolics and ascorbic acid are believed to be major chemical components of Trifla churn having therapeutic potential against age related disorders.

IV. Validated Therapeutic Potentials

(a). Antibacterial activity

Triphala is a rich source of polyphenolic compounds [23,25] that empower it with broad spectrum antimicrobial potential. Triphala and its ingredients has been reported highly effective against various pathogenic and non pathogenic bacterial strains [26-28]. Triphala was also found effective against the Enterococcoi that are involved in nosocomial bacteremia, surgical wound, and urinary tract infections [29]. Triphala have shown broad spectrum antimicrobial activity against some resistant bacterial isolates and bacterial isolates isolated from the human secretions [30]. Enteric bacterial pathogens are also reported highly sensitive towards the extracts of Triphala and its ingredients [31,32]. Ingredients are also reported effective against the growth of Salmonella typhi, isolated from different human pathogens [33]. Aqueous and ethanolic extract of Triphala and its ingredients have shown promising effects against the growth of bacterial strains isolated from the HIV infected patients [34, 35]. Use of Triphala as mouthwash effectively reduced the number of mutant streptococci in saliva [36 -38]. The bacterial isolates isolated from the wounds of workers also showed sensitivity towards the extracts of Triphala when tested in vitro [39].

(b). Antiviral activity

Triphala and its contents are reported to possess antiviral activity. Ingredients of Triphala showed significant inhibitory activity at lowest IC50 values against human immunodeficiency virus-1 reverse transcriptase [40, 41].

(c). Antifungal activity

Antifungal compounds plays significant role in the treatment of fungal disease. Triphala is reported to have antifungal potential against the dermatophytic fungal species and effectively controlled the growth of these pathogenic fungi [42, 43]. An aqueous extract of Triphala is also found effective in the management of species of Aspergillus [44, 45]. Terminalia belerica, one of the ingredients of Triphala also reported to possess antifungal compounds [41]. Additionally, Triphala is reported to have good antifungal activity against Candida albicans; one of the most notorious dermatophytic pathogen [38].

(d). Anticancer activity

Triphala is a rich source of gallic and chebulic acid which are reported to possess anticancer properties [46, 47]. The ctotoxic effect of aqueous extract of Triphala on human breast cancer cell line differing in their p53 status is well studied [48,49]. The author reported high rate of apoptosis in tumer tissues of Triphala fed mice as compared to control and also found that Triphala spared the normal cell line. Triphala also showed promising results on (AR)+ LNCaP prostate cancer [46] Additionaly, acetone extract of Triphala also proved effective as cytotoxic agent against cancer cell lines, shionogi 115 (S115) and MCF-7 breast cancer cells and PC-3 and DU-145 prostate cancer cells [50]. In vitro and in vivo studies on effect of Triphala on pancreatic tumor cells proved the role of Triphala in apoptosis as it inducesed apoptosis in pancreatic cancer cell line BxPC-3 and suppressed the growth of Capan-2 pancreatic tumor-xenograft while it spared the normal human pancreatic ductal epithelial (HPDE-6) cells [51]. In comparision to control, mouse fed with Triphala showed the reduced liver damage induced by carcinogenic compound, 1,2 –Dimethyl Hydrazine Dihydrochloride [52]. Similarly, Triphala fed mice effectively coped with benzo (a) pyrene (B(a)P) induced forestomach papilloma. Triphala also showed better effect in comparision to the individual constituents [53].

Wongnoppavich et al. [54] extensively reviewed the anticancer potential of Triphala and its ingredients.

(e). Some other Uses

Trifla is a secret formula for the maintenance of a healthy digestive system, which is a key to overall health. The power behind Trifla's benefits comes from the ingredients that make up the formula. According to Ayurveda, Trifla churn is a safe and non habit forming formulation, hence can be recommended for all age groups [23]. Trifla works by stimulating the mucosa of the gastric-intestinal tract, improving and balancing digestion. It corrects constipation, cleanses and tonifies the gastrointestinal tract, detoxifies the whole body and improves digestion and assimilation [55]. Trifla further aids in digestion by eliminating toxins from the intestinal tract. Trifla is also found effective in weight loss, for those who suffer from obesity, it works well as a colon cleanser [2, 56]. Being a rasayana, it arrest aging, enhances intelligence, memory, strength, youth, luster, sweetness of voice and vigor [2]. It is also supposed to nourish blood, lymph, flesh, adipose tissue and semen and thus prevent degenerative changes and illness. It improves the overall metabolic process and builds natural resistance against infection [57]. According to Ayurvedic practitioners, daily use of Trifla promotes appetite, ensures good digestion, increases red blood cells and hemoglobin and helps in removal of undesirable fat, strengthens the different tissues of the body, prevents ageing, and promotes health and immunity, build up the nervous system, muscles and blood, act as a Cardio - tonic, control blood pressure, improve blood circulation and reduce cholesterol levels, strengthen vision. It is also employed in headache, dyspepsia, liver conditions, leucorrhoea and used as an anti-inflammatory, analgesic, anti-arthritic, hypoglycemic, radioprotective and anti-aging agent [2, 23, 24, 58]. In addition, daily use of Trifla promotes the absorption of nutrients, like B vitamins and creates a favorable chemical environment for the proliferation of beneficial intestinal bacteria and an unfavorable environment for non-beneficial intestinal bacteria [2]. Its purgative action is believed due to the presence of chebulagic acid and its antioxidant, immunomodulatory, anti-inflammatory, analgesic and anti-ageing action is due to the presence of phenolicglycoside compounds and tannin [2]. So in this way Trifla may rightly be called, a panacea for all ailments.

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