

Review Article

Triphala- Contemporary Aid in Dentistry

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ABSTRACT:

Triphala (/tri:fa:la/ त्रिफला) is an Ayurvedic herbal rasayana formula consists of equal part of three myrobalanas, which are taken together without seed: Amla (*Emblica officinalis*), Bihara (*Terminalia bellirica*), and Harada (*Terminalia chebula*), Triphala being a traditional ayurvedic medicine treats a range of medical as well as dental ailments, it is mainly used in treating immune system stimulation, digestion improvement, constipation relief, gas relief, diabetes treatment, eye diseases, cleansing of G.I tract. As the allopathic medicine provide effective antibiotic therapy for bacterial infection & regular use of antibiotics cause resistance to it, so herbal medicines are preferred over antibiotics. Triphala is being extensively used for its various therapeutic properties in dentistry including its anti-cariogenicity action, used as antioxidant, anti-collagenase, and anti-microbial action. Triphala can also be used in managing various gingival & periodontal diseases.

Key words- Triphala, contemporary aid, dentistry, ayurvedic medicine.

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INTRODUCTION

Triphala is a traditional ayurvedic herbal medicine used to treat a wide range of medical as well as dental disease and disorder, it has significant immunostimulatory effects on cellular immune response, especially on natural killer cells and cytotoxic T cells.¹

Triphala (trī·phā·lā) is defined as Ayurvedic, herbal rasayana which is used to enhance youthful energy, strength, and vitality.

It was originated from the dried powder of three different fruits, hence its name is tri (Three) and phala (Fruit). Amla (*Emblica officinalis*), Harada (*Terminalia chebula*) and Bihara (*Terminalia bellirica*) these three when mixed together in equal parts make a proper Triphala.

Harada (*Terminalia chebula*) T. chebula is commonly known as black myrobalans in English, harada in Hindi, and samorthai in Thai. The ripe fruit is a hard glabrous drupe, 3-

5 cm. long, ellipsoid to oval in shape with yellowish orange brown, and containing a single seed, usually 2 cm. long and 1 cm. in diameter.²

Amla (*Emblica officinalis*) is a fruit which is obtained from a small tree that is often found in India. Along with *Terminalia chebula*, EO is seen to induce gastric emptying, amla has a broad spectrum of antimicrobial activity against a variety of test bacteria.

Bihara (*Terminalia bellerica*) constitutes of appreciable concentration of proteins and oils, also it is rich in the omega 3 essential fatty acid and linoleic acid.

Triphala contains several compounds that have been proposed to be responsible for its claimed health benefits including gallic acid, chebulagic acid, and chebulinic acid. There is preliminary evidence that Triphala contains antioxidant compounds tested in isolated cells and

rats but this has not been observed in human. It has been suggested that aqueous and ethanolic extract from the plants which are potential source of antimicrobial agent. With the continuous use of antibiotics, the pharmaceutical market is facing a decline in their use because of development of resistance for drugs by microorganisms. Phenomenon like this along with the toxicity possessed by antimicrobial leads to a synergistic effect. Thus new antimicrobial agents are needed to overcome any of these drawbacks.^{1,2}

Triphala is having properties of both nutritional as well as blood and liver cleansing actions. It has little function as a lubricating laxative as it possesses some anthroquinones which helps in stimulating bile flow and peristalsis movement. The nutritional aspect is very high as it contains vitamin C and linoleic oil. People having bowel irregularities due to liver and gall bladder congestion are seeking for purgatives and demulcent laxatives for those having intestinal dryness. Triphala is fruitful in all kinds of constipation except that caused by a lack of vital energy. Herbal healing is largely a matter of approach in which one approach may emphasize tonification while another emphasizes elimination. But overemphasizing tonification has one problem that it can lead to further stagnation and congestion in an excess condition. Emphasizing elimination through the overuse of purgatives is already deficient, as individual can further reduce the body's store of minerals and essential B vitamins and can also cause an imbalance of beneficial intestinal microorganisms which results in weakness due to chronic fatigue and anaemia.^{2,3}

HISTORY BEHIND TRIPHALA

Triphala is a staple of Ayurvedic (Indian) practice used for well over 2,000 years. It is made from the dried powder of three different fruits, hence its name: tri (Three) and phala (Fruit). Amla (*Emblica officinalis*), Harada (*Terminalia chebula*) and Bihara (*Terminalia bellirica*) are mixed in equal parts to make a proper Triphala.³

It is said of Triphala; "No mother? Do not worry so long as you have Triphala." Indian people believe that Triphala can care for the internal organs as a mother cares for her children. References to the use of Triphala can be found in the Sushrut Samhita, which is dated to 1500 BC. The Sushruta Samhita contains 184 chapters and description of 1120 illnesses, 700 medicinal plants and a detailed study on Anatomy.

ANTI BACTERIAL EFFECT OF TRIPHALA

The "streptococci" present in oral cavity are a very heterogeneous group of microorganisms inhabiting the oral cavity. Although they are considered commensals, most are opportunistic pathogens and have been linked with a variety of diseases or disorders, especially liver and brain infective endocarditis and abscesses. From the perspective of oral health, it is well established that microorganisms play an

important role in caries etiology. The streptococci present in oral cavity, especially *Streptococcus mutans* and *Streptococcus sobrinus* have been consistently found to be associated with dental caries in humans. Other microorganisms, such as *Streptococcus mitis* and *Streptococcus salivarius* have also been linked with the disease or absence of it. Their interplay within the dental biofilm is an important feature for the establishment and maintenance of the oral microbial flora and the development of a cariogenic dental plaque.⁴

Triphala has been proven to have antibacterial property, It is also said to possess anti-inflammatory antihistamine, antitumor, antioxidant, lowering blood pressure, lowering cholesterol, diuretic, digestive and laxative properties. This magical preparation has action on all the three components considered in Ayurveda - Kapha, Pitta, and Vata such a wide range of actions of triphala is supposed to be because of the 35 phytochemicals and 47 tannins which have been so far isolated from it.⁵

ANTIVIRAL EFFECTS OF TRIPHALA

Triphala has been found to have antiviral activity. Researchers have reported that *Terminalia* present in triphala protects epithelial cells against the influenza A virus, supporting the traditional use of *Terminalia* for helping in recovery from acute respiratory infections. *Terminalia* has also demonstrated therapeutic activity against herpes simplex virus (HSV) in in vivo tests.⁹ These findings prompted a team of Japanese researchers to investigate *Terminalia*'s effects on human cytomegalovirus (CMV). They found that *Terminalia* was effective in inhibiting the replication of human cytomegalovirus (CMV) in vitro and in immunosuppressed mice. Stating that "*Terminalia chebula* significantly suppressed MCMV (murine CMV) yields in lungs of treated mice," the researchers concluded that *Terminalia* may be beneficial for the prevention of CMV diseases in immunocompromised patients.⁶

ANTI OXIDANT EFFECTS OF TRIPHALA

Because *Emblica officinalis* fruit (commonly known as amla) is the world's richest source of natural vitamin C, researchers have attributed many of its traditional benefits to its antioxidant properties.¹³ In one study amla was found to be more effective than vitamin C in improving lipoprotein values and glucose tolerance. Volunteers given amla were compared to controls receiving 500 mg/day of vitamin C. After 8 weeks the amla group showed significant improvements in lipoprotein serum profiles, including increased HDL, decreased LDL, and lower total cholesterol levels.¹⁴ In addition to vitamin C, researchers at the Bose Institute in Calcutta, India have also isolated a number of tannins in amla that exhibit potent antioxidant activity. The antioxidant effects of amla present in triphala were measured

on the basis of their effects on rat brain concentrations of the oxidative free radical scavenging enzymes, catalase (CAT) glutathione peroxidase (GPX) and superoxide dismutase (SOD), and lipid peroxidation. The results were compared with effects induced by deprenyl, a selective mono-amine oxidase (MAO) B inhibitor with well documented antioxidant activity. Deprenyl and amla both effectively increased SOD, GPX and CAT activity, with concomitant decreases in lipid peroxidation when administered once daily for constant seven days. These results indicate that the antioxidant activity of aonla may derive from the tannoids of the fruits of the plant, which contains vitamin.⁸

ANTI TUMOR EFFECTS OF TRIPHALA

Triphala has become one of the highly potential herbal medicines in the treatment of cancer and prevention from cancer because all the three compositions of Triphala have been found to have anticancer properties. Although very little is known about this mechanism by which these plants act against the cancer cells, the anticancer effect of Triphala has been recently found and supported by the several lines of evidence from studies of each plant component individually.^{5,1}

Indian researchers have shown that extracts of amla present in triphala exhibit antitumor activity. Solid tumors which are induced by DLA (Dalton's lymphoma ascites) cells were reduced significantly when mice were fed either amla or an herbal preparation containing 50% amla. Amla extract was also shown to increase the life span of tumor bearing animals by up to 60%. The researchers found that the antitumor activity of amla may partially be due to its interaction with cell cycle regulation.⁹

ANTI MICROBIAL ACTIVITY OF TRIPHALA

Triphala helps in controlling dental plaque, microbial growth and gingival inflammation caused by the lactobacillus and Streptococcus mutans. Triphala controls plaque activity similar to Chlorhexidine mouthwash. The antimicrobial activity is due to ayurvedic formulation like Triphala Mashirecognized to phenolic compounds and tannins in triphala. The activity is similar to that of triphala as it hinders dose dependent growth of gram +ve and gram -ve bacteria. Triphala and its individual fruit components have a potent antibacterial action against a wide spectrum of bacteria. Which includes Staphylococcus aureus, pseudomonas aeruginosa, Klebsiella pneumonia isolated from HIV infected patient. Triphala and its individual components showed antibacterial effect on both gram+ve and gram-ve bacteria which suggests the access of active phytochemicals through both the bacterial cells walls. Aqueous extract has activity against *P.vulgaris* Aureus, *S.epidermidis*, mildly antibacterial against *B.subtilis*

S.typhimurium and negligible no inhibitory effect against *E.coli* and *E.aerogens*.¹⁰

The triphala show potent antibacterial activity against Staphylococcus aureus, E.coli, Pseudomonas aeruginosa, Staphylococcus epidermidis, Salmonella typhii, Enterobacter aerogenes Salmonella typhimurium. Triphala inhibits growth of Enterococci which causes nosocomial bacteremia, surgical wound/urinary tract infections. Triphala exhibited a large zone of inhibition against Enterococci.¹¹

TRIPHALA- A AID IN WOUND HEALING

The triphala extracted ointments shows significant wound closure because the granulation tissue shows increase in collagen fibres, hexosamine, uronic acid and also decrease in bacterial count. Collagen sponges incorporated with triphala shows increased thermal stability, water uptake capability, faster wound closure and improved tissue regeneration. The quick wound healing is due to interaction of Epigallocatechin gallate with collagen.^{9,1}

ANTI CARIOGENIC ACTION OF TRIPHALA

Though a plenty of anti-plaque agents are available in the market, their undesirable side-effect stimulated the search for alternate agents. Plants or plant products used in folk dental practices or prescribed in Unani, homeopathic, or Ayurvedic remedies are have gained popularity due to their medicinal properties.

Terminalia chebula helps in the prevention and treatment of various diseases effecting the oral cavity such as dental caries, spongy and bleeding gums, gingivitis, and stomatitis. Extract from the plant *t.chebula* can be used to prevent plaque formation on the surface of the tooth, by inhibiting the sucrose-induced adherence and the glucan-induced aggregation, which is responsible for the colonization of the organism on tooth surface. Thus, the extract act as an effective agent in the treatment of carious teeth with its ability to inhibit the growth and accumulation of *S. mutans* on tooth surface which further prevents the accumulation of acids on the tooth surface, and thus no more demineralization and the breakdown of the tooth enamel can occur.¹²

ROOT CANAL IRRIGANT TRIPHALA

Microorganism present in the oral cavity are responsible for primary endontic infection, which are usually pathogens that may invade a root canal opportunistically, which contains necrotic tissue and establish an infectious process. The number of facultative anaerobic bacteria start increasing when the root canal remains infected for longer time. *Enterococcus faecalis*, a facultative anaerobic gram-positive coccus, is the most common Enterococcus sp. Cultured from non-healing endodontic cases. Sodium hypochlorite (NaOCl) is an efficient irrigant used in eliminating *E. faecalis* biofilms *in vitro*, but the main

disadvantage of sodium hypochlorite is its high toxicity, unpleasant taste, and its inability to remove the smear layer. Triphala has shown significant anti-bacterial activity against three and six week biofilms. It would be beneficial to use herbal alternatives as a root canal irrigants, it might prove to be beneficial considering the several undesirable properties of sodium hypochlorite.¹³

TRIPHALA- AS A MOUTHWASH

Since ancient times ayurvedic drugs are being in use and triphala being one of them is also being used as oral rinses in periodontal therapy. Triphala as a mouthwash has a wide spectrum of activity which includes:

- Triphala can also be used as a rinsing agent in dental diseases.
- Triphala mouthwash with a concentration of 0.6% shows significant anti-caries activity, which is comparable to that of chlorhexidine with no disadvantage as staining of teeth .
- Triphala being more cost effective can be thought as a good alternative.¹⁴
- A significant reduction in the plaque, gingival, and oral hygiene indices has been noticed when triphala is combined with procedures such as scaling and root planning .¹⁴

CONCLUSION

Triphala is one of the most important rasayana drugs commonly used in Ayurvedic system of medicine. BhavprakashNigantu mentions triphala to be a mixture of equal proportions of three fruits namely; Emblica officinalis Gaertn (Euphorbiaceae), Terminalia bellerica Linn (Combretaceae) and Terminalia chebula (Combretaceae). According to Charaka Samhita daily consumption of the rasayana drug triphala for a period of one year makes a person survive for hundred years without any illness. Triphala is an esteemed drug in India which has been prescribed for centuries to cure a wide range of ailments. Triphala is a polyherbal formulation and the mechanism of action of polyherbals/herbal drugs and their extracts differ in many respects from that of the synthetic drugs or single substances. Triphala is effective in curing a wide range of ailments. Its potency as an anti-cancer drug, antibacterial, anti viral, anti microbial, it is also affective in prevention of caries, it can be used as root canal irrigant, as mouthwash, It also helps in wound healing & can also be used as anti oxidant. As there is lot of adulteration and substitution in the herbal market more studies and parameters for Quality Control of the individual ingredients and the compound formulation triphala needs to be established and carried out so as to ensure reliability and reproducibility of the formulation.

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