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PHYTOCHEMICAL ANALYSIS OF TRIPHALA EXTRACT: AN ANALYTICAL STUDY

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ABSTRACT

Triphala is one of the most important and potent Rasayana drug used in Indian System of Medicine. Triphala is a tridoshic rasyana having a balancing and rejuvenating effect on the three constitutional elements that constitute the human life. Triphala is rich in antioxidants, possess antibacterial, anti-viral, anti-cancer property. Triphala is also known to cure cataract and effective in treatment of Acquired immune deficiency syndrome (AIDS). Triphala is rich in many polyphenols, Vitamin C, and flavonoids. This review paper focuses on the phytochemical and therapeutic effect of triphala.

Keywords: Triphala, Rasayana, Immunomodulator, Antioxidant

INTRODUCTION:

Triphala is a drug widely used in many disorders due to its various pharmacological activities. Triphala is composed of the three drugs, *Terminalia chebula Retz*. (Haritaki),

Terminalia bellerica Roxb. (Bibhitaki) and *Emblica officinalis Gaertn.* (Amalaki) and is one of the most commonly used Ayurvedic preparations. The formulation generally consists of equal proportions of pericarps of this myrobalans **[1]**. Triphala has been described in the ancient Ayurvedic text as a Tridoshic Rasayana, a therapeutic agent with balancing and rejuvenating effects on the three humours or constitutional elements in Ayurveda vata, pitta and kapha. *Terminalia chebula Retz* and *Terminalia bellerica Roxb* have a Ushna bu nature, *while Emblica officinalis Gaertn*. is sheeta in nature. Triphala, being a combination of all three, is therefore balanced, making it useful as an internal cleansing, detoxifying formula. It is regarded as an important Rasayana and good purgative in Ayurvedic medicine. Recipe for this traditional herbal supplement is described in the traditional Indian texts, the Charaka and Susruta Samhita **[2]**. It is used as colon tonic, laxative, eye rejuvenator, anti-inflammatory, antiviral etc. **[3]**.

Qualitative test of Triphala Extract [4]:

Test for carbohydrates

Molish's test: To two ml of molish's reagent, 2ml of extracts were added and shaken well. To this another 2ml of concentrated sulphuric acid was added carefully through the sides of the test tube. Appearance of a reddish violet ring at the junction of the two layers indicate the presence of carbohydrates.

Test for tannins: To the extracts, a few drops of 10% ferric chloride solution were added. Appearance of a green or blue colour indicates the presence of tannins.

Test for steroids: Leaf extracts were mixed with 1 ml of chloroform and 2-3 drops of conc. H_2SO_4 were added to it. Appearance of a pink or red colour indicate the presence of steroids.

Test for alkaloids (Mayer's test): Extracts were treated with mayer's reagent (potassium mercuric chloride). Formation of a yellow coloured precipitate indicates the presence of alkaloids.

Test for flavanoids: The extracts were treated with conc. H_2SO_4 and formation of a yellowish orange colour indicate the presence of flavanoids.

Test for proteins (Xanthoprotein test): To the leaf extracts 20% NaOH solution were added and the formation of an orange colour confirms the presence of proteins which is characteristic for ammonia formation.

Test for fixed oils: Two drops of extracts were pressed between two filter papers. Appearance of an oil strain on the filter paper indicates the presence of cardiac glycosides.

Test for saponins (Foam test): Two ml of the extracts were diluted with 20ml of distilled

water, shaken vigorously and was observed for a stable persistent froth.

Test for phenolic compounds (Ferric chloride test): Two ml of diluted extracts were treated with dil. $FeCl_3$ solution. Appearance of a violet colour indicate the presence of phenol like compounds.

Test for amino acids (Ninhydrin test): Two drops of ninhydrin solution (10mg of ninhydrin in 200ml of acetone) were added to 2ml of aqueous filtrates. A characteristic purple colour indicate the presence of amino acids.

Test for gum and mucilage: To 100ml of each extract added 10ml of distilled water. To this 25ml of absolute alcohol was added with constant stirring. Appearance of a cloudy precipitate indicates the presence of gum and mucilage.

Phytochemical analysis results of Triphala churna:

Phenolic acids, flavonoids and tannins are the most commonly found polyphenolic compounds in the plant extracts. HPLC analysis and Folin-Ciocalteau and Folin-Denis method showed that triphala contains 38±3% polyphenols and 35±3% tannins. Triphala contains sufficient gallic acid and hence can be used as a marker compound for in-vivo studies. HPLC studies reveal the presence of four phenolics gallic acid (0.026% w/w), tannic acid (0.024% w/w), syringic acid (0.016% w/w) and epicatechin (0.013% w/w) along with ascorbic acid (0.036% w/w) in triphala. E.officinalis contained ascorbic acid (0.026%), gallic acid (0.081%), T.bellirica contained gallic acid (0.005% w/w), tannic acid (0.004% w/w) and ascorbic acid (0.023%), while T.chebula contained gallic acid (0.024% w/w), tannic acid (0.011% w/w), syringic acid (0.009% w/w) and epicatechin (0.0060% w/w) together with ascorbic acid (0.02%).Triphala contains numerous other phenols.

CONCLUSION:

Triphala is a powerful polyherbal formula with myriad efficacious therapeutic uses for maintaining homeostasis as well as the prevention and treatment of disease. Many scientific studies have reported evidence-based validation of various traditional uses of Triphala. It provides therapeutic value for multiple pathologies. Additional government funding allocations and support are needed for further and ongoing studies to validate its therapeutic uses in human clinical trials and to define the biological mechanisms relevant to this plant-based medicine. More widespread education of the general public and medical providers on clinical Ayurvedic medicine and complementary therapies such as Triphala is warranted to increase awareness of these

treatments for both clinical and healthy populations.

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