Triphala is regarded as an important rasayana in Ayurvedic medicine. Medicines of the rasayana group are believed to promote health, immunity, and longevity. According to Ayurveda, they strengthen all tissues of the body, prevent aging, promote intellect, and prevent disease. It consists of the dried fruits of three medicinal plants, Terminalia chebula, Terminalia belerica and Emblica officinalis, also known as the three myrobolans. Triphala means three (tri) fruits (phala). Triphala is used in Ayurvedic medicine in the treatment of a variety of conditions and also forms part of many other Ayurvedic formulations. The combined effect of three plants in triphala claimed to possess many pharmacological properties. This review mainly focuses on pharmacological and therapeutic uses of triphala and its constituents.

**Key words:** Triphala, Terminalia chebula, Terminalia belerica, Emblica officinalis

**INTRODUCTION**

Triphala is a tridoshic formula of fruits of *Terminalia bellerica* (Family: Combretaceae), *Terminalia chebula* (Family: Combretaceae) and *Emblica officinalis* (Family: Euphorbiaceae) [32]. According to Bhavaprakasha-Nighantu, triphala consists of equal parts of Haritaki, bibhitaki and amalaki. Sanskrit names for triphala are Phaltrika and vara. It pacifies cough, pitta, removes anomalies of urinary secretions, leprosy and eye complaints. It is pleasant, appetizer and nullifies fever of malaria, typhoid and pneumonia. According to Kaiyadev-Nighantu, triphala consists of one haritaki, two bibhitaki and four fruits of amalaki [33]. According to Charuk-Samhita, "After having digested previously taken meals, one should take one fruit of haritaki every morning, two fruits of bibhitaki before taking next meal and four fruits of amalaki along with honey and ghee after having taken meals. All three fruits should be grinded, mixed and taken along with honey and ghee. Daily consumption of this triphala Rasayana for one year makes a person to live for hundred years without any illness and aging" [34]. According to Sushrut-Samhita, "Triphala is useful in the treatment of cough, pitta, diabetes, ailments of eyes, skin diseases, intermittent fevers and indigestion" [35].

**Therapeutic Uses of Triphala**

Research work done on triphala has proved its efficacy as an anti-oxidant, immunomodulator, rejuvenator, anti-aging, analgesic, anti-mutagenic, anti-cancerous, anti-microbial and blood purifier. It is used in the treatment of cancer, constipation, indigestion, headache, inflammation, rheumatism, diabetes, leucorrhoea, ailments of eyes, skin diseases, dyspepsia, and liver enlargement etc. It removes tridosh and also flushes out harmful toxins from our body. It also balances cholesterol and removes excess fat from our body [36-37]. Triphala removes all types of diseases, enhances intelligence, and promotes longevity and memory [38]. In India, it is a highly esteemed drug which is being consumed from centuries in the treatment of a wide range of ailments [39].

**Description of Individual Ingredients of Triphala**

*Terminalia chebula* (Fam. Combretaceae)

Sanskrit names for *Terminalia chebula* are ahbha, pathya, kayastha, putra, amrit, haimvati, avyatha, chetaki, shreyasi, shiha, vyaytha, vijaya, jeevanti and rohini [40]. It is known as Chebulic myrobalan in English; harad and harra in Hindi; haritaki in Bengali; kadakaki and harakakk in Tamil; karitaki in Telugu; karutikka in Malayalam; lilika in Assamese; alaklekiy in Kannada; harida in Oriya and halela in Kashmiri and Urdu [32-33].

**Occurrence & Distribution**

It belongs to family Combretaceae and is abundant in North India from Kangra and Kumaon to Bengal and Southwards to the Deccan upto an altitude of 6000 ft. in Travancore, higher forests of Bombay ghat, Satpuras, Belgaum and Kanara. It is also found in Madhya Pradesh, North India, Gujarat and Maharashtra [20-21].

**Botanical Description**

It is a middle-sized deciduous tree with dark-brown bark. Leaves are 10-20 cm long, ovate, ovoid, acute, opposite with two small glands near leaf-base. Flowers are dull white in spikes at the ends of branches. Fruits are intact, yellowish-brown, ovate, 2-4 cm long and 1.5-2.5 cm broad, drupe having longitudinal wrinkles whereas pericarp is fibrous 3-4 mm thick, non-adherent to the seed. Flowering takes place between April to August and fruit ripens form October- January [20-23].

**Ethynotbological Studies**

In Gangtok, fruits are consumed as a natural remedy for cold and cough [34]. It is used as an antiulcerative drug in folklore medicine of Assam and Tirap district of Arunachal Pradesh [35]. In Terai region of Gorakhpur district (U.P.), it is used in the treatment of eye disorders [36]. In Purulia district of West Bengal, it is used as a traditional medicine for treatment of dysentery while Irulars of Tamil Nadu (India) use its fruits for treating indigestion [37]. Tribals of Mizirap district (U.P.), use its fruit in colic and menstrual complaints [38]. It is used as a purgative in Chandrapur district of Khet Taluka (Maharashtra), and Dehradun and Siwalik [39]. It is used in the treatment of pneumonia in Abujh-Marh area of Madhya Pradesh [40]. In Upper East Godavari district of Andhra Pradesh, it is used to get relief from sore throat [41]. In Khnadala (Maharashtra), it is used in stomach complaints [41].

**Chemical Constituents**

Fruits of *Terminalia chebula* are reported to contain tannins (30-40%), chebulic acid, gallic acid, resin, anthraquinones, carbohydrates, glucose, sorbitol, saponins, anthranols, ellagic acid, chebulic acid, beta-D-glucogallin, terchebin, 1,3,6-trigalloylglucone, pentagalloylglucose, fructose, sucrose, genitoibiose, traces of arabinose, maltose, rhamnose and xylose, amino acids, phosphoric, succinic, quinic, shikimic, dihydro and dehydroshikimic acids, esters of palmitic, oleic and linoleic acids, punicalagin, chebulin, corilagin, neochelbulic acid, chebulagic acid and 1,2,3,4,6-penta-o-galloyl-beta-D-glucose [42-46].

**Ayurvedic Uses of Haritaki**

Haritaki is acidic in nature and pacifies vata, being madhura and tikta, it pacifies pitta and as it is kasyaya and ruchina, it pacifies cough [47].

**Therapeutic Uses**

It is stomachic, digestive, diuretic, carminative, astringent, laxative, antioxidant, photoprotective, hepatoprotective, anti-septic, anti-inflammatory, anti-pyretic, anti-anaphylactic, anti-microbial, anti-cancerous, homeostatic, anti-tussive, rejuvenator, anthelmintic, anodyne and purgative. It is also useful as blood purifier and is used in the treatment of chronic ulcers, wounds, stomatitis, bleeding and ulceration of gums, healing of wounds, peptic ulcers, fever, skin and eye diseases, anaemia, hypertension, heart-diseases, ascites, diarrhea, nausea, bowel complaints, cough, diarrhea and dysentery, haemorrhoids, hoarseness, asthma, constipation, headache, diabetes, leucoderma, enlarged liver, AIDS, acidify, piles, mumps, vaginal irritation and inflammations [44-53].

*Terminalia belerica* (Fam. Combretaceae)

Hindi name of *Terminalia belerica* is bibhitaki. Kalidrum, kapavriks, samvarta and aksha are the different other Sanskrit names of bibhitaki [44]. Other Sanskrit names for bibhitaki are *bibhitakam*, *sahajakam* and *abharakam*. Beleric myrobalan in English; baheera in Bengali; akkam and thani in Tamil; tandra and tadi in Telugu; tushan in Malayalam; hullich or bhovian in Assamese; taremara in Kannada; bahedan in Gujarati and bahera in Punjabi [48].

**ABSTRACT**

Triphala is regarded as an important rasayana in Ayurvedic medicine. Medicines of the rasayana group are believed to promote health, immunity, and longevity. According to Ayurveda, they strengthen all tissues of the body, prevent aging, promote intellect, and prevent disease. It consists of the dried fruits of three medicinal plants, *Terminalia chebula*, *Terminalia belerica* and *Emblica officinalis*, also known as the three myrobolans. Triphala means three (tri) fruits (phala). Triphala is used in Ayurvedic medicine in the treatment of a variety of conditions and also forms part of many other Ayurvedic formulations. The combined effect of three plants in triphala claimed to possess many pharmacological properties. This review mainly focuses on pharmacological and therapeutic uses of triphala and of its constituents.

**Neeraj Verma**, Anil Pratap Singh*, P. K. Sahu, Arpita Singh*, Neelam Mishra*

*Goel Institute of Pharmacy & Sciences, Faizabad Road [Near Indira Canal] Lucknow 227105, Uttar Pradesh, India
School of Pharmaceutical Sciences, Siksha ‘O’ Anusandhan University, Kalinga Nagar, Ghatikia, Bhubaneswar 751003, Orissa, India
Pharmacognozsy and Ethnopharmacology Division, National Botanical Research Institute [Council of Scientific and Industrial Research], Rana Pratap Marg, P.O. Box No. 436, Lucknow 226001, Uttar Pradesh, India

Received on: 05-10-2010; Revised on: 14-12-2010; Accepted on: 09-02-2011

**Corresponding author.**
Neeraj Verma
Goel Institute of Pharmacy & Sciences, Faizabad Road (Near Indira Canal) Lucknow 227105, Uttar Pradesh, India

ISSN: 0974-6943
Available online through
http://jprssolutions.info

Review on wonderful and miraculous Triphala


*Goel Institute of Pharmacy & Sciences, Faizabad Road [Near Indira Canal] Lucknow 227105, Uttar Pradesh, India
School of Pharmaceutical Sciences, Siksha ‘O’ Anusandhan University, Kalinga Nagar, Ghatikia, Bhubaneswar 751003, Orissa, India
Pharmacognozsy and Ethnopharmacology Division, National Botanical Research Institute [Council of Scientific and Industrial Research], Rana Pratap Marg, P.O. Box No. 436, Lucknow 226001, Uttar Pradesh, India


690-694
Ethnobotanical Studies
In Sagar district of Madhya Pradesh, it is traditionally used as laxative and purgative in the treatment of fever, diarrhea, piles and dropsy [105]. In Daham forest division of Maharashtra and Saurashtra in Gujarat, it is used in the treatment of asthma and bronchitis [106]. It is used as a coolant and anti-leprotic drug in Lodha medicine in Mindnapur district in West Bengal [106]. In Abujh-Morh area of Madhya Pradesh, it is used to get relief from constipation [107]. Tribals of Maharashtra use it to get relief from cough [108]. It is consumed as an anti-diabetic drug in Assam and Tirap district of Arunachal Pradesh [109]. It is considered laxative and purgative in Chandrapur district of Maharashtra, Saurashtra in Gujarat, Dehradun and Siwalik district of Uttar Pradesh [107]. In Garhwal, it is considered diuretic, laxative and coolant [110]. It is used as a coolant and anti-leprotic drug and to spell intestinal worms [111]. According to Bhavaprakasha-Nighantu, other Ayurvedic uses of Amalaki

Therapeutic Uses
It is used as a coolant and anti-leprotic drug in Lodha medicine in Mindnapur district in West Bengal [106]. In Abujh-Morh area of Madhya Pradesh, it is used to get relief from constipation [107]. Tribals of Maharashtra use it to get relief from cough [108]. It is consumed as an anti-diabetic drug in Assam and Tirap district of Arunachal Pradesh [109]. It is considered laxative and purgative in Chandrapur district of Maharashtra, Saurashtra in Gujarat, Dehradun and Siwalik district of Uttar Pradesh [107]. In Garhwal, it is considered diuretic, laxative and coolant [110]. It is used as a coolant and anti-leprotic drug and to spell intestinal worms [111]. According to Bhavaprakasha-Nighantu, other Ayurvedic uses of Amalaki

Pharmacological Studies Done On triphala
As an anti-diabetic agent

As a radioprotective agent

As an anti-mutagenic agent
A study to evaluate an antimutagenic potential of water, chloroform and acetone extracts of triphala was made in an Ames histidine reversion assay using TA 98 and TA 100 tester strains of Salmonella typhimurium against the direct-acting mutagens, 4-nitro-O-phenylenediamine (NPD) and sodium azide, and the indirect-acting promutagen, 2-aminofluorene (2AF), in the presence of phenobarbital-induced rat hepatic S9. The drug was sequentially extracted with water, acetone and chloroform at room temperature. The study revealed that water extract was ineffective in inducing the revertants induced by the mutagens. The results with chloroform and acetone extracts showed inhibition of mutagenicity induced by both direct and S9-dependent mutagens. A significant inhibition was observed with acetone extract against the revertants induced by S9-dependent mutagen, 2AF; in co-incubation mode of treatment. Various spectroscopic techniques, namely 1H-NMR and 13C-NMR, distortionless enhancement by polarization transfer (DEPT-90) and DEPT-135, UV and IR are under way to identify the polyphenolic compounds from an acetone extract [118].

Gentocin evaluation of extracts from triphala along with three other plants was done employing the VITOTOX and comet tests which detects DNA damage in prokaryotic and eukaryotic test species. In the VITOTOX test, none of the extracts were identified as genotoxic. Extract from triphala significantly increased DNA damage in a concentration above 500 ppm [119].
Antioxidant activity and Free radical scavenging activity

Treatment of mice with triphala once daily for 5 consecutive days before irradiation delayed the onset of mortality and reduced the symptoms of radiation sickness when compared with the non-drug double distilled water treated irradiated controls.[130]

The nitric oxide (NO) scavenging activities of triphala and some other drugs, was done using sodium nitroprusside as a NO donor in-vitro. All the drugs tested demonstrated direct scavenging of NO and were superior to Gingko biloba, which was used as a positive control. The extract exhibited dose-dependent NO scavenging activities. Triphala may be potent and novel therapeutic agent for scavenging of NO, and thereby inhibit the pathological conditions caused by excessive generation of NO and its oxidation product, peroxynitrite.

The aqueous extract of the fruits of Emblica officinalis, Terminalia chebula and Terminalia belerica and their equiproportional mixture triphala were evaluated for their in-vitro anti-oxidant activity. The extracts were found to possess the ability to scavenge free radicals such as DPPH and superoxide. Emblica officinalis shows greater efficiency in lipid peroxidation and plasmid DNA assay, while Terminalia chebula has greater radical scavenging activity. Thus, their mixture, triphala, is expected to be more efficient due to the combined activity of the individual components.[131]

Effect of triphala on oxidative stress and on cell mediated immune response against noise stress signal was studied[132] and followed up by a significant suppression of the growth of cancer cells in cytotoxic assay was studied by Kaur et al[133] which was used as a positive control.

Evaluation of inhibition activity of triphala on PMN-type matrix metalloproteinase (MMP-9) expressed in adult periodontitis patients and comparison of its activity with another Ayurvedic drug, kamillawon, and doxycycline, which has known inhibitory activity, was done by Abraham et al[134].

Suppression of the growth of cancer cells in cytotoxic assay was studied by Kaur et al[135] and it was concluded that it may be due to the gallic acid-a major polyphenol observed in “Triphala”. Chemopreventive potential of triphala on benz(a)pyrene induced fore stomach tumorigenesis in murine tumor model system was studied by Deep et[136].

Immunomodulatory activities

The immunomodulatory activities of triphala were assessed by testing the various neutrophil functions like adherence, phagocytosis (phagocytic index (PI) and aciditify index (A.1)) and nitro blue tetrazolium (NBT) reduction in albinos rats. Noise (100dB) stress for 4h/d for 15i, was employed to alter the neutrophil functions. The neutrophil function tests and corticosterone levels were carried out in eight different groups of animals, namely control, triphala, noise-stress, triphala noise-stress, and corresponding immunized groups are used. Sheep red blood cells (SRBC 5 × 10^9) cells/ml were used for immobilising the animals that belong to immunized groups. In triphala administration, A.1 was found to be significantly enhanced in the triphala group, while the remaining neutrophil functions and steroid levels were not altered significantly enhanced in the triphala immunized group with a significant decrease in corticosterone levels was observed. Upon exposure to the noise-stress, the neutrophil functions were significantly altered. In triphala administration, a significant increase in the corticosterone levels were observed in both the noise-stress and the noise-stress immunized groups. These noise-stress-induced changes were significantly prevented by triphala administration in both the triphala noise-stress and the noise-stress immunized groups. The study has divulged that oral administration of triphala appears to stimulate the neutrophil functions in the immunized rats and stress-induced suppression in the neutrophil functions were significantly prevented by triphala[137].

References


82. Ahmad I, Mehmood Z and Mohammad F (1998) Screening of some Indian medicinal plants for


86. Thakur KC, Majumdar R and Bhattacharjee S (1979) Folklore medicines from Assam and Arunachal Pradesh (district Tirap). Quart J Econ Tax Bot 17:61-76.


Source of support: Nil, Conflict of interest: None Declared