

INTERNATIONAL JOURNAL OF INSTITUTIONAL PHARMACY AND LIFE SCIENCES

Pharmaceutical Sciences

Review Article.....!!!

Received: 03-08-2012; Revised; Accepted: 09-08-2012

HALELAH SIYAH (*TERMINALIA CHEBULA* RETZ): IN UNANI SYSTEM OF MEDICINE AND MODERN PHARMACOLOGY: A REVIEW

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Keywords:

Halelalah siyah, Triphala,
Muqawwi dimag, Unani
medicine

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ABSTRACT

The fruit of *Terminalia chebula* Retz also called Halelah siyah in Unani system of medicine is being used for the treatment of different types of diseases and disorders since antiquity. *Terminalia chebula* Retz is called “the king of medicine” because of its extraordinary powers of healing with a wide spectrum of biological activity. *Terminalia chebula* Retz is prescribed alone or in combination with Emblic and Beleric Myrobalans in a vast number of diseases, and are called “*triphala*” or the three fruits in Sanskrit. During the last five decades, apart from the chemistry of *Terminalia chebula* Retz constituents, considerable progress have been achieved regarding the biological activity and therapeutic use of *Terminalia chebula*. *Terminalia chebula* Retz fruits contain astringent substances like gallic acid, chebulic acid, chebulanin, neochebulanic acid, ellegic acid, chebulagic acid, chebulinic acid, etc. This is the first kind of review on the Halelah siyah, giving detailed description with reference to Unani system and modern pharmacology.

INTRODUCTION

Terminalia chebula Retz is a plant species belonging to the genus *Terminalia*, family *combretaceae*. It is a flowering evergreen tree called black myrobalan in English, Haritaki in Sanskrit and Bengali. It is native to Indian sub continent and adjacent areas of Pakistan, Nepal, and the south-west of china stretching as far as south Kerala or even Srilanka where it is called as *Aral*.^{1,2,3,4} The Sanskrit name ‘*Haritaki*’ is rich with meaning; it refers to the yellowish dye (*harita*) that it contains, also indicates that it grows in the abode of the god Shiva (Hari, i.e. the Himalayas), and it cures all diseases.⁵ Its other commonly used Sanskrit name, *Abhaya*, refers to the ‘fearlessness’ it provides in the face of disease. Indian writers describe seven varieties of Haritaki, which refers to the same fruit in different stages of maturity. Very large fruits are considered particularly valuable, and fetch a fancy price. *Terminalia chebula* Retz is prescribed alone or in combination with Emblic and Beleric Myrobalans in a vast number of diseases, and are called “*triphala*” or the three fruits in Sanskrit. *Terminalia chebula* Retz is called “the king of medicine” in Tibet because of its extraordinary powers of healing with a wide spectrum of biological activity.^{4,5,6,7} Myrobalans were known to the early Arabian writers and through them to the Greek writers Actuaries, mention five kinds.⁷ The fruit of *Terminalia chebula* Retz is being used for the treatment of different types of diseases and disorders since antiquity. During the last five decades, apart from the chemistry of *Terminalia chebula* Retz constituents, considerable progress have been achieved regarding the biological activity and therapeutic use of *Terminalia chebula*. It is now considered a valuable source of unique natural products for medicines against various diseases and also for the development of industrial products. According to Indian mythology, this plant originated from the drops of *ambrosia* (Amrita) which fell on earth when Indra was drinking it.^{5,6} In Unani system of medicine there are at least three types of the fruit of *Terminalia chebula* Retz which are used in different types of diseases. These are small type of black colour, yellow type and the large type (Halelah kabuli).^{8,9,10,11}

Habit and Habitat

Terminalia chebula Retz occurs scattered in teak forests, mixed deciduous forests and is extending in to forests of comparatively dry types. It occurs at an altitude of up to 1500-2000m. The species is found on a variety of soils, clayey as well as shady.^{12,13} It is found in sub-Himalayan tracts from the river Ravi Eastwards to west Bengal and Assam and is also found in central and south India.¹⁴

Botanical Description

Kingdom	:	Plantae
Division	:	Magnoliophyta
Class	:	Magnoliopsida
Order	:	Mystles
Family	:	<i>combretaceae</i>
Genus	:	<i>Terminalia</i>
Species	:	<i>Terminalia chebula</i>
Binomial Name	:	<i>Terminalia chebula</i> Retz. ⁵

Vernacular names

Unani name	:	Halelah Siyah
Cambodian	:	Sa mao tchet
Chinese	:	He Li Le
Portuguese	:	Mirabolanos
French	:	Myrobalan noir
Malaysian	:	Manja puteri
Hindi	:	Harrad
Sanskrit	:	Haritaki
Malayalam	:	kaddukkai
Telgu	:	karakkai
Tamil	:	Kadukkai
Bengali	:	Haritaki
Kannada	:	Alalekay
Punjabi	:	Halela
Kashmiri	:	Halela
Pahari	:	Hana
English	:	Chebulic Myrobalan. ^{7,8,9,11}

Morphological Description

Terminalia chebula Retz is a medium to large deciduous tree attaining a height of up to 30 m, with widely spreading branches and a broad roundish crown. Leaf buds, branchlets and youngest leaves with soft, shining, generally rust coloured hairs. Leaves 7-20cm by 4-8cm, glabrous or

nearly so when mature, not clustered, distant, alternate or sub opposite, elliptic oblong, acute, rounded or cordate at base, penninerved, secondary nerves 6-8 pairs, arching, prominent; petioles 2-5cm long, pubescent, usually with 2 glands near the top. Flowers are hermaphrodite, 4mm across, sessile, dull-white or yellow, with an offensive smell. Spikes are sometimes simple, usually in short panicles, terminal and in the axils of the uppermost leaves; bracts exceeding the flowers, subulate or lanceolate, hairy, conspicuous among the buds but soon deciduous. Wood is very hard, brownish grey with a greenish or yellowish tinge, with irregular small dark purple heartwood, close-grained.¹

Macroscopic characteristics

The fruits are glabrous, ellipsoid to ovoid drupes, yellow to orange brown in colour, containing a single angle stone. The crude drug consists of immature fruits of various sizes and is usually shrivelled black, ovoid, brittle, 1.5-2 cm in length. Fracture brittle and shining, taste of pulp astringent and odour agreeable.¹⁴

Microscopic characteristics

The epidermis consists of a single layer with rectangular and tangentially elongated cells. Epidermal cells are covered with a thin cuticle. Under the epidermis the outer mesocarpic region consists of 6-10 layers of cells which are filled with abundant starch grains and tannin. Sclerified cells which are about 4-6, thick and arranged tangentially in the mesocarpic region. These sclerified cells are thick-walled, lignified and elongated. Below the sclerenmatous layer occurs a layer of 20-25 thick mesocarpic cells which are parenchymatous in nature, oval to round in shape and are filled with starch grains and tannins. At certain places in the mesocarp there are vascular strands. The mesocarpic cells contain abundant rosettes of calcium oxalate. Starch grains, present in cells of outer and inner mesocarpic region, are simple or compound, oval to round.¹⁴

For practical purposes, the fruit of *Terminalia chebula* Retz is of three types. Actually these are the different stages of maturity of fruits:

- (a) Small myrobalan -the unripe fruit
- (b) Yellow myrobalan -after the development of seed, the adult stage of the fruit
- (c) Large myrobalan -the fully matured fruit.^{8, 15}

Parts used Fruits^{8, 16, 17}

Mazzarat (Side Effect)

In Unani system excess dose of Halela siyah is considered harmful for liver.^{9, 11}

Miqdaare Khurakh (Dosage in Unani)

Decoction (*Joshanda*) in the dose of 30 ml to 80 ml

Powder 3gm to 14 gm ^{8,11}

Mizaj (Temperament)

The mizaj (temperament) of Halelah siyah is Cold^{1°} and Dry^{2°} ^{8, 9, 11}

Af'aal (Actions) in Unani Medicine

Muqawwi dimag (brain tonic), Musaffi dam (blood purifier), Qabiz (astringent), Muqawwie meda wa aama (stomach/ intestinal tonic), Mushil Sauda (apprient), Mufarrehe wa Muqawwi qalb, (cardio tonic) ^{8,9,10,18}

Medicinal uses in Unani system and Ethno-medicine

The fruit of the Chebulic Myrobalan tree is used as a medicine and has wide application in various diseases in Unani system of medicine.

According to the Unani system of medicine Halela siyah is beneficial in *istirkha* (paralysis), *Izme Tehal* (splenomegaly), *Bawaseer* (piles), *Malikholia* (melancholia), *Juzam* (leprosy), coarsely powdered fruit with almond oil is *Mulayyin* (laxative).^{8,9,11,14} Stomachic, tonic, carminative, expectorant, anti helminthic, anti dysenteric. It is useful in asthma, sore throat, thirst, vomiting, hiccough, eye diseases, diseases of heart and bladder, strangury, vesicular calculi, urinary discharges, ascites, biliousness, inflammations, tumors, bleeding piles, typhoid fever, leucoderma, dyspnea, itching, pain, constipation, anaemia, gout, elephantiasis, and delirium.^{8,11}

It has been found that the age of the fruit at which it is obtained from the plant also effects its medicinal properties e.g., unripe fruit is found to possess astringent and aperients properties, and hence useful in dysentery and diarrhoea. Also the ripe fruit being purgative, tonic and carminative is used for diseases of spleen, blood nourishment, piles, brain tonic, cold in the head, ophthalmia, and gum diseases and in paralysis. ^{8,10,11}

Fine powder of the *Terminalia chebula* Retz is used as dentifrice, for carious teeth, ulcerations and bleeding of the gums. Coarse powder of the fruit when smoked in a pipe is found to afford relief in a fit of asthma. A fine paste of the fruit along with corn oil is applied to burns and scalds. Water obtained after putting the fruit overnight is found to have a cooling effect on the eyes. For the snake-bite, the fruit is found effective in combination with some other drugs. ^{1, 2, 3,}

^{8,10} *Terminalia chebula* Retz is also used to promote strength and preventing the effects of aging.

Its paste with water is found to be anti inflammatory, analgesic and having purifying and healing

capacity for wounds and hence used in hemorrhoids.^{3, 7, 8, 11} *Terminalia chebula* Retz fruit decoction is used as gargle in oral ulcers, sore throat, and astringent dentifrice in loose gums, bleeding and ulceration in gums. It is used as stomachic, as digestive aid, liver stimulant, as gastrointestinal prokinetic agent and mild laxative.^{1,3,8,11} The Chebulic acid from *Terminalia chebula* Retz fruit has shown antispasmodic action, and has mild laxative action.^{2,3,7,19,20} It is a good nervine and is used in weakness, nervous irritability and enhances the function of five senses.^{2, 7, 8, 19, 20} It has wide application in various skin ailments like urticaria, allergies and other erythematous disorders.²¹

Modern Pharmacological studies

Terminalia chebula Retz fruits exhibited antibacterial activity against a number of bacterial species.²² It is effective in inhibiting the urease activity of *Helicobacter pylori* (*H. pylori*), an ubiquitous bacterium implicated in the development of gastritis, ulcers and stomach cancer.²³ Antibacterial activity of *Terminalia chebula* Retz against both Gram positive and Gram negative human pathogenic bacteria has also been reported.²⁴ Gallic acid and its ethyl ester isolated from the ethanolic extract of *Terminalia chebula* Retz showed antimicrobial activity against methicillin-resistant *Staphylococcus aureus*. It has also growth inhibitory action against *Salmonella typhi* and intestinal bacteria.^{25,26}

Terminalia chebula Retz aqueous extract has antifungal activity. It has been found to be effective against *Candida albicans* and dermatophytes *Epidermophyton*, *Floccosum*, *Microsporum gypseum* and *Trichophyton rubrum*.²⁷ *Terminalia chebula* Retz fruits afforded four immunodeficiency virus type 1 (HIV-1) integrase inhibitors, gallic acid and three galloyl glucose. Their galloyl moiety plays a major role for inhibiting against the 3'-processing of HIV - 1 integrase of compounds.²⁸ *Terminalia chebula* Retz has also retroviral reverse transcriptase inhibitor activity.²⁹ It protects epithelial cells against influenza A virus, supporting its traditional use for aiding in recovery from acute respiratory infections.³⁰ It also showed inhibitory activity on the effects of immunodeficiency virus-1- transcriptase.³¹ *Terminalia chebula* Retz has demonstrated therapeutic activity against Herpes simplex virus (HSV) both in vitro and in vivo tests.³² *Terminalia chebula* Retz has inhibitory action on cancer cell growth by the phenolics and found that chebulinic acid, tannic acid, and ellagic acid were the most growth inhibitory molecules.³³ The different compounds of *Terminalia chebula* Retz exhibited antioxidant activity at different magnitudes of potency.³⁴ The aqueous extract of the fruit possess protective effects

on the tertbutyle hydroperoxide (t-BHP)-induced oxidative injury observed in cultured rat primary hepatocytes and rat liver.³⁵ It has strong antioxidant activity than alpha – tocopherol; HPLC analysis with diode array detection indicated the presence of hydroxybenzoic acid derivatives, hydroxycinnamic acid derivatives, flavonol aglycones and their glycosides, as main phenolic compounds.³⁶ *Terminalia chebula* Retz was found to possess antianaphylactic activities as it reduced the serum histamine levels in animals after induction of anaphylactic shock.³⁷ It also possessed hypocholesterelomic activity against cholesterol-induced hypercholestermia and atherosclerosis in rabbits.³⁸ *Terminalia chebula* Retz has a protective effect on the gastrointestinal mucosa, with the improvement in the secretory status of Brunner's gland involved in the protection against duodenal ulcer.³⁹ *Terminalia chebula* Retz extract was found to prevent the hepatotoxicity caused by the administration of rifampicin (RIF), isoniazid (INH) and pyrazinamide (pza) combination in subchronic model.⁴⁰ The ethanolic extract of *Terminalia chebula* Retz fruit exhibited a notable cytoprotective effect against UVB – induced oxidative damage.⁴¹ *Terminalia chebula* Retz resulted in the reduction of peroxidation of membrane lipids in the mice liver as well as decrease in radiation induced damage to DNA in mice who were given aqueous extract of the fruit prior to whole body irradiation.⁴² *Terminalia chebula* Retz fruit exhibited dose dependent reduction in blood glucose of streptozotocin induced diabetic rats both in short term and long term study and also had retenoprotective activity.⁴³ The fruit possess purgative action due the presence of oil fraction.⁴⁴ *Terminalia chebula* Retz aqueous extract produced an increase in humoral antibody (HA) titre and delayed type hypersensitivity (DTH) in mice.⁴⁵ *Terminalia chebula* Retz is possessing anti amoebic activity against *Entamoeba histolytica*.⁴⁶ *Terminalia chebula* Retz aqueous extract used as an mouth wash was found to significantly reduce both total bacterial counts and Streptococcal counts in saliva samples.⁴⁷

Phytochemical studies of the particular part used

Terminalia chebula Retz fruits contain astringent substances like Chebulic acid, chebulagic acid, corilagin and gallic acid.^{48, 49} Tannins of *Terminalia chebula* Retz are of pyrogallol (hydrolysable) type. The various components of hydrolysable tannins are gallic acid, chebulic acid, punicalagin, chebunanin, corilagin, neochebularic acid, ellegic acid, chebulagic acid, chebulinic acid, 1,2,3,4,6-penta-Ogalloyl- β -D-glucose, 1,6,-di-O-galloyl-D-glucose, casuarinin, 3,4,6-tri-galloyl-Dglucose, terchebulin.^{1,2,3,50} Total tannin content of *Terminalia chebula* Retz

fruit is 32%.⁵¹ The tannin content of *Terminalia chebula* Retz varies with geographical variation.^{1,2,3,52} In addition to fructose, amino acids, succinic acid, betasitosterol, resin, there is anthroquinone and sennosides which are purgative in nature.⁵³ Flavonol glycosides, triterpinoids, coumarin conjugated with gallic acids called chebulins as well as other phenolic compounds are also present.^{54, 55}

Phytochemical studies have shown that the fruit of *Terminalia chebula* Retz. contains different pharmacologically active constituents, like gallic acid, chebulic acid, punicalagin, chebunanin, corilagin, neochebulanic acid, ellegic acid, chebulagic acid, chebulinic acid, 1,2,3,4,6-penta-Ogalloyl- β -D-glucose, 1,6,-di-O-galloyl-D-glucose, casuarinin, 3,4,6-tri-galloyl-Dglucose, terchebulin.^{1,2,3}

CONCLUSION

The fruit of *Terminalia chebula* Retz has been used in a multitude of diseased conditions since from ages. The medicinal property of the *Terminalia chebula* Retz has been variedly described in different types of traditional medicines like Unani, Ayurveda, European and American. “*Triphala*” or the three fruits in Sanskrit which consist of *Terminalia chebula* Retz in combination with Emblic and Beleric Myrobalans is recommended in various diseased conditions. Myrobalan is known to the early Arabian writers and is given detailed medicinal uses in the Unani system of medicine.

Thus it is obvious that extracts of Halela siyah (*Terminalia chebula* Retz) contain constituents that have a versatile clinical application in the management of various disorders and in future can be a potential source for various medicines.

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