Therapeutic review of Haritaki, a short review based on Ayurveda perspective

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ABSTRACT

Terminalia chebula Retz (Combretaceae) is a medicinal plant widely distributed throughout India**,** Buma, and Srilanka. Many Indian plants have been used from time immemorial to treat various diseases and infections in traditional medicinal systems. This plant commonly used in traditional systems of medicinal in India sub-constituent. *Terminalia chebula* is called as 'King of medicine' in Tibet and is always listed at the top of the list in Ayurvedic material medica due to its extraordinary power of healing. This review attempts to summarize the various pharmacological and biochemical studies on *Terminalia chebula* which gives a wide knowledge about the herb and their importance in personal health care and hygiene.

Keywords: *Terminalia chebula*, tri-terpinoids, anti-cancer activity, carcinogenic

INTRODUCTION

Herbal system of medicines has been the oldest method of treatment since ancient times because of its rich diversity and fewer side effects. In addition, immense improvements have been observed in modern systems of medicine, but herbal drugs offer a rich source for health care to prevent the patients amongst different pathological states. [3,4] *Terminalia chebula,* commonly known as Harad related to family combretaceae, is a deciduous tree growing to 30 m tall, with

a trunk up to 1 m diameter. 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 fruit is drupe-like, 2-4.5 cm long and 1.2-2.5 cm broad, blackish, with five longitudinal ridges. *Terminalia chebula* native to southern Asia from India and Nepal east to southwestern China (Yunnan), and south to Sri Lanka, Malaysia and Vietnam.In central India, where trees are leafless for short period between April and August and fruiting from November to February; while in Karnataka, flowering and fruiting occurs from January to September. Moreover, various pleiotropic effects such as antioxidant, antidiabetic, renoprotective, hepatoprotective, antianaphylactic, immunomodulator and prokinetic have been found to be associated with the plant. The review outlines the various phytochemical constituents exhibited by the plant extracts. In addition, the pleiotropic pharmacological and therapeutic effects of the plant have been critically discussed[1].

Scientific Classification.

Its classification is Kingdom:Plantae,

Division: Magnoliophyta,

Class: Magnoliopsida,

Order: Myrtales,

Family: Combretaceae,

Genus: Terminalia, and

Species: Chebula.

Phytochemical Compositions of T. chebula

Hydrolysable Tannins. Tannins, as a part of the phenolic compounds, are oligomeric and havemultiple structural units with free phenolic groups and their molecular weight ranges from 500 to 3000D.The fruit pulp and dried pericarp of the

seeds contain the highest amount of tannins. Tannins consist of hydrolysable and nonhydrolysable tannins and hydrolysable tannins (i.e., gallotannins and ellagitannins) are

the main compounds in T. chebula. Gallotannins and ellagitannins are polymers found in the fruits of T. chebula. Gallotannins contain gallic acid that has esterified and bonded with the hydroxyl group of a polyol carbohydrate such as

glucose. Ellagitannins are formed when oxidative linkage occurs in the galloyl groups in 1,2,3,4,6-pentagalloyl glucose. Ellagitannins differ from gallotannins in that their galloyl groups are linked through C–C bonds, whereas the galloyl groups in gallotannins are linked by depside bonds. Chebulagic acid, a benzopyran tannin, is widely distributed in several plant families: the Combretaceae Euphorbiaceae, Leguminosae, Anacardiaceae, and Fabaceae. Also, in the Combretaceae Family, chebulagic acid is
the main constitute of the fruits T. bellerica, T. chebula, and
Emblica officinalis. Chebulinic acid, also known as 1,3,6-tri-O-galloyl-2,4-chebuloyl-β-D-glucopyranoside, is an ellagitannin found in the fruits of T. chebula or in the leaves of T. macroptera [2].

Ethnobotanical uses

The fruit is mild laxative, stomachic, tonic, alterative, antispasmodic. It is useful in opthalmia, hemorrhoids, dental caries, bleeding gums, ulcered oral cavity. Its paste withwater is found to be anti-inflammatory, analgesic and havingpurifying and healing capacity for wounds. Its decoction is used as gargle in oral ulcers, sore throat. Its powder is a good astringent dentifrice in loose gums, bleeding and ulceration in gums. It is good to increase appetite, digestive aid, liver
stimulant, stomachic, gastrointestinal prokinetic agent, and mild laxative. The powder of T. chebula fruits has been usedin chronic diarrhea. It is used in nervous weakness, nervous
irritability. It promotes the receiving power of five senses. It is adjuvant in hemorrhages due to its astringent nature and good for chronic cough, chorizo, sore throat as well as asthma. Also it is useful in renal calculi, dysurea, retention of urine and skin disorders with discharges like allergies, urticaria and other erythematous disorders[3].

Analytical studies related to Terminalia Chebula

Several analytical studies have been reported the methods of detection and isolation of markers of TC. A high performance liquid chromatography method coupled with diode array

detection was developed by Anil Mahajan et al. to determine simultaneously seven different marker from Terminalia chebula with excellent resolution, precision and recovery. These markers are gallic acid, methyl gallate, ethyl gallate, ellagic acid, chebulagic acid , chebulinic acid, penta-O galloyl-β-Dglucose. Another studies have reported isolation of fourteen hydrolyzable tannins from TC . Further Lih-Jeng Juang, Shuenn-Jyi Sheu et al. by optimizing the pH values, buffer composition and buffer concentration of the eluent or carrier, the tannins andrelated compounds successfully determined from T.chebula by HPLC within 80 min and by MEKC within 40 min. Isolation of 2,4-chebulyl-β-D-glucopyranose a new natural product having anticancer activity by chromatographic fractionation of the extract of TC has been reported Besides a new triterpene, 2α-hydroxymicromeric acid and two known compounds, maslinic acid and 2α-hydroxyursolic acid have been isolated from *Terminalia chebula* leaves[4].

Experimental activity:

Antioxidant activity

TC is a potent and cheap natural source of antioxidant. Many reports have confirmed the antioxidant activity of TC which have been complied as follows.In an experimental study 6 extracts and 4 pure compounds of *T. chebula* demonstrated antioxidant activity at different magnitudes of potency. The antioxidant activity of them was noted from different pathways and was suggested to be specific in some term. In another experiment *t*-BHP was employed to induce acute oxidative stress in rat hepatocytes & in Vitro. Two distinctive pathways are involved in the metabolism of *t*-BHP in hepatocytes. The first employs the initiation of lipid peroxidation while the second results in NADPH oxidation. The *in vitro* experiment showed that TC extract could quench DPPH free radicals and reflected in increased cell viability in rat hepatocytes exhibiting antioxidative property. The significant effectiveness of pretreatment and subsequent removal of the TC extract prior to *t*-BHP treatment indicated that TC exerted its protective activity intracellularly, rather than

extracellularly by reacting with *t*-BHP in the culture medium. Further the phenolics of TC prevent nickel chloride-induced oxidative stress by decreasing LPO restoring the activity of glutathione-S-transferase glutathione reductase, and glutathione peroxidase [5] .

CONCLUSION

From the survey it was found that, *Terminalia Chebula* has a strong effect against the wound healing, has antibacterial activity, and exhibits strong cardio protective. *Terminalia Chebula* also has antioxidant components, which indicates it can increase the life of tissues. Further few studies shows the anti-tumor activity of *Terminalia Chebula* and another study shows that it has considerable effect in inhibiting the HIV virus which ultimately results in AIDS. There is a substantial evidences found that, it can be used as Gastrointestinal motility agent, Anti-aging

substance. It also posses properties like Antilithiatic activity, Hypolipidemic activity, Radio protecting Ability, Antifungal activity and etc. The chemical constituents of *Terminalia Chebula* like chebulinic acid, Tannin, Galic acid and ascorbic acids are the key factor for the efficient action of the species. However, there are some problems apparently associated with the uncontrolled use of "natural" products and traditional herbal medicines13. It needs to be

mentioned here that most serious side effects originates from overuse or misuse of such medicines. To know further about a biological and pharmacological action of different part of *Terminalia Chebula*, it is advised to refer the individual research article. We hope the article will be of immense use to the researchers and students who working on medicinal properties of *Terminalia Chebula* and result in increased interest in this medicinal herb.

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