

## Potential therapeutic applications for Terminalia chebula in Iranian traditional medicine

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### Abstract

*Terminalia chebula* (family: Combretaceae) is widely used in the traditional medicine of India and Iran to treat diseases that include dementia, constipation, and diabetes. This tree is known in Iranian traditional medicine (ITM) as halileh or halilaj and the fruit is used to develop treatments. It is described in ITM as an astringent that has a "cold" and "dry" temperament. References to the medicinal properties of *Terminalia chebula* were collected from important ITM sources and from modern medical databases (PubMed, Scirus, ScienceDirect, and Scopus). The medicinal properties described for this

tree in ITM were compared with those reported in studies of modern phytotherapy. The results confirm that the tree referred to as halileh in traditional books is the *Terminalia chebula* used in present-day studies. Treatments that have not been evaluated in modern phytotherapy but have been traditionally treated with *Terminalia chebula* include fever, and psychological and psychiatric issues. This article confirms the medicinal uses of *Terminalia chebula*.

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**Key words:** Fructus chebula; Phytochemicals; Pharmacology; Iranian traditional medicine

### INTRODUCTION

*Terminalia chebula* (myrobalan) is a commonly consumed herb used in Indian traditional medicine that has been adopted for use in Iranian traditional medicine (ITM). Traditional Iranian physicians have used the herb to treat many diseases. Myrobalan is referred to as halileh in ITM textbooks in Farsi, ah-halilaj in Arabic, and harharu in Hindi.<sup>1,2</sup>

Myrobalan has a well-documented history of use in traditional medicines to treat disease. ITM bases the use of medications on the temperament of the substance. These temperaments cannot be defined using laboratory criteria, so myrobalan was assessed according to modern scientific standards to allow comparison of traditional and modern scientific findings.

In both ITM and modern phytotherapy, the main medicinal part of myrobalan is the fruit. The pharmacologically active compounds of myrobalan are total phenols (tannins). ITM states that all things are composed of four elements and the differences between objects can be attributed to the ratios of these four elements in each object. Thus, every object has a specific quality

based on its dominant element (s). This specific quality is known as temperament (midzaj).<sup>3,5</sup> Belief in the temperament of objects is common to many types of traditional medicine, including Greek, Arabic, Roman, Indian, European, and Traditional Chinese Medicine.<sup>6</sup> Plants are also thought to be composed of the four elements and adhere to specific rules.

Myrobalan is believed to have a cold and dry nature in ITM. The present study reviewed and compared the pharmacological uses of myrobalan in ITM and modern phytotherapy. ITM and modern phytotherapy recommendations about the safety and acceptable dosages for the medicines made from this plant are discussed.

## METHODS AND MATERIALS

Major ancient sources of information about ITM were consulted. The following sources were searched for information about halileh for the treatment of disease: the Avicenna's Canon, Al-Igraz, At-Tibbieh, Al-Mabalahis, Al-Alaieh, Axirazam, Sharhe-Asbab, Akbari medicine, and Kholasat-Al-Hekmaa. The habitat, appearance, and properties of this herb as described in ITM were recorded.

The following modern botanical sources and databases were searched for the key words "Terminalia chebula" and myrobalan: ScienceDirect, Google Scholar, Iranmedex, PubMed, Scirus, and Scopus. These key words were combined with the terms "phytochemistry" and "pharmacology" to search for phytochemical and pharmacological properties of myrobalan. The articles were selected based on academic and scientific journal. The results were compared with the findings from ITM sources. This method of data collection was used to control for possible publication bias.

## RESULTS

### *Shape and structure*

*Terminalia chebula* is a traditional plant belonging to the genus *Terminalia*, family *Combretaceae*. It is native to India and Southeast Asia and is commonly known as myrobalan in English.<sup>7-9</sup> It is extensively cultivated in Taiwan and India.<sup>8,10</sup> The fruit of the tree is the most important part. If unripe fruit is picked from the tree and dried, it becomes black in color and is then called black myrobalan. The fruit is yellow when it is fully ripe. When the yellow fruit has dried, it becomes very hard and is known as yellow myrobalan. The tannin content of the fruit increases as it ripens.<sup>9</sup> The best myrobalan fruit for use in ITM is stiff, heavy, free from decay, and sinks in water.<sup>4,11</sup>

### *ITM and myrobalan*

ITM physicians believe that the fruit of the myrobalan tree has a water component that is called an extract and an earth component that is called scum. Addition-

ally, it contains moisture (rotoobat fazliyye) that is resinous. The earthy components comprise two parts: cool components, and burnt and hot components. Cool components are acrid and astringent. Burnt and hot components are bitter and tender. Moisture can contain air components that make the fruit oily in appearance. The interaction of these basic components forms the temperament of myrobalan, which is cold and dry.<sup>11</sup>

### *Phytochemistry of myrobalan*

Steroids/sapogenins, saponins, anthraquinone derivatives, flavonoids, and tannins were detected in the fruit of myrobalan.<sup>8</sup> The most important component in the fruit is tannin. *Terminalia chebula* has a tannin content of 32%–45% that includes gallic acid, ellagic acid, chebulic acid, chebulinic acid, punicalagin, and tannic acid. The flavonoids quercetin, catechin, and kaempferol have been detected. Monosaccharides/oligosaccharides (9%) detected are D-glucose, D-fructose, and saccharose. The fruit acids include quinic acid (1.5%), shikimic acid (2%), and fatty oil (from seeds; 40%). The high tannin content of myrobalan makes it popular for use as an astringent.<sup>8,12,13</sup>

### *Psychological and psychiatric uses*

ITM sources report that myrobalan strengthens memory retention and brain activity. It is reported useful for confusion, headache, melancholy, depression, obsession, amnesia, facial paralysis, misanthropy, dizziness, and insomnia. Traditional texts report that it helps to prevent stomach vapors from ascending into the brain and evacuates phlegmatic excreta from the brain.<sup>1,3,4</sup>

### *Ophthalmic effects*

Myrobalan aids visual acuity and drainage from the eyes;<sup>4</sup> it is an eye tonic, a desiccant of moisture in the eye, and is useful for epiphoria and eye irritation when soaked in rosewater.<sup>11,14</sup>

### *Cardiopulmonary effects*

Myrobalan refreshes the heart and is useful in treating palpitations and tachycardia.<sup>11</sup>

### *Gastrointestinal effects*

A myrobalan tonic for the stomach controls vomiting and diarrhea (roasted), absorbs stomach moisture, and increases stomach retention and appetite. It is a digestive, laxative (soaked), and decreases hemorrhoidal bleeding (burnt powder).<sup>1-4,11,14</sup>

### *Hepatic, splenic, and urinary effects*

A liver tonic (jam) of myrobalan moderates liver temperament and is used to treat generalized dropsy and spleen pain, as a diuretic, and for treatment of polyus.<sup>1,3,11</sup>

### *Dermatologic effects*

Myrobalan improves paleness, decreases greying of the hair, and is a hair tonic (when sucked). It is also effective in the treatment of leprosy.<sup>1-3,11,14</sup>

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