



## Oak (*Quercus branti*): An overview

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### ABSTRACT

*Quercus brantii*, the Persian oak, is a species of oak native to Western Asia, including Iran, Iraq, Syria, and Turkey. Various branches of the oak have huge health benefits. In Iranian Traditional Medicine from oak have been used for angina throat, tonsillitis and hoarseness, typical blood hemorrhoids, cures diarrhea and dysentery, relieves stomach pain and its gas, alleviates anemia and cures rickets, strengthen the stomach and respiratory system, softens the breasts and smooth sound and relieve coughs, etc. So it can be used as a valuable nutritional and pharmaceutical plant for producing of drugs in treatment of so many disorders and diseases.

**Keywords:** Oak, *Quercus brantii*, Medicinal plants, Iran

### INTRODUCTION

*Quercus brantii*, the Persian oak, is a species of oak native to Western Asia, including Iran, Iraq, Syria, and Turkey. *Quercus brantii* (covering more than 50% of the Zagros forest area in Iran) is the most important tree species of the Zagros in Iran. Oak (Scientific name: *Quercus branti*) is the name of trees and their fruits. Oak trees has long life and its many species are native of Alborz and Zagros. Oak classification is according to Table 1<sup>[1]</sup>.

#### Scientific classification of *Quercus brantii*

Oak is considered most abundant species tree in the West Countries, as well as in the Zagros region. Zagros mountain is the largest and most species of oak habitant in Iran and that's why this region is important. Iranian oaks are large trees as tall as 20 meters with a large spherical crown and from the Fagaceae family in table 1<sup>[2]</sup>.

Table :1. Oak classification

Scientific classification	
Kingdom	Plantae
(unranked)	Angiosperms
(unranked)	Eudicots
(unranked)	Rosids
Order	Fagales
Family	Fagaceae
Genus	<i>Quercus</i>
Section	<i>Cerris</i>
Species	<i>Quercus brantii</i>

**Morphology of *Quercus brantii* plant**

The leaves are generally smooth and oval with toothed margins covered with the star-shaped furs and soft yellow fur on its back. The fruit is elongated, semi-elliptical and is in conical cup white velvet <sup>[3]</sup> (Picture 1). Its fruit is called Gland that is placed in Acron cup. Oak tree has various amounts of oil, sugars, starch, and small amount of quercetin, pentosan and tannin. Tannins with astringent and antiseptic effects are the mainly compounds of Iranian oak.



Figure: 1. Oak tree fruit

**Therapeutic effects of *Quercus brantii***

Various branches of the oak have huge health benefits. There are high levels of tannin in the oak trees and have various properties such as albumen precipitating, and textures to create covers to prevent infection. Effect of tannin in tuberculosis treatment and wound healing is with microbes entrance prevention. Tannins inhibit mucosal hyper secretion. Pectin is another substance that acts contraction like tannins. Pectin is hemo glycosides transformed to pectic acid under pectase command. This material has astringent properties and the reason is that the with consumption blood clotting increases. Various members of oak because of having tannins have astringent effect. Oak leaves have poor stimulant and astringent effects and are used in the treatment of tonsillitis and throat infections. Oak bark due to high tannin is less used in domestics <sup>[4-6]</sup>. Consumption for a long time causes fatigue and pain in the stomach and the heart muscle. In addition to stimulating the digestive tract, it also causes other symptoms such as stomach pain and jerky. Oak bark is a good antidote to poisoning caused by metals. Oak skin therapeutic value in external use is more than its domestic consumption. Oak bark tea is recommended for topical baths, lotion and wash in different ways to treat diseases. That tea can be used as local baths for conditions such as cancer ulcers, gland inflammation due to obstruction of the ducts, hematomas melancholy, chronic skin diseases such as eczema and varicose veins. In cases of nose bleeds can act in this way: 15 grams oak bark and 2 grams of alum are dissolved in 1.5 liter water and then its volume is reduced to one liter by boiling, with cotton soaked in above tea the nasal cavities are washed. With this action blood is readily cord. The mixture of oak flour fruit with wheat flour is used to produce bread in some areas. Fruit of the oak tree has many therapeutic uses. If sliced oak fruit and mixed in a cup of water and use it, bloating will be relieved. In the past roast the fruit tannins were reduced by this action, then it used in the preparation in a kind of coffee. This coffee that contains dextrin was used to treat diarrhea and internal enzymes, indigestion, stomach pain, anemia, rickets, tuberculosis, and tuberculosis in the early stages and asthenia. Roasted acorns flour, mixture with cocoa, is the best medicine to relieve simple diarrhea in children. Appendages on the leaves or buds of oak types have a lot of tannin. Gall is used as a stomach tonic, astringent, and bleeding stopper. Consumption dosage of powder is 0.5-1 gram, several times in a day, in mixed with honey. Acorn fruit contains 5% protein, 7% fat, 70-80% hydrocarbon and comes from Oak taps that in the local word in Ilam is called "shock" and is used as a jam for breakfast. Shock is useful for stomach problems; stew 28 g of oak leaves in 0.5 liters of water and consume a teaspoonful to a small cup of it every hour for the treatment of the common cough and convulsions. Oak bark is peeled hard. To peel the bark, divide skin with a knife at first, then put it in boiling water and remove it after a few minutes. This tea can be used for the treatment of various diseases and disorders such as angina throat, tonsillitis and hoarseness. Initially, grind 50-60 gr of the bark of young branches of oak which have dried and stew in 1 lit cool water or 12 minutes then dry it and taste in the mouth 3 times a day and then throw it. This tea is very useful to treat pharyngitis, impetigo and eczema. Boiling the oak bark in steel containers causes iron to rust due to the tannins in it. Oak bark, treat hemorrhoids and ulcers that are caused by frost

and sweat<sup>[4-6]</sup>. The use of natural substances as additive can lead better and healthier effects in the body. Oak is hot and dry in traditional Persian medicine. Oak relieves typical blood hemorrhoids, cures diarrhea and dysentery, relieves stomach pain and its gas, alleviates anemia and cures rickets. It is able to strengthen the public body, eliminate vaginal secretions and eczema and treat bruises. For the treatment of skin diseases in the bathtub where you poured boiling oak bark rest for 15minutes. If you have varicose, compress there with an oak bark tea. Oak stops bleeding strengthen the stomach and respiratory system, softens the breasts and smooth sound and relieve coughs. It cures shortness of breath. Also it is used as an analgesic and sedative. It is anti-virus and fungicide, anti-fever, and is used in the treatment of rheumatism and gout<sup>[7-9]</sup>. Other uses of oak include usage of seeds, leaves and galls in the pharmaceutical, dyeing and leather industry. Oak wood is strong and is used to build devices or burning. Some oak species are planted as ornamental trees and the leaves of some species are pests in gardens and greenhouses<sup>[10]</sup>. The fruits of this tree are composed mainly from starch and vitamins such as A, B, C, protein, fiber and minerals. In addition to food consumption, it has usage in traditional medicine<sup>[11]</sup>.

### Bioactive components

Acorn fruit contains amounts of biologically active compounds such gallic acid (figure 2), ellagic acid (figure 2), malic acid (figure 3), gallvil derivatives, Hexa-hydroxy diphenyl, malic acid (figure 4), tannic acid (figure 5), quercin (figure 6), mucilage and pectin<sup>[12-14]</sup> that all of these compounds have antioxidant effects.

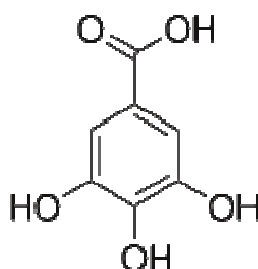


Figure: 2. Gallic acid

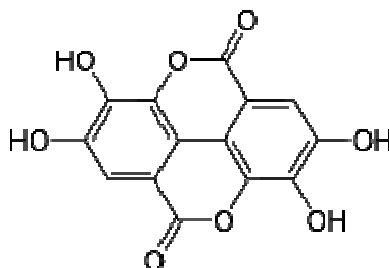


Figure: 3. Ellagic acid

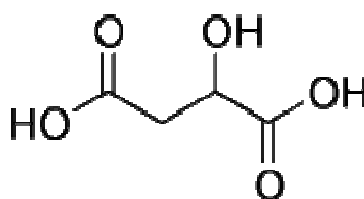


Figure: 4. Malic acid

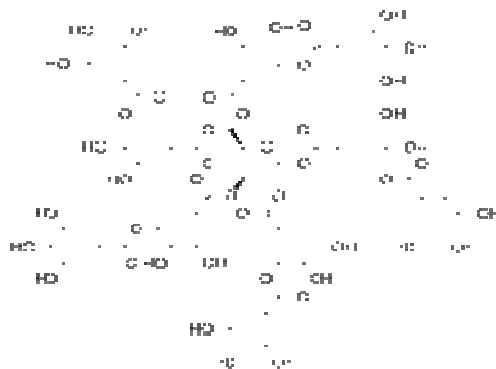


Figure: 5. The tannic acid (a type of tannin)

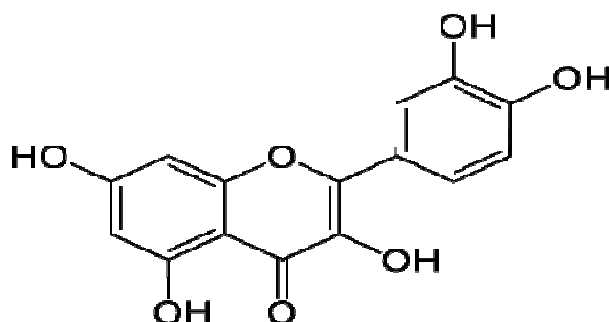


Figure: 6. Quercin

Oak has a wonderful anti-inflammatory properties due to flavonoid compounds and show this effect on the intestinal mucosa and skin. Acorns brain and skin cure IBS syndrome. Herbal medicines produced by a variety of oaks, including vinagol ointments, Coated tablets of veinovital, tablet of phytovan, tablet vanogl are examples of drugs produced with oak. In addition, this plant has taken tissue excess mucus and at the same time reduces the susceptibility and irritability. Water placental lining the stomach and intestine that causes diarrhea and can be slippery, slip off, and it would free the slippery. It seems that oak active ingredients and antioxidants are main factors for therapeutic effects. Extraction of the active ingredients and pharmacological and clinical trials are needed to confirm the noted therapeutic effects and to produce effective drugs against various diseases. As it was mentioned oat has antioxidant activity and herbal antioxidants and bioactive materials with antioxidant activity can scavenge free radicals, inhibiting diseases induced by these highly reactive materials. Free radicals have been shown to induce or exacerbate a wide variety of complications such as pain<sup>[15] [16]</sup>, infection<sup>[17] [18]</sup>, cognition deficit<sup>[19] [20]</sup>, and atherosclerosis<sup>[21] [22]</sup>. They also can cause renal<sup>[23] [24]</sup> and liver<sup>[25]</sup> toxicity.

Antioxidants are useful for health and consumption of these antioxidants counteracts and reduces the risk of free radical induced diseases such as diabetes<sup>[26] [27]</sup>, various infections<sup>[28-38]</sup>, gastrointestinal disorders<sup>[39-41]</sup>, cancer<sup>[42] [43]</sup>, skin disorders and injury<sup>[44] [45]</sup>, psychiatric and neurological disorders<sup>[46-49]</sup>, hyperlipidemia<sup>[50] [51]</sup> and respiratory<sup>[52]</sup>. Medicinal plants with antioxidant activity have also the capacities to diminish drug induced adverse effects<sup>[53] [54]</sup> and even heavy metal or other toxicities<sup>[55]</sup>. Although there are various compounds with different actions in the plant, however, this plant possesses high level of antioxidants which it is effective on disorders and diseases. Therefore, oats which have antioxidant activity, other than the above mentioned properties, may be useful in treating these diseases, too.

From the literature survey it is evident that *Q. brantii* has been exhaustively worked out for both chemical and pharmacological studies. In all the reported pharmacological activities, it is found to be more potent. It finds a broad spectrum of therapeutic usage. As the plant is widely distributed, it could be considered for new drug formulations.

## CONCLUSION

In summary, the plants of this genus possess anticancer, antioxidant, Anti-ulcer, cancer, gland inflammation due to obstruction of the ducts, hematomas melancholy, chronic skin diseases such as eczema and varicose veins, hemorrhoids, inflammation and to treat indigestion, stomach pain, anemia, rickets, pertussis and treatment a lot of disorders used for so many medicinal purposes by the local peoples. The main aim of this review was to establish permanent genus literature in plant resource information to facilitate future studies and human interventions in the world.

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