

WHITE TEA AND HEALTH

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Abstract

White tea, which is produced from the immature leaves and buds of the *Camellia sinensis* L. plant, is produced and sold in the market in five different qualities (Silver needle, White peony, tribute eyebrow, noble, long-lasting eyebrow and puerperal tea) depending on different picking times and standards in China. White tea is known to have a higher concentration of catechins than green, black and oolong tea. White tea provides effective protection against many different types of cancer (such as colon, prostate and stomach cancer). White tea has a protective effect against stroke damage by helping the development of blood vessels. Catechins in white tea have been found to lower LDL cholesterol. In this review, white tea and its effects on health are reviewed.

Keywords: Catechin, Health, White Tea

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BEYAZ ÇAY VE SAĞLIK

Özet

Camellia sinensis L. bitkisinin olgunlaşmamış yaprak ve tomurcuklarından üretilen beyaz çay, Çin'de farklı toplama zamanları ve standartlarına bağlı olarak beş farklı kalitede (Silver needle, White peony, tribute eyebrow, noble, long-lasting eyebrow and puerperal tea) üretilmekte ve piyasada satılmaktadır. Beyaz çayın yeşil, siyah ve oolong çayına göre daha yüksek kateşin konsantrasyonuna sahip olduğu bilinmektedir. Beyaz çay birçok farklı kanser türüne (kolon, prostat ve mide kanseri gibi) karşı etkili koruma sağlamaktadır. Beyaz çay, kan damarlarının gelişimine yardımcı olarak felç hasarına karşı koruyucu bir etkiye sahiptir. Beyaz çayda bulunan kateşinlerin LDL kolesterolü düşürdüğü tespit edilmiştir. Bu derlemede beyaz çayın sağlık üzerindeki etkileri gözden geçirilmiştir.

1. INTRODUCTION

The homeland of tea is China and it has spread all over the world from there. The first attempt for tea production in Turkey was made in 1888; tea seedlings and seeds brought from China were tried in Bursa, but tea seedlings did not show any suitable growth. Planting of tea seedlings and seeds was repeated in 1892 again, but it also failed due to the lack of humid and rainy climate in Bursa and the ecological conditions which were unsuitable for tea cultivation. In 1917, the authorities of the period prepared a report stating that the Eastern Black Sea Region had similar ecological conditions to the regions where tea and citrus plants were grown. In 1924, studies on planting tea seedlings and seeds were carried out in the Eastern Black Sea Region, especially in Rize, and today, this region meets Turkey's tea needs and produce at a scale that is abundant to export (Füsunoğlu and Besler, 2008). Tea, which is a tropical plant of Asia, is one of the widely consumed beverages in the world, and also known to have medicinal properties; It is an evergreen perennial herb belonging to the *Camellia* genus (*Camellia sinensis*, L (O) Kuntze) of the Theaceae family (Türkmen, 2007). *Camellia sinensis* variety *sinensis* which is indigenous to China is of medium quality and cold resistant, while *Camellia sinensis* variety *assamica* is of high quality but is prone to cold injuries (de Mejia et al, 2009). Tea is a popular beverage rich in polysaccharides, caffeine, polyphenols, amino acids and antioxidants, which are said to be beneficial for health, consumed by people around the world (Gramza Michałowska et al., 2016; Yang and Landau, 2000). Tea (white, green, oolong and black tea) obtained from the leaves and buds of the plant *Camellia sinensis* L. is one of the most widely consumed types of tea. It is also categorized according to differences in harvesting, processing and degree of oxidation of polyphenols in fresh tea leaves (Obanda et al., 2004, Yılmaz and Acar, 2023). Tea polyphenols have been suggested to contain bioactive compounds, antioxidant and anti-inflammatory properties that play an important role in delaying the development of diseases such as cancer and diabetes (Yang et al., 2008; Lampe, 2003). Polyphenols found in tea are flavanols and flavan-3-ols (McKay and Blumberg, 2002). It is suggested that tea accelerates metabolism and encourages the burning of excess fat in the body, but it would be better to get rid of these excesses with a balanced diet and regular exercise. In addition to these, it may be appropriate to include white tea in weight loss program.

Tea varieties are reported to have harmful toxic effects as well as beneficial effects on human health. The toxic effect of tea may be related to prooxidants and antioxidants. In other words, it is reported that oxidizing chemicals in tea can cause damage and cause reactive oxygen species. There is a balance between the prooxidant and antioxidant effects of flavonoids in tea. With high tea consumption, an imbalance in the

prooxidant and antioxidant properties of flavonoids in tea occurs, leading to toxicity (**Figure 1**) (Perez-Llamas et al., 2011)

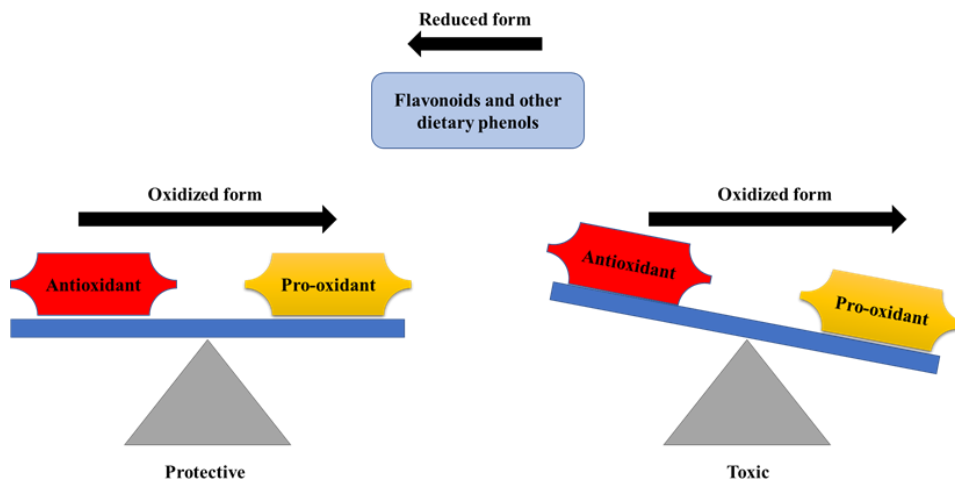


Figure 1: Protective and toxic effects of flavonoids in tea

2. HISTORY OF WHITE TEA AND PRODUCTION TECHNOLOGY

The history of white tea dates back to 600 AD. Emperor Hui Zhong of the Song Dynasty, who was on the throne in China at that time, took action for the development of white tea, which he declared as the pinnacle of elegance. White tea has been a secret for countries outside of China for centuries. In white tea, the perfection in the appearance of dry tea continues in the brew, and the taste and aroma reach perfection in brewing. During these periods in tea history, the type of beverage and the way it was prepared were quite different from what we are used to today. Tea leaves were pressed into a cake shape, and pressed tea pieces were boiled in earthen teapots and brewed. The raw material of this particular Tang white tea was harvested in early spring when the tea shoots were just starting to grow and the silver needle-like buds were abundant. In the production of pressed white tea, the raw material of the first shoot was definitely used. White tea, like other teas, is produced from suitable varieties of the tea plant (*Camelia sinensis*). White tea is the rarest and most expensive tea in the world. In the world, white tea is produced mainly in China, India, Kenya, Sri Lanka and Vietnam and the total production amount is estimated to be 600-800 tons (Cooper, 2006). White tea, the production of which requires great care and effort, is produced from newly formed and unopened leaf buds covered with fine white fur, collected in early spring from special tea plant varieties selected in the Fūjian region of China. White tea value increases and gains importance due to the fact that the raw material used in production can be collected in very short periods during the year. In white tea; unlike green tea, black tea and oolong tea, no curling process is applied. Very young shoots containing a high percentage of unopened buds are shocked by applying hot water vapor or heat immediately after collection. After cooling, withering is done. Following a very light oxidation, white tea production is realized by drying (**Figure 2**) (Kacar, 2010).

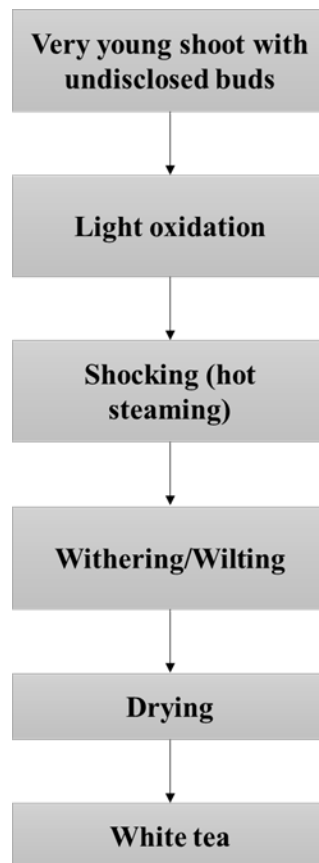


Figure 2: White tea production process

White tea is a very light yellow colored brew consisting of silky white hairs covering the immature leaves and buds of the tea plant. Due to its flavor, white tea has become an increasingly popular beverage and there are many varieties on the market. Among these teas, Silver Needle and White Peony are the main types. However, there are several other classes with different trade names (Ho et al., 2008; Hilal and Engelhardt, 2007).

White teas produced in China are produced and sold on the market in five different qualities depending on the material used in production, different picking times and standards. These are:

- 1. Silver Needle:** It is the highest quality white tea and is produced from unopened and undamaged buds covered with fine white hairs collected between March 15 and April 10 in the Fujien region of China. There are no leaves and stems in the material. The white tea produced has a uniform appearance and bright color.
- 2. White Peony:** It is a second class white tea produced from young shoots containing a bud covered with fine silvery white hairs and leaves collected from the Fujien region of China.
- 3. Tribute Eyebrow:** Third grade white tea produced from young shoots with small leaves.
- 4. Noble, Long Life Eyebrow:** It is a fourth grade white tea produced from the top and tip leaves of the tea plant and has a stronger flavor similar to Oolong tea compared to other white teas.
- 5. Puerth Tea:** It is a white tea with a white appearance, abundant flavor, sweet nectar, which is a labor-intensive, white-looking, abundant flavor, sweet nectar, which is made by hand at every stage, from the young shoots collected in the spring from the tea plantations on the hills of the mountains in the Yunnan region of China (Anonymus 2009). White tea is also produced and marketed in various different countries. For example, Ceylon white tea is produced in Sri Lanka, Darjeeling white tea is produced in Assam in the

north of India and African white tea is produced in Malawi and Kenya. As mentioned before, white tea is much higher quality and expensive than other teas (Kacar, 2010).

3. BENEFITS OF WHITE TEA FOR HUMAN HEALTH

The health benefits of white tea are shown in **Figure 3**.

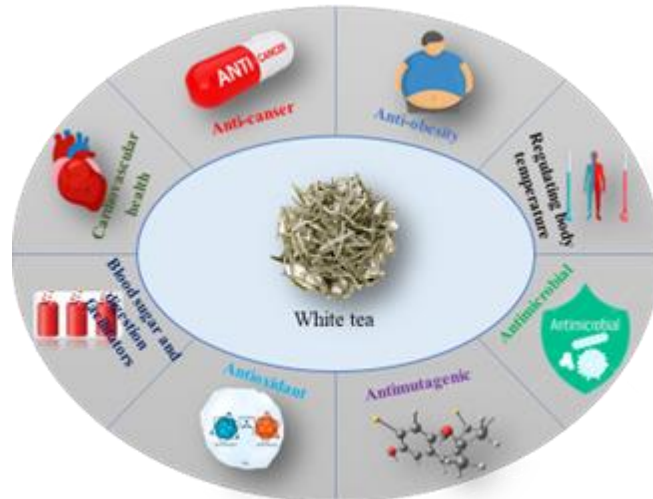


Figure 3: Health benefits of white tea

Many clinical experiments conducted in the world have listed the benefits of white tea, which contains high amounts of catechins, especially EGCG, to human health due to this component and other important tea components as follows: White tea also contains flavonoids that inhibit the growth of cancer cells and the formation of new ones. Catechins found in white tea have been found to lower cholesterol. White tea is known to lower bad cholesterol and increase good cholesterol in the body. This can help prevent arteriosclerosis and vessel blockage. It helps protect against colds and flu and can relieve symptoms of human immunodeficiency virus (HIV). Studies have found that people who drink 2 cups or more of tea a day are 50% less likely to die from a heart attack than those who do not. White tea also has very beneficial effects for people suffering from rheumatism and osteoporosis. White tea is said to contain fluoride, which kills bacteria that cause tooth decay and mouth odor. White tea is known to destroy free radicals and protect the skin. White tea lowers blood sugar, relieves symptoms of diabetes, reduces stress and provides energy. So far, it has been stated that white tea has a wide variety of effects on the body and has many benefits for our health (Rusak et al., 2008; Venditti et al., 2010; Kanwar et al., 2012; Kouhihabibidehkordi et al., 2021; Yilmaz and Acar, 2023).

4. CONCLUSION

White tea, which is obtained from the buds of the tea plant, is especially rich in bioactive compounds compared to other tea varieties. Thanks to the catechins it contains, many positive effects on health have been demonstrated. White tea is a very expensive drink compared to other tea varieties. As it is known, it is thought that it is important for Turkish tea production to prioritize activities such as diversifying tea products, developing high value-added products, increasing tea product alternatives that can be offered to consumers, developing our own unique white tea varieties and their production methods, conducting integrated research on these issues and supporting such research, promoting white tea, promotional activities to increase consumption.

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