

## The Origin and Distribution of Tea Trees and Tea in China

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Journal of Tea Science Research, 2023, Vol.13, No.2 doi: [10.5376/jtsr.2023.13.0002](https://doi.org/10.5376/jtsr.2023.13.0002)

Received: 18 Jul., 2023

Accepted: 01 Aug., 2023

Published: 15 Aug., 2023

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**Preferred citation for this article:**

Liu C.C., 2023, The origin and distribution of tea trees and tea in China, Journal of Tea Science Research, 13(2): 1-8 (doi: [10.5376/jtsr.2023.13.0002](https://doi.org/10.5376/jtsr.2023.13.0002))

**Abstract** Tea (*Camellia sinensis*) originated from wild tea trees in the mountains of southern China, and after thousands of years of domestication and cultivation, China has developed major tea-producing regions with abundant tea resources and numerous excellent tea varieties. Tea not only holds an important position in China's history and culture, but it is also one of China's important economic crops. Since ancient times, Chinese people have loved drinking tea. The cultivation, production, and art of tea drinking, as well as tea culture, have had a profound impact on people's way of life, thinking, and social communication. This review explores the history of tea and its significant impact on Chinese culture, as well as the origin and domestication process of tea trees. It analyzes the main distribution regions and characteristics of tea trees in China, and summarizes recent research progress on the origin and distribution of Chinese tea trees and tea. The review provides a reference for further research on the quality of Chinese tea and the preservation of tea tree germplasm resources.

**Keywords** Chinese tea tree (*Camellia sinensis*); Tea; Tea culture; Origin; Distribution

Tea (*Camellia sinensis*) is an important component of traditional culture and economy in China, and is also one of the most popular beverages in the world. China is the homeland of tea, and the history of tea in China can be traced back to 2 737 BC. Legend has it that the ancient Chinese emperor Shennong discovered the aroma and taste of tea and began to drink its infusion, marking the beginning of the history of Chinese tea. Since ancient times, tea has been regarded as a healthy beverage and widely used in medicine, diet, and rituals. Over time, Chinese tea culture has gradually formed and become an important part of Chinese culture, known as the "Representative of Tea Culture in the World."

In addition to its cultural value, tea also plays an important role in China's economy. China is the largest producer and consumer of tea in the world, and the tea industry is one of China's traditional industries and an important part of Chinese agriculture. Chinese tea exports and quality are also renowned worldwide, becoming an important pillar of China's foreign economic and trade (Pan et al., 2023; Tao, 2023).

Therefore, studying the origin and distribution of Chinese tea trees and tea is particularly important. Research on the origin and distribution of Chinese tea trees and tea has important implications for the sustainable development of tea production and consumption, the inheritance and development of tea culture, and the protection and utilization of tea germplasm resources (Chen et al., 2004). This review will explore the origin and distribution of Chinese tea trees and tea, analyze their economic and cultural values, and the current situation of germplasm resource protection, aiming to provide a reference for the sustainable development and cultural inheritance of Chinese tea.

### 1 The Origin of Chinese Tea Trees and Tea

#### 1.1 The origin and distribution of tea trees

Tea tree (*Camellia sinensis*) is an evergreen tree or shrub, often in the form of bushes, with dense leaves and white flowers. It belongs to the genus of *Camelia* in the family of Theaceae, which is the only source of tea.

Tea trees are distributed all over the world. There are many academic views on the origin of tea trees, but mainly the following two: One view believes that tea trees originated in southern Yunnan and southwestern Yunnan in China. This view is supported by ancient literature and archaeological evidence. According to historical records such as *Chá Jīng (The Classic of Tea)*, the ancient Chinese had the habit of picking and drinking tea leaves. Archaeologists have also found tea-related artifacts and fossils in some sites in Yunnan, such as tea leaf fragments, teapots and tea sets. Another view holds that tea trees originated in the Asian mountains of India. This view is mainly based on the results of molecular biology and biogeography research. Recent studies have shown that the closest wild relatives of tea trees are mainly distributed in India, Myanmar, Laos and other places, while relatively few in China. In addition, the wild species of tea trees are morphologically more similar to the species in the Indian Asian mountains.

However, it is widely believed that the tea tree originated in Yunnan province, located in the southwestern part of China. Yunnan is the center of the original origin of the tea tree and the distribution center of species diversity, tea tree resources are exceptionally rich (Sun et al., 2019). In the Xishuangbanna region of Yunnan, wild populations of tea trees can still be found, with some reaching heights of over 20 m. Archaeological research showed that scenes of tea picking were depicted in rock paintings in southern China as early as 5 000 BC. Some historical Chinese documents about tea also provide us with important clues about the origin and history of Chinese tea.

## 1.2 Domestication of tea trees

The evolution of tea trees is extremely complex. According to existing research, tea trees may have evolved from a wild *Camellia oleifera*. In the long process of natural evolution, tea trees gradually formed varieties with unique characteristics, such as *Camellia sinensis* var. *Sinensis*, *Camellia sinensis* var. *Assamica*, and (*Camellia sinensis* var. *Cambodiensis*). Among them, *Camellia sinensis* var. *Sinensis* are the main varieties of Chinese tea trees and one of the best varieties in terms of tea production and quality. They are mainly produced in China, India, Japan and other places, also known as Chinese tea trees, and are the main raw materials for producing green tea and black tea.

The domestication history of tea trees can be traced back to around 3 000 BC. In the long process of evolution, tea trees continuously adapted to the changes in their environment, eventually forming the characteristics of modern tea trees. In the evolution process of tea trees, the earliest tea trees were wild species, distributed in southern China, India, and Southeast Asia. The leaves of these wild tea trees were relatively small and not very suitable for making tea, but they had strong resistance and adaptability, and could grow in harsh environments such as high altitude, low temperature, and low oxygen (Figure 1).

With the development of human agriculture and tea culture, tea trees began to be domesticated and cultivated by humans. In China, the earliest cultivated tea trees can be traced back to the Shang and Zhou dynasties several thousand years ago, while the earliest tea-making techniques can be traced back to the Han dynasty. During the process of cultivation and domestication, humans gradually bred many varieties and variants of tea trees. These varieties and variants of tea trees exhibit different characteristics in terms of morphology, leaf size, tea quality, and so on, meeting the needs of different regions and populations.

In modern times, as humans continue to pursue the quality and health benefits of tea, tea trees are also constantly evolving and improving. After the reform and opening up, the research on genetic breeding of Chinese tea trees has accelerated, and since the 21<sup>st</sup> century, it has achieved good results in terms of the number and diversity of cultivated varieties, breeding techniques, and basic breeding theories in multiple fields (Wang et al., 2022). Currently, tea breeding and cultivation technologies have been continuously improved and innovated, and the quality and yield of tea have also been continuously improved. At the same time, the wild resources of tea trees

have also been protected and developed, in order to protect the inheritance of tea culture and the sustainable development of tea trees.



Figure 1 Wild tea tree

### 1.3 Origin and development of tea

The origin and development of tea are also very ancient. Tea was first discovered and collected by humans about 4 000 years ago, and was widely used in China during the Shang dynasty. The earliest tea is said to have been made from the tender buds and leaves of tea trees. Over time, people gradually discovered the different ways of making and tasting tea, thus gradually forming various tea varieties and production techniques.

According to the different methods of tea production and fermentation, tea can be divided into six categories: green tea, black tea, oolong tea, dark tea, white tea, and yellow tea (Figure 2). Among them, green tea is one of the earliest tea varieties. Its production process is very simple, and only requires fresh tea leaves to be roasted to make. Black tea is a tea variety that appeared later and requires complex processes such as fermentation. Oolong tea is somewhere in between green tea and black tea in terms of production process, and has a unique taste.



Figure 2: Six major types of Chinese tea

Note: A: Green tea; B: Black tea; C: Oolong tea; D: Dark tea; E: White tea; F: Yellow tea

The Chinese people were the first to discover and utilize tea trees, and the variety of tea types and unique production techniques have made China's tea culture distinctive in the world. The tea cultivation techniques, tea production processes, and tea drinking habits around the world all originated from China.

## 2 Classification and Distribution of Chinese Tea Trees and Tea

China is one of the origins of tea trees, as well as a major producer and consumer of tea, with abundant tea resources and diverse tea tree varieties. According to different classification criteria, Chinese tea trees can be divided into different species and varieties.

### 2.1 Classification and distribution of Chinese tea trees

According to the "Chinese Tea Tree Varieties" record, there are currently about 367 tea tree varieties in China, most of which are shrub-type tea trees, with medium and small leaf types being the main ones. This includes national and provincial tea tree varieties, as well as varieties and strains suitable for making special types of tea. Common varieties include Longjing 43, Fuding white tea, Tieguanyin, Maoxie, Benshan, Fuyun No. 6, Qimen Junye, and so on. Among them, Yuntai Tea with large leaf (Figure 3) is a legendary variety in the history of Chinese tea, originally from the Yuntai area of Anhua County, and thus named large leaf Yuntai Tea. Anhua has always been a famous tea producing area in China. Although Anhua was established as a county almost a thousand years ago, the history of tea production can be traced back more than two thousand years, so there has always been a saying that "tea was produced before the county was established".



Figure 3 Anhua Yuntai Tea with large leaf

Chinese tea trees are widely distributed. As of 2020, the total area of tea gardens in 18 major tea-producing provinces (autonomous regions and municipalities) in China reached 47.4769 million mu, of which 41.5218 million mu are available for picking. In 1982, the Tea Research Institute of the Chinese Academy of Agricultural Sciences divided Chinese tea tree regions into four major areas based on ecological conditions, production history, tea tree types, and variety distribution: the Southern District, South-Western District, South Yangtze District, and North Yangtze District (Figure 4).

The Southern District is located in the southern part of China, including Guangdong, Guangxi, Fujian, Taiwan, Hainan, and other regions. The Southern District has various types of tea tree varieties such as trees, small trees, and shrubs. The South-Western District is located in the southwestern part of China, including Yunnan, Guizhou, Sichuan, and southeastern Tibet Autonomous Region. The tea tree variety resources here are abundant, suitable for producing black tea, pu-erh tea, and so on. The South Yangtze District is located in the southern part of the

middle and lower reaches of the Yangtze River in China, including Zhejiang, Hunan, Jiangxi, and other provinces. The tea trees here are generally medium and small-leaf shrubs, suitable for making floral tea, green tea, and oolong tea. The North Yangtze District is located on the north bank of the middle and lower reaches of the Yangtze River, including Henan, Shaanxi, Gansu, Shandong, and other provinces, where the tea trees are also mostly medium and small-leaf shrubs.



Figure 4 Four major tea areas in China

## 2.2 Classification and distribution of Chinese tea

Chinese tea is generally classified into six categories based on the degree of fermentation: green tea, black tea, oolong tea, dark tea, white tea, and yellow tea. Green tea is mainly distributed in the southern regions of China, such as Zhejiang, Jiangsu, Fujian, Anhui, Hunan, Yunnan, and other provinces. Black tea is mainly distributed in the central and southern regions of China, such as Fujian, Guangdong, Hunan, Yunnan, Sichuan, and other provinces. Oolong tea is mainly distributed in Fujian, Guangdong, Taiwan, and other regions. Dark tea is mainly produced in Yunnan, Hunan, Sichuan, and other provinces. White tea is mainly produced in Fujian, Yunnan, and other provinces, with a fresh and delicate taste. Yellow tea is mainly produced in Anhui, Hunan, and other provinces.

In fact, all fresh leaves from tea trees can be processed into green tea, black tea, yellow tea, white tea, oolong tea, and dark tea using different techniques. There are no specific tea trees for green tea, black tea, or oolong tea. Some tea trees are more cold-resistant, making them suitable for cultivation in the northern regions, while others have a unique fragrance that makes them suitable for making black tea. In addition, some teas have a strong taste, making them suitable for making oolong tea. Overall, Chinese tea has a wide variety of species and is widely distributed. The types of tea and production techniques in each region have their own unique characteristics, which are also an important part of Chinese tea culture.

## 3 The Economic and Cultural Value of Chinese Tea Plant and Chinese Tea

### 3.1 The Economic value and industrial development of tea

The Chinese tea industry plays an important role in the Chinese economy. Tea is one of China's traditional agricultural products and one of its traditional export commodities. The development of the tea industry has not only driven rural economies and employment but also promoted the inheritance and development of tea culture. According to statistics, Chinese tea production and consumption both rank first in the world, and the output value of the tea industry accounts for a large proportion of China's total agricultural output value.

The development of the tea industry has also pushed for continuous upgrading and improvement of tea planting techniques and production processes. The quality and taste of tea have been widely recognized and praised.

Chinese tea has also become one of China's cultural brands, playing a positive role in enhancing China's cultural soft power and increasing its international influence.

### **3.2 The development of tea culture and its significance in Chinese culture**

Chinese tea culture has a long history that can be traced back to ancient China thousands of years ago. Tea holds an important position in Chinese culture, not only as a beverage, but also as a cultural symbol and ritual. The development of tea culture can be divided into three stages: ancient tea culture, Tang and Song tea culture, and Ming and Qing tea culture. Each stage of tea culture has its unique characteristics and contributions, which have had a significant impact on the formation and development of Chinese tea culture.

The significance of tea culture in Chinese culture is also very important. It not only reflects the lifestyle and aesthetic taste of the Chinese people, but also embodies the essence and values of traditional Chinese culture. Tea culture covers multiple fields, such as poetry, painting, calligraphy, music, and so on, and has become an important part of Chinese culture. Tea culture also serves as an important bridge for communication between China and the world, providing an important channel for the export and dissemination of Chinese culture (Shi, 2021).

The economic and cultural value of Chinese tea plants and tea cannot be ignored. The development of the tea industry has not only boosted rural economies and employment, but also promoted the inheritance and development of Chinese tea culture. The significance of tea culture in Chinese culture has made it an important part of traditional Chinese culture, providing an important channel for the export and dissemination of Chinese culture.

## **4 Germplasm Resources and Protection of Chinese Tea**

### **4.1 Germplasm resources of Chinese tea**

Chinese tea are one of the world's richest sources of germplasm resources. The germplasm resources of Chinese tea trees and tea leaves mainly include varieties, genes, species, and morphological characteristics. Chinese tea has a wide range of varieties and high genetic diversity. Different tea varieties have significant differences in growth environment, morphological characteristics, nutritional composition, and taste.

The germplasm resources of tea play an important role in the development of the tea industry and the improvement of tea quality. By researching and utilizing the germplasm resources of tea, more new and excellent varieties can be developed, which can improve the quality and yield of tea.

### **4.2 Protection status and challenges of Chinese tea**

The protection of Chinese tea has attracted widespread attention, and the Chinese government has taken a series of measures to strengthen the protection of tea.

However, the protection of Chinese tea still faces significant challenges. On the one hand, tea trees and tea leaves are threatened by environmental pollution, climate change, pests, and diseases. On the other hand, the renewal and cultivation of tea varieties still need further improvement. In addition, the development of the tea industry also faces new challenges such as market competition and technological innovation.

Therefore, it is necessary to strengthen the protection of Chinese tea and improve the technical level of collection, preservation, and utilization of tea germplasm resources. At the same time, we need to strengthen the protection and restoration of the ecological environment of tea and promote the sustainable development of the tea industry.

### **4.3 Specific measures taken by the Chinese government for tea tree protection**

The Chinese government has taken a series of specific measures to strengthen the protection of Chinese tea. For example, the government has formulated and implemented the "Tea Industry Development Plan (2016-2020)", which clearly outlines the goals and tasks for the collection, preservation, and utilization of tea germplasm resources.

The government has strengthened the collection, preservation, and utilization of tea germplasm resources. Institutions such as the Chinese Tea Research Institute and the Chinese Tea Society have established large-scale tea tree germplasm resource banks and adopted various means to strengthen the identification, screening, and cultivation of tea varieties. The government has also increased efforts to protect and restore the ecological environment of tea gardens. It has strengthened environmental monitoring and control during tea production, promoted organic tea tree planting techniques, and encouraged the restoration and protection of the ecological environment of tea gardens. The government has also strengthened the supervision and control of tea quality and food safety. It has enhanced quality control and supervision during tea production and processing, strengthened supervision and management of tea production enterprises, and ensured the quality and food safety of tea leaves. The government is also promoting innovation and development in the tea industry. It has increased investment in technology research and innovation, promoted the upgrading and transformation of the tea industry, and improved the competitiveness and sustainable development capabilities of the tea industry.

The specific measures taken by the Chinese government include strengthening the collection, preservation, and utilization of tea germplasm resources, increasing efforts to protect and restore the ecological environment of tea gardens, strengthening supervision and control of tea quality and food safety, and promoting innovation and development in the tea industry. These measures help to protect the germplasm resources of Chinese tea, promote the development of the tea industry, and improve the quality of tea leaves.

## **5 Review and Prospect**

Chinese tea is an important part of traditional Chinese culture and one of the most important agricultural products in the world. The origin of Chinese tea trees and tea leaves can be traced back to ancient China thousands of years ago. Through long-term historical development and cultural exchanges, a unique tea culture and tea industry system have been formed. Chinese tea is widely distributed, with a variety of species and abundant germplasm resources. The tea industry has become an important pillar of the Chinese economy and culture, playing a positive role in enhancing China's cultural soft power and increasing its international influence.

The protection of Chinese tea is an important guarantee for the sustainable development of the tea industry. The Chinese government has taken a series of measures to strengthen the collection, preservation, and utilization of tea germplasm resources, increase efforts to protect and restore the ecological environment of tea gardens, strengthen supervision and control of tea quality and food safety, and promote innovation and development in the tea industry. These measures help to protect the germplasm resources of Chinese tea, promote the development of the tea industry, and improve the quality of tea.

In the future, the focus of Chinese tea research should be on strengthening the collection and utilization of tea germplasm resources, exploring new ways and methods to improve the quality of tea, promoting technological innovation and upgrading in the tea industry, and promoting its sustainable development. At the same time, it is also necessary to strengthen the protection and restoration of the ecological environment of tea gardens, strengthen supervision and control of tea quality and food safety, and promote the healthy development of the tea industry.

### **Author's contributions**

LCC is the person in charge of this project, completing the paper concept, initial draft writing, revision, and final draft. The author read and approved the final manuscript.

### **Acknowledgement**

This study was supported by Funding for Cuixi Innovation Research & Development Project of Cuixi Academy of Biotechnology, Zhuji.

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