



Green Tea *Camellia sinensis*

Name: Green tea (*Camellia sinensis*), belongs to the Theaceae family. Other names include Chinese tea, camellia tea, gruner tea and matsu-cha.

Identification and cultivation: Green tea is a perennial and an evergreen shrub that is pruned to 1-2m high for cultivation. However, when left to grow wild the plant will grow into a 9m tall tree with a bowl-shaped canopy. The bark of the plant is rough and grey. The leaves are alternate. They grow 5-10cm long, are oval, and have a dark green, leathery appearance, the leaf edges being serrated, the tip of the leaf being pointed. The flowers are hermaphrodite and require bee pollination. They are coloured white and grow either on their own or in clusters of two to four on small branchlets from the leaf axils. They have five to nine petals with five sepals growing to a diameter of 4cm. The plant prefers a sunny to shaded area. Originally it was grown on the edge of a forest at 2100 to 2700 metres; however it can be grown at much lower levels. It prefers well-drained loamy soils or light sandy soils. It will tolerate temperatures as low as 0°C but lower than this will cause the plant to become dormant or grow slowly (Edible Wild Food, 2018). Green tea is currently cultivated in over 50 countries, including India, Africa, Argentina and the USA. However, in 2014 China produced over 80% of the world's green tea. The annual production during this year was approximately 4.72 million tons, representing \$40 billion (Fang, Meinhardt and Zhang, 2014).



Morphology of tea plant
Source: John Coakley Lettsom

Parts Used: Leaves and seeds.

Harvesting: Leaves: A plant has to be at least two years old before it is mature enough to be harvested. By five years old it is a good tea leaf producer. In late winter the tips of the plant need to be pruned, ready to start harvest in spring. The first two to three leaves and the tip of the shoot is picked every seven to 15 days throughout the growing season, the harvest beginning in spring once the leaves begin to grow. These are then dried for use later, ideally on a tray in a thin layer in the sun.

Different types of tea are made by different preparation. To make green tea the leaves need to be steamed for 1-2 minutes then ran under cold water immediately. This process is called shocking and allows the leaves to retain their vibrant colour. The leaves then need to be rolled into tubes. These are then baked for 10-12 minutes at 102°C, turning them every 5 minutes. Once the leaves are completely dry the tea is ready. Let them cool and seal them in a glass container.

Seeds: These are pressed for oil, providing a sweet-tasting oil. The seeds are often added to culinary dishes to add flavour (Edible Wild Food, 2018).

Energetic Character: Astringent, bitter taste, this is altered by the temperature and steeping time.

Constituents: Chemical composition varies according to the methods used for growing and harvesting. Major components are caffeine, which averages 3%, polyphenols, which are mainly flavonoids (catechin, epicatechin, epicatechin gallate, epigallocatechin, gallate and proanthocyanidins), methylxanthines, theobromine, theophylline, tannin, diphenylamine, oxalic acid and trace vitamins and minerals.

Therapeutic Actions: Antioxidant, antibacterial, antiviral, anticarcinogenic, antihypertensive, anti-inflammatory, antimalarial, antiproliferative, antithyroid, cardioprotective, CNS stimulation, diuresis, gastric acid stimulation, increased hepatoprotective, mental alertness, inhibition of platelet aggregation, iron chelator, neuroprotective, thermogenic activite.

Medicinal Uses: Cancer support: in vitro studies shown for a number of different types of cancer (lung, prostate, colon, stomach, pancreatic, bladder, oral, leukaemia, breast, cervical and bone), green tea causes an increase in cellular apoptosis.

Cardiac support: Used to balance cholesterol levels, decrease blood pressure, lower risk of atherosclerosis, decrease thrombosis risk and decrease inflammation.

Neurological support: Providing protection and rescue before and after exposure to toxins. Potentially lowering the risk of neuron death.

Iron Chelation: Support for people with Parkinson's, Alzheimer's and haemochromatosis.

Diuretic: Stimulates urine production.

Weight loss: Increased consumption is linked with weight loss.

Diabetes support: Linked with lowered levels of serum glucose and improved kidney function.

Dental caries and gingivitis: linked with lowering dental plaque and therefore reducing incidence of caries and gingivitis (Braun and Cohen, 2015).



Image of a tea bud; by
Mandeep Singh
https://commons.wikimedia.org/wiki/File:Tea_Bud.jpg

Cautions and Contradictions: Excessive intake will increase likelihood of adverse effects. Not recommended for people with hypertension, cardiac arrhythmias, severe liver disease, anxiety, psychiatric disorders or insomnia. Best taken on a full stomach. If taken with meals will inhibit iron absorption. Not recommended in pregnancy due to inhibition of iron.

Adverse effects: High doses lead to central nervous system (CNS) stimulation, diuresis, teeth staining (tannins in tea), insomnia, fatigue, nausea, abdominal pains, confusion.

Dosages: Some research suggests 8-10 cups whereas others state 3-5 cups. However, this is dependent on types of tea and strength. Generally, a good quality organic tea will only require half a dried teaspoon to be infused for 10 minutes into water (80°C) per cup.

Cancer support – 5 or more cups daily.

CVD protection 3-10 cups.

Periodontal disease gel / chewable tablets / mouthwash twice a day, 2-4 weeks (Braun and Cohen, 2015).

Culinary: Tea is the second most popular drink on the planet after water. *Camellia sinensis* seeds are pressed for their oil and used to cook many Asian foods, their taste being somewhat sweet in flavour.

History and Mystery: Tea has been used in China for over 5000 years. A book written in the Tang Dynasty (600-900CE) by Lu Yu notes the importance of green tea. Eisai, a Zen priest in 1211, noted the effects tea may have on five organs.

Matcha tea is produced in Japan. It is a powdered green tea that is rich in antioxidants and traditionally used in the Japanese tea ceremony. Green tea was brought to Japan by Buddhist monks who were studying in China in 805. The tea was planted in Kyoto and was the drink of the elite. In the 15th century they learnt to shade the tea plants prior to harvest to obtain the correct taste. It is still used by Buddhist monks as it helps them find a level of calmness, whilst increasing their mental and spiritual alertness and being (Mercola, 2018).

References:

1. Braun, L. and Cohen, M. (2015) Herbs and Natural Supplements - An evidence-based guide, 4th edition, Melbourne: Elsevier.
2. Edible Wild Food (2018) Tea Plant *Camellia sinensis* [Online], Available: <http://www.ediblewildfood.com/tea-plant.aspx> [August 2018].
3. Fang, W.-P., Meinhardt, L.W. and Zhang, D. (2014) 'Varietal identification of tea (*Camellia sinensis*) using nanofluidic array of single nucleotide polymorphism (SNP) markers', Horticulture Research, July, p. 30.
4. Mercola, J. (2018) Matcha Green Tea: A Potent Tea With Amazing Health Benefits, 12 May, [Online], Available: <https://articles.mercola.com/teas/matcha-green-tea.aspx> [August 2018].

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Advisory Note: This text is given a general guidance. If any adverse reactions occur or symptoms persist, please contact a qualified medical herbalist or doctor immediately.