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# Tea and health: a historical perspective

John H. Weisburger*

*American Health Foundation, One Dana Road, Valhalla, NY 10595-1599, USA*

**Abstract**

In many parts of the world, green tea and black tea are produced from the plant *Camellia sinensis*. Tea is one of the most widely consumed beverages, second only to water. It is one of the safest beverages since it is made with boiling, sterile water and has been popular for over 4000 years. Dogma has it that people knew it might have health promoting properties since it was frequently used as fluid supply for patients suffering from infectious diseases. However, detailed, focused research on the health benefits of tea is of recent vintage. Initially, such research was carried out in Japan and China and, because the local customs, this research involved green tea. Now, a number of other scientists in Europe and in the United States have conducted investigations on black tea, and in some laboratories exacting comparative studies were performed utilizing black and green tea. The major interest in tea and health stems from the high level of antioxidant tea polyphenols in green tea and black tea. The chemistry of the tea polyphenols has been worked out to some extent. Thus, their role in lowering the risk of heart disease and of a number of types of cancer begins to be understood. Most productive are multi-disciplinary approaches, considering data from epidemiology and field studies, and laboratory research in animal models for heart disease and cancers of various types, as well as through in vitro experiments. © 1997 Elsevier Science Ireland Ltd.

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The tea plant, *Camellia sinensis*, is an evergreen tree belonging to the family of Theaceae. Harvest of its leaves is by hand with special shears, or by machines. When the leaves are processed and dried, they yield tea when added to hot boiling water. Depending on the treatment of the harvested leaf, three main types of tea are obtained. The leaves of *Camellia sinensis* contain specific polyphenols and an enzyme, polyphenol oxidase. As soon as the leaves are chopped, the enzyme is activated and the polyphenols are oxidized. The original users of tea in China exposed the cut leaves to hot steam, or heat. After steaming, the leaves were dried in the sun, or on a tray in a stream of hot air. It is now known that this treatment inactivated polyphenol oxidase. The product is green tea, in which the original polyphenols belonging to the catechin family, especially epigallocatechin gallate, constitute about 30% of the weight of dry leaves. If the tea leaves are allowed to stand for less than an hour before the enzyme is inactivated by heating, the product is oolong tea, consumed frequently in Taiwan and also in China. On the other hand, if the rolled chopped leaves are allowed to stand for 3–6 h, the catechins are oxidized by the enzyme to other types of polyphenols, mainly theaflavine gallate and thearubigins, and the resulting tea is black tea, upon drying [1–5].

The history of tea as a beverage is traced by the Chinese to about 2700 BC at the time of Emperor Shen Nung. The first recorded mention of tea, however, is in an old Chinese wordbook, Erh Ya, about

* Tel.: +1 914 7897141; fax: +1 914 5926317; e-mail: johnweisburger@nymc.edu

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350 BC. From China, the tradition of tea drinking came to Japan about the 6th century. It was then used by the privileged society, and became popular for all only about 700 years ago. Later, tea use was introduced into what is now known as Indonesia and from there through the Dutch colonials into Holland. It was also cultivated in India and thence imported to England, where it became popular. In the middle of the 17th century the English played a major role in merchandising and popularizing tea. Tea at one time had value as currency and in international trade. The English practiced certain restrictive trade conditions and imposed taxes on the colonies. After the British Parliament approved the Tea Act in 1773, concerned with taxation of the colonies, the American colonials protested against the new British custom duties on imported tea by throwing tea on ships overboard in Boston (Boston Tea Party) and also in Baltimore harbor.

Tea is consumed by hundreds of millions of people worldwide. By tradition, people in the Orient prefer green tea or oolong tea. In North Africa green tea is also used. In much of the rest of world, black tea is the customary beverage. In the United Kingdom, Ireland, and in Canada, black tea is taken with milk and often sugar. In most other countries, black tea is consumed sweet or with lemon. Green tea is usually drunk neat. In many countries, but particularly in the Orient, it is customary to offer a cup of tea to a guest during a social or business call. Ice tea was first introduced in 1904 at the St. Louis World's Fair during a spell of hot weather. The custom of drinking ice tea remains largely American: in the US nearly 75% of tea is consumed cold, and the practice is spreading elsewhere. In Japan, a diversity of beverages, but especially tea, is sold from vending machines located along the street.

The tea leaves also contain caffeine. Tea has about 50 mg per cup or only 40–50% of the caffeine content of coffee. In many people, caffeine has a pleasant, stimulating action. People with difficulty sleeping may use a decaffeinated tea. This is produced under mild conditions, extracting specifically caffeine, and leaving the tea polyphenols. Caffeine has had some cancer-preventing action, but not as extensive as that of the tea polyphenols [6,7].

More recently, detailed research has explored through epidemiologic and marker studies the health-promoting actions of tea. Tea drinkers seem to have a lower risk of heart disease and stroke, and several types of cancer [8–14]. Experimental research in laboratory animals has demonstrated inhibition of carcinogenesis at a number of organ sites; of special interest are tissues such as lung, stomach, and esophagus, associated with tobacco carcinogens or salt [3–6,15,16]. Other investigations noted inhibition at organs related to nutritional carcinogenesis, such as colon or mammary gland [17–19]. These laboratory approaches provide tools to explore the underlying mechanisms. Inhibition through detoxifying enzyme induction [20] and also antioxidant effects has been documented [21], although in some cases activation reactions may also be stimulated. This could be a matter of dose-response controlling the ratio biochemical activation/detoxification. In any case, tea is a readily available plant extract for further interesting studies designed to clarify its actions in health promotion.

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