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# BENEFITS AND DRAWBACKS OF GREEN TEA: REVIEW

**Shashidhar**

Assistant professor, Department of Forensic Science,  
Jain (Deemed to be University), Bangalore-560027, India.  
Email Id: es.shashidhar@jainuniversity.ac.in

## **Abstract**

*After drink, tea is the most drunk beverage in the world. Green tea contains more catechins than black tea or oolong tea and is a 'non-fermented' tea. Catechins are antioxidants that are potent in vitro and in vivo. In addition, the antioxidant value of this form of tea is increased by the content of certain minerals and vitamins. Green tea has been known by traditional Chinese medicine as a safe beverage since ancient times. Recent human studies indicate that green tea can respond to reducing the risk of cardiovascular disease and certain types of cancer, as well as promoting oral health and other physiological functions such as antihypertensive effects, body weight regulation, antibacterial and antiviral activity, solar ultraviolet safety, increased bone mineral density, anti-fibrotic properties, and anti-fibrotic properties. The inclusion of green tea in the category of drinks with functional properties has contributed to renewed interest in its health benefits. However, while all the data from research on green tea is very positive, further studies are required to properly understand its human health contributions and advise on its daily use in Western diets, where consumption of green tea is now minimal and intermittent.*

**Keywords:** Black, Green, Health, Human, Tea, Beverage, Health care, Antibacterial.

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## **I. INTRODUCTION**

Tea, a product made up from leaf and bud of the plant *Camellia sinensis*, is the second maximum fed on beverage in the global, well ahead of coffee, beer, wine and carbonated tender liquids. Originating from China, tea has received the sector's flavor inside the past 2000 years. The financial and social interest of tea is apparent and its intake is a part of many human beings daily habitual, as an normal drink and as a healing aid in lots of illnesses [1]. Depending on the manufacturing process, teas are categorised into 3 fundamental kinds: 'non-fermented' inexperienced tea (produced by drying and steaming the clean leaves to inactivate the polyphenol oxidase and hence, non-oxidation occurs); 'semi-fermented' oolong tea (produced when the fresh leaves are subjected to a partial fermentation level before drying); and 'fermented' black and purple (Pu-Erh) teas which undergo a put up-harvest fermentation stage before drying and steaming, although the fermentation of black tea is because of an oxidation catalyzed through polyphenol oxidase, and that of Pu-Erh tea is attained by the use of microorganisms.

A observe mentioned a in step with capita imply intake of tea inside the world of a hundred and twenty ml/ day. About 76–seventy eight% of the tea produced and consumed is black tea,

20–22% is green tea and much less than 2% is oolong tea. Black tea is ate up mainly in Europe, North the united states and North Africa (except Morocco) at the same time as green tea is extensively under the influence of alcohol in China, Japan, Korea and Morocco; oolong tea is popular in China and Taiwan. In USA, the 80% of tea consumed is black ice tea [2]. Despite the fact that health blessings were attributed to green tea intake considering that the beginning of its history, medical investigations in this beverage and its ingredients had been underway for less than three many years. In vitro and animal research, and medical trials using putative intermediary indicators of disorder, specifically biomarkers of oxidative strain status, offer sturdy proof that inexperienced tea polyphenols (GTP) may additionally play a position in the hazard and pathogenesis of several chronic sicknesses, in particular cardiovascular disease and most cancers, and related pathologies. In addition, several research suggest a beneficial impact of green tea intake on bone density, cognitive characteristic, dental caries and kidney stones, amongst other results. Over the last years, numerous epidemiological and clinical research have discovered numerous physiological responses to inexperienced tea which can be applicable to the merchandising of fitness and the prevention or treatment of a few continual sicknesses. But, the effects from epidemiological and medical research of the relationship among inexperienced tea intake and human health are combined. For example, conflicting results among human research may additionally rise up in component, from ignoring socioeconomic and lifestyle elements in addition to through insufficient methodology to define tea training and consumption [3].

Nutrients may be appeared as practical if it is adequately demonstrated to affect beneficially one or greater target features within the frame, past ok dietary effects in a way which is relevant to either the kingdom of properly-being and health or the discount of the hazard of a sickness, so green tea has been proved to have practical homes and at gift, its consumption is widely encouraged. The goal of this newsletter is to revise the maximum recent research on green tea useful consequences and to evaluate its potential hobby in western diets [4].

## II. GREEN TEA AND HUMAN HEALTH

Green tea has been taken into consideration a medicine and a healthy beverage for the reason that ancient instances. The traditional Chinese medication has encouraged this plant for headaches, body aches and pains, digestion, despair, detoxing, as an energizer and, in popular, to lengthen existence. Inexperienced tea leaves comprise three predominant additives which act upon human health: xanthic bases (caffeine and theophylline), essential oils and specifically, polyphenolic compounds. Caffeine acts specially upon the imperative worried gadget, stimulating wakefulness, facilitating ideas affiliation and reducing the sensation of fatigue. A number of the results resulting from caffeine are stimulated by means of theophylline tea content. Theophylline induces psychoactive interest, it also has a slightly inotrope and vasodilator effect, and a much higher diuretic impact than caffeine. However, its most thrilling effects may be seen on the bronchopulmonar and respiration level. Theophylline causes a non-precise rest on the bronchial clean muscle, and respiration stimulation is likewise determined. Important oils are in a excellent quantity risky and that they evaporate from the beverage after a while, consequently it isn't very handy to overextend the brewing time. Among their homes, the only of facilitating digestion need to be highlighted. Inexperienced tea is the kind of tea with the higher percent of important oils.

However, inexperienced tea has received a splendid deal of attention especially due to its content of polyphenols, which can be sturdy antioxidants and gift critical biological properties

[5]. Numerous research have also tested that the aqueous extract of GTP possesses antimutagenic, antidiabetic, antibacterial, and hypocholesterolemic houses. Useful consequences in oral illnesses together with protection towards dental caries, periodontal disorder, and tooth loss (which may additionally notably affect someone's universal health) were also described. Among all GTP, catechins and gallic acid have been especially taken into consideration to be the main players within the beneficial results on human health next particular [6].

### III. HARMFUL EFFECTS OF TEA OVER CONSUMPTION

Dangerous results of tea over intake (black or inexperienced) are because of 3 principal factors: (1) its caffeine content material, (2) aluminum presence, and (3) the effects of tea polyphenols on iron bioavailability. A day-long consumption of green tea advanced the cognitive and psychomotor overall performance of healthy adults in a way similar to coffee, however inexperienced tea (which incorporates much less caffeine) is much less probably than coffee to disrupt sleep quality at night. A examine as compared the caffeine content in the equal form of tea but synthetic through distinctive fermentation approaches, and concluded that the caffeine degree presented the subsequent order: black tea \_ oolong tea \_ green tea \_ sparkling tea leaf. Any other observe determined the caffeine content material in a total of forty five tea samples, which includes 'fermented' teas (red and black teas), oolong tea and green tea samples; the consequences confirmed that caffeine presence is higher inside the case of black teas (forty one.5– sixty seven.4 mg/g), while green and oolong teas show a mean caffeine content of 32.5 and 29.2 mg/g, respectively [7].

Few researchers also pronounced that caffeine content is better inside the case of 'fermented' teas, displaying values between 2.4 and 4.8%, whereas 'non-fermented' teas display caffeine ranges ranging between 1.47 and 3.86%. Table 4 includes information at the caffeine content in beverages broadly fed on. The caffeine content in green tea may additionally range in step with the type of tea and the form of instruction (i.e., brewing time); generally, bagged tea produces a better percent of caffeine than tea leaves. In any case, despite the fact that inexperienced tea caffeine content is low, its intake is not advisable in cases of unique sensitiveness to xanthic bases. The terrible results produced with the aid of caffeine are anxiety, sleep disorders, vomits, complications, epigastric ache, tachycardia. Theophylline poor effects are similar to those of caffeine, but they only occur with excessive portions intake. As a consequence, green tea should now not be taken by means of sufferers tormented by heart situations or fundamental cardiovascular issues. Pregnant and breast feeding girls must drink no extra than 1–2 cups/day, considering it can motive an growth in coronary heart rhythm. It's also convenient to govern the concomitant intake of green tea and a few capsules, due to its diuretic consequences [8].

Concerning aluminum presence in black and inexperienced tea, a few studies revealed the excessive capability of this plant to accumulate Al. This component is crucial for patients with renal screw ups due to the fact Al can be accumulated with the aid of the frame, resulting in neurological sicknesses; it's miles therefore vital to control the intake of food with high quantities of this metallic. The possible connection between increased tissue Al content and problems which include osteomalacia and neurodegenerative problems (i.e., Alzheimer's ailment) has woke up hobby in Al consumption via weight-reduction plan. A researcher found concentrations of Al in inexperienced and black teas (as infusions) accounting for 431–2239 µg/L, while in espresso they located decrease concentrations (9.1– 30.8 µg/L). In a have a look

at carried out in Italy, those authors anticipated the tea contribution to the overall Al nutritional consumption as 665  $\mu$ /week (thinking about a weekly imply consumption of 2 cups).

In keeping with several authors, Al nutritional consumption need to now not exceed 6 mg/day if you want to keep away from probably poisonous degrees. Few researchers evaluated Al presence in meals and liquids widely fed on in Spain, and located that Al stages in tea ranged from forty three.42 to 58.04 $\mu$ g/g noted dry weight of the stable product, and from 13.91 to 27.forty five  $\mu$ g/L inside the corresponding infusions; levels in coffee samples numerous among 25.6 and 29.08  $\mu$ g/g mentioned dry weight of the strong product, and from 7.12 to 9.14  $\mu$ g/L within the corresponding infusions. A have a look at found that black tea carries nearly six-fold more Al than inexperienced tea, and the extraction of Al in black teas turned into higher than the one discovered in green teas; the Al concentrations within the tea infusions have been constant after 5 min of extraction. Those authors also indicated that the variations between different samples may be due to unique soil situations in addition to exceptional harvesting intervals, and the impact of the water best. Following this line of examine, several authors taken into consideration that this detail does not seem to be tons more bioavailable in tea than in other nutritional assets [9].

On the other hand, it cannot be overlooked that tea infusions might also incorporate specially bioavailable and neurotoxic compounds including Al maltolate, but this is currently speculative. At this appreciate, A observe pronounced that the composition of Al species could range relying on the technique of tea manufacturing, and for non-fermented teas, most of the leached Al is especially located in big or small organic compounds; in organic complexes with small molecular loads, which includes citrates, the Al complexes are greater bioavailable than in inorganic complexes (including hydroxide), however usually, Al is poorly absorbed by using the body. As a consequence, destiny research designed to correctly check the presence and bioavailability of Al in inexperienced tea leaves is vital.

Several studies have confirmed that black tea seems to inhibit the bioavailability of non-heme iron with the aid of seventy nine% to 94% whilst both are ate up concomitantly; the effect of this interplay relies upon at the iron intake and iron reputation of the person. Likewise, green tea catechins may have an affinity for iron, and inexperienced tea infusions can purpose a huge lower of the Fe bioavailability from the weight loss plan. On the one hand, a few authors verify that tea ought to now not be fed on through patients affected by anaemia. As an example, iron deficiency anaemia amongst youngsters in Saudi Arabia and the United Kingdom can be exacerbated through the ordinary consumption of tea with meals. Then again, this effect may be of advantage to sufferers with genetic hemochromatosis. It's far well worth noting that the interaction between tea and iron may be mitigated via the addition of lemon or ingesting tea among food [10].

#### IV. CONCLUSION

Inexperienced tea has been fed on in China and other Asian nations on the grounds that historical times so that it will maintain and enhance health. In recent times, inexperienced tea is taken into consideration one of the most promising dietary sellers for the prevention and remedy of many illnesses and therefore, it's far being studied appreciably international. Numerous research in a ramification of experimental animal models have tested that aqueous extract of the mayor GTP designed as catechins (EGCG, EGC, ECG and EC) possess antioxidant, antimutagenic, antidiabetic, antibacterial and antiviral, and specifically, cancer-

preventive homes. Epidemiological studies advocate that consumption of inexperienced tea may additionally have a protecting effect against the improvement of numerous cancers. Preclinical research of green tea and its polyphenolic components have validated antimutagenic and anticarcinogenic hobby, and inhibition of increase of tumor mobile traces and animal tumor fashions, together with cancer. Inexperienced tea may additionally have chemopreventive properties, and enhancement of chemotherapeutic retailers has been verified.

In addition, numerous epidemiological studies with people have confirmed that everyday inexperienced tea consumption has beneficial results and it indicates a extensive rate of safety in opposition to the development of a few oral diseases and in opposition to sun radiations. It additionally contributes to body weight control and to the upward push of bone density in addition to being able to stimulate the immune device. Furthermore, green tea consumption has been currently reported to behave positively towards neurodegenerative sicknesses inclusive of parkinson and alzheimer sickness. Catechin antioxidant strength is also strengthened through the presence of other phenolic compounds, vitamin C and minerals which includes Cr, Mn, Se, and Zn, despite the fact that particular records regarding this fact are nevertheless scarce.

However, conflicting effects between cohort research carried out in distinct international locations might also arise from confusion within the frequency and timing of consumption, and the marked contrasts inside the socioeconomic and way of life factors related to tea drinkers. It is also important to recollect the sort of tea or its instruction (e.g., quick time vs. Lengthy brewing time and warm tea vs. Iced tea) due to the marked effect of these elements on polyphenol content material and attention. It is also important to attract interest at the need of similarly-in-intensity research on the character and mechanisms of the energetic inexperienced tea compounds, at the bioavailability of the exceptional catechins in humans, and appropriate dose ranges to act as purposeful food.

Considering that green tea beneficial health consequences are being increasingly proved, it may be really helpful to inspire the normal intake of this broadly available, tasty and cheaper beverage as an exciting alternative to different drinks, which do now not most effective show the beneficial consequences of inexperienced tea, however are also more lively, do contain greater caffeine (inexperienced tea consists of much less caffeine than black tea, espresso or cola smooth-beverages), are rich in additives and/or CO<sub>2</sub>. Even as no single food item can be anticipated to provide a full-size effect on public fitness, it's miles vital to be aware that a modest effect among a dietary factor and a disease having a prime effect at the maximum standard causes of morbidity and mortality, i.e., most cancers and coronary heart sickness, need to advantage extensive interest. Taking all this into account, it might be beneficial to remember the regular intake of green tea in Western diets.

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