

## A REVIEW PAPER ON BENEFITS OF TEA CONSUMPTION

**Manjeet Kaur\***

\*SOP,

Sanskriti University, Mathura, Uttar Pradesh, INDIA

Email id: manjeet.pharmacy@sanskriti.edu.in

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### ABSTRACT

*Using phytochemicals to boost the immune system or fight infections has been around for a long time. Tea and its constituents are an important element of these strategies for maintaining health and reducing the incidence of a variety of malignancies. Tea, as well as its contents, are an important part of these measures for maintaining health and lowering the risk of many cancers. Nutritional support is a developing innovation in the areas of diet-based treatments, and tea and its ingredients are a key component of these efforts to preserve health and lower the risk of many cancers. Apart from water, tea is the most extensively consuming beverage on the planets. The leaves of the Camellia sinensis plant are used to make the three most common forms of tea: green, black, and oolong. Tea is high in antioxidants, antihypertensive compounds, anti-inflammatory compounds, antibacterial compounds, cholesterol-lowering compounds, neuroprotective compounds, as well as thermogenic compounds. Tea as well as its bioactive polyphenolic components have been connected to a multitude of health's benefits, including the prevention of cancer, cardiovascular disease, diabetes, arthritis, stroke, genital warts, and obesity, according to extensive scientific research, epidemiological studies, and meta-analyses. There are still debates concerning the advantages and hazards of tea use, but the many health benefits greatly outweigh the few known drawbacks. With the rise of scientific research on the roles of tea in human life's, this review aims to emphasize the benefits as well as hazards of tea usage.*

**KEYWORDS:** *Black Tea, Benefits, Cardiovascular Health, Green Tea, Tea Consumption.*

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### 1. INTRODUCTION

The phrase "functionally foods" was 1<sup>st</sup> used in Japan in 1980. Functional foods are described as "any foodstuff having components that offer physiological advantages in addition to meeting basic nutritional needs." Plant and animal sources are both used to make functional foods. One of the most essential functional foods is tea. Tea is the second most popular beverage in the planet. For over 50 millennia, tea has been made entirely from the leaves of the Camellia sinensis plant[1]. Tea is a plants that originated in Southeast Asia and is now produced in over 30 countries across the world. Every year, 3 billion kilograms of tea are produced and consumed. Tea is classified into three types depending on how it is treated throughout the manufacturing process. Black tea, which is extensively consumed in Western countries, accounts for 78percentage points of worldwide tea productions, while green tea, which is largely consume in Asian countries, versions for 20 percent, and oolong tea, which is primarily produced in southern China, accounts for two percent[2].

The production methods for the three main kinds of tea, black, green, as well as oolong, vary. Green tea is made by steaming's or pan frying newly collected leaves to inactivate the enzymes polyphenol oxidase, which prevents fermentations and produces a dehydrated, steady beverage. New leaves are allowable to wither till their moistures level is lowered to the point when natural polyphenols are transformed to polymeric chemicals termed theaflavins as well as thearubigins, reducing catechin concentration[3]. Tea (Oolong)is made by drying the leaves as well as burning them soon after they have been rolled to stop the oxidation. Oolong tea is said to be around half as agitated as black tea. Simple polyphenols are oxidized to more complex condensed polyphenols during the fermentation process, giving black as well as oolong teas their distinct hues and tastes. The polyphenol concentration is reduced, while the caffeine level is increased, as a result of the prolonged fermentation. When compared to green tea, black tea comprises two to three times the amount of caffeine[4]–[6].

In the past several decades, in vitro animals as well as in the vivo research have shown the endless advantages of tea. The existence of PPs has been linked to positive health outcomes. Its function in the prevention of congenital deficits, cardiovascular illness, cancer, neurodegenerative disorders, depressions, as well as a variety of others illnesses has been addressed in many publications. Because there has been little discussion regarding the risky factors connected with tea, the goal of this study is to concentrate on the potentials for tea to have both positive and negative impacts, as well as to increase awareness of the uncommon but underestimated dangers[7].

### *1.1 Profits of Tea Consumption:*

#### *1.1.1 Cardiovascular Health as well as Tea:*

Cardiovascular diseases (CVDs) is the world's important cause of mortality. The development and pathophysiology of CVDs are influenced by a number of intrinsic and extrinsic variables. Excessive cholesterol, atherosclerosis, arterial calcification, higher homocysteine, as well as many other variables have been classified by the American Heart Association (AHA) as risk factors for CVDs. Tea (Green)catechins, particularly EGCG, have a beneficial effect on endothelial as well as largely vascular functioning, according to growing data from animal, human, as well as cell culture models. A lot of epidemiological studies have looked at the link among tea intake as well as the risk of cardiovascular disease. Since the levels of PPs used in this research are identical to those founds in 1 liter of tea, regular use of black and green tea may give practically complete protection against HTN.

#### *1.1.2 Atherosclerosis:*

Only a few human researches have looked at the link among tea or the flavonoid consumption as well as atherosclerosis. Carotid plaques were shown to be less common in women who drank more tea. In middle-aged Finnish males, Mursu found a link between increased flavonoid consumption and reduced carotid atherosclerosis. Though, a vast amount of research has been done using animal models to investigate the link among flavonoid-rich meals or extract and the development of atherosclerosis. Researchers studied the effects of flavonoid-rich meals or extracts on the development of atherosclerosis in apolipoprotein E deficient mice and hamsters. In ApoE-deficients mice, tea and tea-derived flavonoids, isolated quercetin, red wine-derived PPs, as well as a pure phenolic acids derivative from honey have all been shown to prevent atherosclerotic plaque growth.

### *1.1.3 Functions of Endothelial:*

The endothelium, which lines all blood arteries on the inside, serves as a partially permeable barrier among blood and tissues. It produces a number of chemicals that regulate vasomotor tone, leukocyte adhesion, platelets activities, and vascular smooth muscle cell proliferation, including NO, among the most important substances produced by the endothelium and a key regulator of arterial wall tone. The absence of normal endothelium-dependent and NO-mediated vasodilation in the artery causes endothelial dysfunction. Endothelial dysfunction is thought to be a precursor to the development of cardiovascular disease and events.

Function of Endothelial may be measured in many ways. The effects of possibly vasoactive drugs have been studied in vitro using isolated arteries from animals. Tea as well as tea flavonoids induce NO as well as endothelium reliant onvasorelaxation of rat aortic rings, according to the findings of numerous in vitro investigations. The flow mediated dilatations of the brachial artery has been quantity using ultrasonography in humans. FMD is a noninvasive method that evaluates NO-dependents arterial vasodilations in reply to increased blood flow-induced shear stress.

### *1.1.4 Antioxidant Belongings of Tea:*

The anti-oxidatives characteristics of tea polyphenols contribute to the possible fitness benefits of tea consumptions. In cell-free systems, tea preparations entrap reactive oxygen species such as superoxide, hydroxyl, as well as peroxy radicals, as well as nitric oxide, nitrogen dioxide, singlet oxygen, and peroxy nitrite, reducing damage to lipid membranes, proteins, and nucleic acids. The most effective catechin in tea is EGCG, which interacts with the majority of reactive oxygen species. In vitro, both green and black tea have been found to block the oxidation of lipoproteins caused by Cu<sup>2+</sup>, suggesting that they may help prevent atherosclerosis and other cardiovascular illnesses. In a number of clinical studies, a single dosage of tea has been shown to increase plasma antioxidant capacity in healthy adults within thirty to sixty minutes. Another study discovered that drinking tea and encapsulated tea extracts on a regular basis for one to four weeks decreases oxidative status markers. Green tea has more antioxidants than black tea. Tea phenols boost antioxidant capacity and defend against harmful reactive oxygen species in a well-balanced diet.

Tea phenols bind reactive oxygen species such as peroxy radical, singlet oxygen, as well as hydroxyl radical in a cell-free environment, protecting lipid membranes, protein, and DNA from ROS-mediated damage. Catechins have antioxidant capabilities owing to their vicinal dihydroxy or trihydroxy structure, which may chelate metal ions and prevent free radical production. This structure's strong reactivity to quench free radicals is further enhanced by its electron delocalization.

### *1.1.5 Absence of Toxicity:*

Puerh black tea, a kind of black tea made by drying and fermenting raw green tea leaves, was used as a health drink in Japan, China, and Taiwan for about 2000 years. A research on tea extract toxicity in Sprague-Dawley rats found no treatment-related effects for dietary administration, indicating that high-dose black tea extract as a dietary supplement is safe for both animals as well as humans.

### *1.1.6 Anti-inflammatory Effect:*

Tea as well as its extracts have been exposed to having anti-inflammatory, anti-cancer, as well as anti-cardiovascular disease belongings. Several epidemiological studies have linked high levels

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of uric acids as well as C-reactive protein to an increased risk of cardiovascular disease. According to a research, tea supplementation substantially lowered various degrees of risk by lowering UA as well as CRP levels due to the synergistic actions of tea phenolics. Inflammation has a role in many diseases like arthritis, diabetes, cancer, heart disease, as well as obesity, thus this may have a big impact on public health.

#### *1.1.7 Cancer and Tea:*

Tea's widespread use has sparked interest in its potential application in the chemoprevention of the carcinogenesis as well as its associated phenomena is mutagenesis. Numerous population founded research back up tea's cancer-preventive properties. The oxidative damage produced by cigarette smoking is the most common cause of cancer. Tea polyphenols, according to researchers, are strong anti-oxidants that activate phase-two detoxifying enzymes, which decrease the hazard of cancer by decreasing DNA injury in cells and cancer activation, which leads to malignancy.

#### *1.1.8 Prostate cancer inhibition:*

Prostate cancer the 2<sup>nd</sup> leading reason of cancer connected deaths in the United States, is the greatest often studied non cutaneous cancer. Tea extracts and TFs have been shown in studies to inhibit androgen-sensitive human prostate cancer cells.

#### *1.1.9 Skin Cancer:*

Tea and tea polyphenols have been proven to prevent skin carcinogenesis in many investigations. Oral supervision of black tea, green tea, or EGCG inhibits or, in few instances, regresses the growth of well-established skin cancers. Mice with papillomavirus exhibited full retardation. When tumor-bearing mice were given black tea, the formation of squamous cell carcinomas, nonmalignant tumors, as well as tumor volume were significantly decreased. Apoptosis was enhanced as well, whereas DNA synthesis was slowed.

## **2. LITERATURE REVIEW**

Naghma Khan et al. discussed a review on Tea and Human [8]. Tea is the second greatest inexpensive beverage drunk by humans, behind the water. Tea intake has been regarded to be good to one's health since ancient times. Thanks to recent medical studies, this concept has a solid basis. With each new research published in the scientific literature, the evidence supporting the health advantages of tea use becomes stronger. *Camellia sinensis*, the tea plant, has been farmed for thousands of years, and its leaves have been used for medical purposes. Tea is a widely consumed beverage across the globe, and its ingredients are being studied for therapeutic purposes. Green tea has been exposed to have cancer-preventive properties in cell culture, animal research, and human studies, which is promising. There's growing evidence that black tea has comparable health benefits.

Tea has also been shown to help prevent a number of serious human disorders, including cardiovascular and metabolic problems. Polyphenolic compounds present in green as well as black tea have been associated to benefits in the prevention of cardiovascular disorders, comprising atherosclerosis as well as coronary heart disease, in numerous studies. Tea consumption is also connected to anti-diabetic, anti-aging, as well as a plethora of other health advantages. The principal polyphenolic compounds contained in green as well as black tea, respectively, are catechins as well as theaflavins, which are responsible for the majority of tea's physiological advantages. The findings of clinical as well as epidemiological studies on the

effects of tea consumption on the preventions of chronic illnesses like cancer and cardiovascular disease, as well as general health promotion, are discussed in this article.

RajjuPriya Soni et al. discussed a review on Tea[9]. After water, tea is the most popular beverage. *Camellia sinensis* leaves are used to make it (family: Theaceae). Oolong, green, black, and Ilex teas are among the many kinds of tea produced, contingent on the region's post-harvested treatments as well as palatability. Tea, which is higher in natural antioxidants, is said to help against malignancies of the colon, esophagus, and lungs, as well as urinary stones and dental cavities. Tea, which has been shown to be anticariogenic, anti-inflammatory, antimicrobial, anti-carcinogenic, as well as anti-oxidant, may be used as a preventative measure.

Sabu M Chacko et al. discussed a review on beneficial effect of green tea[10]. Green tea has been demonstrated to provide health benefits in the treatment of a variety of conditions, including cancer, heart disease, particularly liver disease. Green tea's catechin content, namely (-)-epigallocatechin-3-gallate, is connected to several of its health advantages. In vitro and in animals, the underlying mechanisms of green tea catechins and their biological effects have been explored. Metabolic syndrome, which encompasses obesity, type two diabetes, and cardiovascular risk factors, has also been treated with green tea catechins in human studies. Tea catechins may protect against obesity as well as type two diabetes induced by a high-fat diet, as well as reduce the risk of cardiovascular disease, when consumed over time. Green tea's pharmacological and clinical effects should be monitored, and its mechanisms of action should be elucidated, in accordance with international standards.

### **3. DISCUSSION**

Tea is the most widely consumed beverage on the earth, second only to water. Herbal tea is sometimes mistaken for tea, which is only a marketing trick. Herbal tea, on the other hand, is made from plants other than *Camellia sinensis*. On a routine trip to the grocery store, one may discover a range of tea preparations supplemented with various extracts of mango, strawberry, pomegranate, lemons, as well as other fruits and vegetables, at least in US markets, due to the popularity of tea. As a consequence of these marketing strategies, tea products have gained appeal among non-tea consumers. Tea extracts are also used in cosmetics and other products that are sold to the public.

Nowadays, healthy foods that include active free radical scavengers are extremely popular. Polyphenols, caffeine, and amino acids are the main chemical components of green tea. Tea also includes flavonoids, which are anti-oxidant chemicals with a variety of health benefits. It is generally recognized that some foods' phenolic chemicals may have health advantages. Polyphenols, which are found in tea, have been related to positive benefits on human health. India is one of the world's biggest tea producers, exporters, and consumers. The current study emphasizes on the productions, configuration, as well as health benefits of tea intake.

### **4. CONCLUSION**

Tea have recognized as a Nature's rewards for improving health's of human, according to current study over the past 30 years. The quantity of experimental data pertaining to the characteristics of tea and its components is steadily increasing. As a result, endogenous and external variables that affect the occurrence as well as progressions of many chronic illnesses have been better identified and recognized. Tea has a wide variety of phytochemicals that are digested, absorbed, and extensively metabolized by the body, and the effects of tea components may be felt at the cellular level, according to research. Tea's status as a functional food validates long-held ideas



among tea users. Tea is now being contested as to whether it is beneficial or hazardous to human health.

It is regarded safe and beneficial against many malignancies, cardiovascular disorders, and diabetes mellitus because to its widespread and lengthy usage. However, numerous instances of hepatotoxicity, neurological diseases, and other side effects have been recorded after consuming high quantities or concentration preparations of the *C. sinensis*. Upcoming study should focus on determining the true scope of health advantages, determining the safe range of tea intake related with these profits, as well as elucidating possible mechanisms of the actions. To better understand the impacts of tea on people, new experimental systems must be established. Tea is a popular beverage across the globe, and further research into its usage and polyphenol content is needed to determine its involvement in the primary and secondary prevention of chronic illnesses.

#### REFERENCES:

1. K. Hayat, H. Iqbal, U. Malik, U. Bilal, and S. Mushtaq, "Tea and Its Consumption: Benefits and Risks," *Crit. Rev. Food Sci. Nutr.*, 2015, doi: 10.1080/10408398.2012.678949.
2. W. Wang, Y. Yang, W. Zhang, and W. Wu, "Association of tea consumption and the risk of oral cancer: A meta-analysis," *Oral Oncol.*, 2014, doi: 10.1016/j.oraloncology.2013.12.014.
3. C. W. Pan, Q. Ma, H. P. Sun, Y. Xu, N. Luo, and P. Wang, "Tea consumption and health-related quality of life in older adults," *J. Nutr. Heal. Aging*, 2017, doi: 10.1007/s12603-016-0784-0.
4. Y. J. Gu *et al.*, "Tea consumption is associated with cognitive impairment in older Chinese adults," *Aging Ment. Heal.*, 2018, doi: 10.1080/13607863.2017.1339779.
5. X. Dong *et al.*, "Tea consumption and the risk of depression: A meta-analysis of observational studies," *Aust. N. Z. J. Psychiatry*, 2015, doi: 10.1177/0004867414567759.
6. H. Huang, G. Y. Han, L. P. Jing, Z. Y. Chen, Y. M. Chen, and S. M. Xiao, "Tea consumption is associated with increased bone strength in middle-aged and elderly Chinese women," *J. Nutr. Heal. Aging*, 2018, doi: 10.1007/s12603-017-0898-z.
7. X. Li *et al.*, "Tea consumption and risk of ischaemic heart disease," *Heart*, 2017, doi: 10.1136/heartjnl-2016-310462.
8. N. Khan and H. Mukhtar, "Tea and Health: Studies in Humans," *Curr. Pharm. Des.*, vol. 19, no. 34, pp. 6141–6147, 2013, doi: 10.2174/1381612811319340008.
9. R. P. Soni, M. Katoch, A. Kumar, R. Ladohiya, and P. Verma, "Tea: Production, Composition, Consumption and its Potential as an Antioxidant and Antimicrobial Agent," *Int. J. Food Ferment. Technol.*, vol. 5, no. 2, p. 95, 2015, doi: 10.5958/2277-9396.2016.00002.7.
10. S. M. Chacko, P. T. Thambi, R. Kuttan, and I. Nishigaki, "Beneficial effects of green tea: A literature review," *Chin. Med.*, vol. 5, pp. 1–9, 2010, doi: 10.1186/1749-8546-5-13.