

Health Benefits of Consumption of Black Tea

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ABSTRACT: *Owing to their phytochemical constituents possessing pharmacological values and therapeutic uses, medicinal plants are important components in conventional medicine. Black tea contains thousands of different biological compounds, which have shown many promising pharmacological products. While the molecular evidence of cholesterol lowering and antioxidant effects in humans is growing exponentially, there is still a lack of knowledge on the pharmacological effects of black tea. Therefore, this overview article highlights the expansion of new insight into black tea that could be used as a nutritious food additive in order to fill this knowledge void. The fascinating role of black tea as a herbal medicine is also illuminated in this article, which is the future demand to get rid of artificial healthcare providers in the practise of human health. In addition, this knowledge will be valuable in terms of the low-cost practise of residual-free natural pharmaceutical goods and the natural safety of humans. In addition, more molecular investigations are required to reveal its mechanism of action, especially for the hypocholesterolemic effect of black tea to resolve cardiovascular disease, to reduce symptoms and to be a natural safeguard for human health.*

KEYWORDS: *Antioxidant, Black Tea, Camellia sinensis, Diabetes, Obesity.*

INTRODUCTION

Tea (*Camellia sinensis* L.) is known internationally to be the second most commonly consumed medicinal and flavoured non-alcoholic drink next to water in the present century. According to the study, black tea was 78 percent of the overall amount of tea produced and consumed worldwide, 20 percent was green tea, and yellow or oolong tea was less than 2 percent. Dipping tea leaves into hot water has been supplying tasty beverages followed by the discovery of many medicinal effects since ancient civilizations (5000 years ago). In Western countries and also in different Asian countries, black tea is predominantly used, while green tea is mainly consumed in Japan, China, India, and a few parts of the Middle East and North Africa. There are various additives in black tea, such as flavonoids (catechins, TFs and TRs), phenolic acids (CGA, CA, GA and cauramic acid), methylxanthines (caffeine), amino acids (theanine), sugars, lipids, fats, β -carotene, fluoride volatiles, as well as traces of vitamins C, K, A and folate. Oxidative polymerization and catechin condensation occur during the maceration of green tea leaves, leading to the development of TRs and TFs by peroxidase (PO) and polyphenol oxidase (PO) action (PPO). In addition to a variety of treatment advantages, the TRs and TFs result in a black tea brew colour. The biotransformation of catechins classifies tea into three forms through the processing of tea leaves: green (non-oxidized), black (totally oxidised), and oolong (semi-oxidized). The pharmacological properties of black tea have been linked to its phenolic content by a lot of science evidence. TRs and TFs are the main polyphenols that perform a central role in the management of apoptosis, cell proliferation and ageing of human cancer cell lines as possible antioxidants. Also, in comparison to their medicinal effects, TRs, theanine, and TFs are essential quality components of black tea that contribute to colour and taste. In addition to its impact on health promotion and disease prevention in humans, numerous biological activities have been studied for hundreds of years. In several clinical trials, positive effects on blood pressure (BP) have also been proven. Flavonoids in black tea have been confirmed in another human sample to play an important role in enhancing coronary regulation and assisting

to attenuate endothelial dysfunction, although the latter may be caused by the individual differences in metabolism of flavonoids[1][2].

These day, black tea is attracting significance around the world as an important focus of science for both its medicinal and dietary impact studies. More bio-direct and stable compounds are the major medicinal agents in black tea, such as TRs and TFs, relative to those in other herbal plants. These formulations' ability is so large that their impact are comprehensive. In terms of low cost, no residual effects, simple usability and as a precaution for human beings, this reappraisal will be useful. Furthermore, as a hypocholesterolemic agent, its persuasive ability suggests that it can shield individuals from heart-related disorders that are leading causes of death in human health. This paper reviewed existing literature mostly on field of black tea's phytochemical ingredients, therapeutic uses and medicinal effects to offer new insight into using it as a natural remedy to battle human health-related diseases[3].

LITERATURE REVIEW

Sources and phytochemistry

The primary root of the tea plant (*Camellia sinensis* or *Thea sinensis*) is the Asian, South American, and African countries' tropical and temperate areas. This herb belongs to the Theaceae family. Most of the families of Theaceae originate from China, Sri Lanka, Japan, and India. There is a resemblance between green and black tea in the chemical properties, however the chemical modifications that happen during the manufacturing process (fermentation and processing conditions) contribute to certain variations between black and green tea, oolong and white tea[4].

There are various ingredients in black tea, such as flavonoids (catechins, TFs and TRs), phenolic acids, methylxanthines (caffeine), amino acids (theanine), sugars, lipids, proteins, β -carotene, fluoride volatile compounds, and also vitamin C, K, A and folate traces. Six classes of tea polyphenols, like phenolic acids (PA), flavones, flavonols, anthocyanins, flavanols, and hydroxyl-4 flavanols, are contained in black tea. Ltheanine is the most special amino acid that makes up more than 50 percent of all amino acids in black tea. It was identified in numerous species of the genus *Camellia* and in one type of mushrooms. The deterioration of theanine contributes to the development of the flavour and fragrance of black tea. Certain amino acids, such as alanine and arginine, give bitterness to the tea[5].

Pharmacological and therapeutic properties

Black tea's health advantages include diarrhoea reduction, elevated BP, teeth loss, poor digestion issues with blood supply, low-concentration amounts of high-density lipoprotein (HDL) cholesterol and antioxidants, etc. It is among the most famous teas introduced to individuals and is also known because of its medicinal importance and medical benefits.

Antioxidant and anti-inflammatory

Attributed to the existence of the antioxidant agent (Polyphenols), black tea has a high antioxidant effect and it can neutralise FRs that can impair cells, contributing to disease growth. A variety of studies have shown that TF-3 and TF-4 have potent antioxidant activity in black tea, close to the antioxidant activity of (-)-EGCG in green tea. TFs also play a significant role in inhibiting various cancer forms, inflammation, and clastogenesis. It has also been

documented that the catechins present in tea are potent antioxidant agents and are capable of battling cancers, lowering blood sugar and preventing angiogenesis. In comparison, black tea has been found to possess certain bioactive compounds that have anti-radical capacity. It was reported that the key explanation for its antioxidant capacity is the existence of certain polyphenols such as GA, TRs, and TFs in black tea. There are several environmental causes that create ROS, such as pesticides, cigarette smoke, UV light, herbicides for ionising radiation, various xenobiotics, and large levels of ozone. ROS is produced and during biotransformation of mutagens into pre-carcinogens, that promotes LPO, protein aggregation and damage to DNA. Tumorigenesis and inflammation are linked with IL-6, TNF- alpha, 5-LOX and COX-2. Apoptosis is organised by pro-apoptotic genes, primarily the Bcl-2 family of genes. Black tea polyphenols have a potent antioxidant that scavenges ROS, eliminates enzymes that cause inflammation, and regulates the proliferation of cells by stimulating the expression of apoptotic proteins (Caspases, PARP, and Bax) and thereby stops cancer from occurring. The multiple defensive measures are marked by a harsh headline. Defense of black tea polyphenols in cells towards oxidative stress induced by FRs[6][7].

Diabetes and obesity

Tea drinking has been widely researched for its effect on multiple diabetes-related diseases, and has verified the important capacity of tea to avoid diabetes. A prospective Singapore Chinese Health Research cohort of 36,908 respondents (aged 45-74 years) found that daily black tea intake of around 1 cup per day, but not green tea, significantly decreased type 2 diabetes risk factors (NIDDM) in Asian males and females in Singapore. It is stated in another report that the activity of polyphenols in black tea can mitigate the danger of experiencing NIDDM. Whereas in diabetic patients, 2-4 cups a day consumption was linked to increased biomarkers of oxidative stress, including lowered serum C-reactive protein (CRP) and MDA levels. In Sri Lanka, physicians have suggested the heavy intake (6-10 cups/day) of black tea (tea grade comprising medium-sized leaf particles) from Sri Lankan Broken Orange Pekoe Fanning to pre-diabetic and moderate diabetic patients on the basis of its hypoglycemic and anti-diabetic practises. Black tea TF enhances the insulin/glucose ratio resulting in enhanced insulin action, and also black tea polyphenols have insulinomimetic activity resulting in blood glucose level suppression. Obesity, like diabetes, is considered to be the most significant etiological factor for CVD growth. Epidemiological tests have demonstrated that black tea has substantial ability in both aged and overweight participants to reduce the amount of blood glucose, body weight and body mass index (BMI). Moderate data suggests that black tea in obesity and also non-obese subjects lowers body weight[8].

GIT and antimicrobial

It is understood that non-steroidal anti-inflammatory drugs (NSAIDs) cause multiple gastric issues, including ulceration of the stomach. As a common medicine to treat certain gastrointestinal tract (GIT) diseases, medicinal herbs and herbs, such as those belonging to the genus Theaceae, are used. Black tea has been reported to enhance oral and stomach ulcerations because of its considerable ability. It is recognised that helicobacter pylori causes 80 per cent of gastric ulcers. The effective actions of black tea towards Helicobacter pylori infection have been suggested in epidemiological and laboratory-based research. Significant data suggests that gargling with black tea has a prophylactic effect on the disease of Haemophilus influenzae. The urease enzyme for the transformation of urea into ammonia was inactivated by tea

polyphenols, that prevents the bacterial species from digestion by gastric juice resulting from the suppression of stomach bacteria. After intake of Swiss cheese fondue, black tea is also considered to enhance appetite by enhancing gastric emptying[9].

Asthma and allergy

The trend towards the accumulation of data showing the possible antihistamine influence of black tea is growing. Histamine is a biologically active agent that is generated in allergic reactions, involving inflammation, urticaria, mastocytosis, asthma and dermatitis, from sensitised mast cells. Apart from its anti-inflammatory effects, tea extract has demonstrated antihistamine activity in murine peritoneal mast cells (PMCs) and hinders the action of hyaluronidase. Histamine synthesis was inhibited by tea polyphenols in murine cell culture by up to 90 percent. Black tea includes 54%-71% of quercetin-type flavonol glycosides, which have been identified as a possible therapeutic agent towards asthma for powerful antihistaminic and anti-inflammatory effects[10].

CONCLUSION

Since prehistoric times, black tea has acquired considerable value due to its enticing ethnomedicinal principles and a beloved herbal remedy. A variety of favourable qualities of black tea have now been clinically established, and it may be prudent to promote daily drinking as an alternative to other drinks. Clinical study on black tea properties in humans remains restricted; future research studies are necessary to illustrate the appropriate amount of tea intake that has optimum health benefits, but there is still not well understood mechanism for some of these effects in various organisms. This unlocks the scientist's potential doors to further discussion on these challenging fields in order to find and log accountable biomarkers and molecular markers that are responsible for a wide variety of advantages for black tea. Moreover, additional experiments at the cellular scale need to expose the mode of action of black tea's hypocholesterolemic impact in order to resolve cardiovascular disease in the world population.

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