GREEN TEA: A REVIEW ON THERAPEUTICS BENEFITS AND ITS ROLE IN DAILY LIFE

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ABSTRACT

Tea is a very ancient and popular beverage used since history and loved by all. In fact it is so popular that various forms are available as daily consumed by many. Over the past few decades the scientists have taken a deeper look into the constituents, health benefits and the drawbacks of consuming tea. In this review we have focused on the health benefits and drawbacks of consuming green tea. In the recent years many researches have been carried out proving that green tea is a good source of boosting immunity, lowering the cholesterol levels, decreasing cardiac disorders and also lowering the risks of cancer and blood sugar levels. We have also listed the constituents and the latest research data's available according to the recent databases.

KEYWORDS: LDL, Cholestrol, fasting sugar, epigallocatechin gallate (EGCG), neuroprotective, Alzheimer's disease.

INTRODUCTION

Tea is generally consumed as green tea or black tea with or without adding milk to it. Green tea is derived from the plant leaves *Camellia Sinensis* a small plant which grows mainly in China and south east Asia. Tea is consumed worldwide and cultivated in approximately 30 countries. Tea is considered second in consumption after water worldwide. Green tea is mainly consumed in regions like China, Japan, India, Middle East, North Africa while Black tea is consumed predominantly consumed in western and Asian countries.[1]

Green Tea is a treasure from nature to the manking as is consumed majorly by the population.[2]

Since many years the health benefits after consuming green tea like cardiovascular diseases, prevention of cancer, neuroprotective activity, lowering cholesterol levels, antibacterial activity, anti oxidant activity, anti viral, lowering of blood glucose levels have been been studied and reported. However some side effects are reported if green tea is consumed regularly at regular intervals.[3]

In researches it is found that the Black tea is useful for reducing heart diseases and stroke when consumed three or more cups per day regularly.[4-8]

As the cultivation of tea requires a humid climate provinces like southern part of China mainland, Northern India slopes, Sri Lanka, Tibet are ideal growing area of tea.[9]

Tea catechins and polyphenols are helpful for scavenging the reactive oxygen species in vitro and may also work as antioxidants through their enzyme activities and transcription factors.[10]

Chemical Constitutents

The major constituent of green tea is Catechin which are potent flavonoids and serve as best dietary source of antioxidants. The flavonoids are abundantly present in fruits, vegetables, green plants and have a large group of phenolic compound. Flavonoids have gained lot of importance for their antioxidant property.[11] Various catechins are also present in green tea namingly epigallocatechin (EGC), epicatechin (EC), epicatechin gallate (ECG) and epigallocatechin gallate (EGCG).[12]

The other components reported in green tea are theanine, theoflavins, theophylline, phenolic acids, gallic acid, caffeine. EGCG is the most important catechin which accounts for 65% of the catechin present in green tea and alos seems to make the green tea an important cup

providing health benefits. An average of 100-200 mg of EGCG is present in one cup of green tea.[14]

Figure: Principle components of green tea[13]

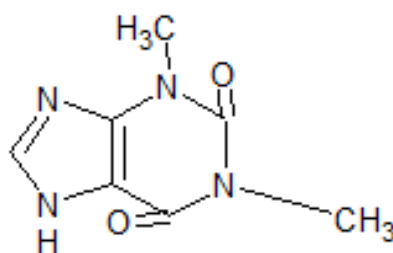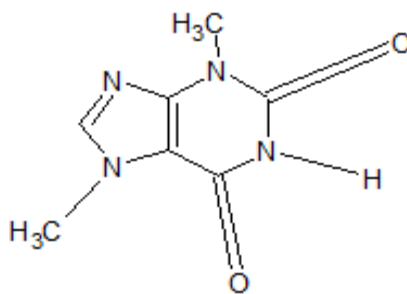| Components	Green Tea (%weight of extracted solids)
Catechins	30-42
Flavonols	5-10
Other flavonoids	2-4
Theogallin	2-3
Other depsides	1
Ascorbic Acid	1-2
Gallic Acid	0.5
Quinic acid	2
Theanine	4-6
Methylxanthines	7-9
Minerals	6-8
Other organic acids	4-5
Carbohydrates	10-15
Other amino acids	4-6
Volatiles	0.02

Constituents of Green Tea.
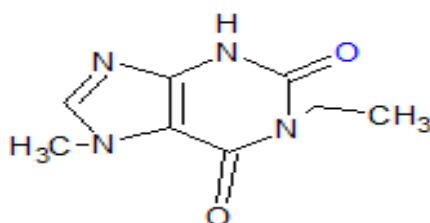
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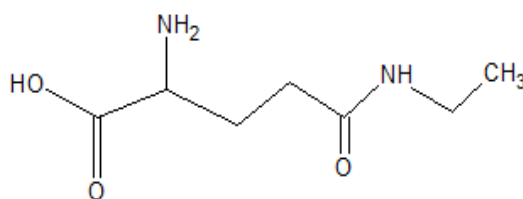
THEANINE

THEOPHYLLINE

THEOBROMINE

Therapeutic Importance of Green Tea

Cardiovascular Diseases

Consumption of green tea have reportedly reduced the risk of cardiovascular disorder. The green tea catechins are antioxidants which reduce free radicals present in body as well as preventing the oxidation of LDL cholesterol. Sequentially the prevention of oxidation of LDL particles occurs and they inhibit the atherosclerotic plaque formation. Thus consuming green tea is believed to be important in lowering the risk of heart diseases.[14]

Cancer

The catechins also act as powerful inhibitors of cancer in many was. They act as anti cancer agents by scavenging the oxidants before the reactive radicals cause an cell injury inside the body. The catechins further act by reducing incidence of formation of tumors as well as controlling the size of chemically induced tumor cells.

Green tea have been considered as a potential agent to reduce the risk if cancer by NCI (National Cancer Institute) and they have funded in the extensive research for this activity of green tea.

A study is being carried by NCI which involves the role of Ployphenone (decaffeinated green tea extract) is uder Phase 2 trials.[15]

Tea may also also help in promoting apoptosis or programmed cell death[16] and thus stopping any cell division thus decreasing abnormal growth of cells.[17]

Diabetes

Recent USFDA have reviwed the effect of green tea on insulin sensitivity and analysed the risk factor reduction for diabetes. The epidemiological studies have suggested that there is a relation between consumption of tea and decreased the risk of type 2 diabetes. Various

researches have shown that tea components improved the control of glucose metabolism and endothelial function.[18]

Cholestrol Levels

Research team from USDA (United States Department of Agriculture) have studied the effect of fifteen hypercholesterolemic adults participants which were given a specified type of diet low in fat and cholesterol as specified by the American Heart Association and National Cholesterol Education Program . When assessed after three weeks, researches found that five servings of black and green tea per day it reduced the LDL*(Bad cholesterol) by 11.1 percent and total cholesterol TC by 6.5 percent when compared to placebo beverages.[19]

Neurological Diseases

In a research carried out by Japanese researchers it was reported that theanine, the amino acid present majorly in tea may help in preventing memory loss as people age and decrease neuronal cell death. In their study they provided animals theanine and subjected them to repeatedly memory impairment now the animals which received theanine faced lesser memory damage as compared to the one who did not received green tea.[20]

Tea and Blood Sugar Control

In a randomized controlled trial carried out including 22 studies and 1,584 people it was found that green tea catechins (with or without caffeine) reported a decrease in fasting blood glucose.[21]

Thus green tea is found to be effective for people who are diabetics.

Immunity and role of Tea

Green tea also helps to boost immunity and can be used as a daily beverage for building up immune levels. In a recent research conducted by Brigham, Women's hospital, Harvard university green tea contains a component which helps body to protect from infection and diseases thus strengthening immunity.[22]

Negative effects reported

Those people who regularly consume green tea have shown a stained tooth problem. This is due to the presence of polyphenols. When two or three cups of green tea per day was consumed by people (240-320 mg polyphenols) or 100-750 mg per day of standard green extract given to people tooth staining is observed.[24]

Clinical Observational Data

A study conducted on 30,000 finnish adults of age group between 25-74 year old whose follow up was taken for 13 years it was reported that tea drinking is related to reduced risk of Parkinson's disease. Thus it is concluded that those who drink green tea regularly three or more cups per day were 69% less likely to show Parkinson's disease as compared to the people who didnot drink tea.[25]

In a study carried for more than 74,000 subjects that were given green tea as a beverage daily for ten years, the people who consumed green tea are less likely for stroke as compared to the one who did not consumed green tea.

During the research work approximately 4,089 cases of heart stroke were recorded then they were divided into two groups, those who consumed four or more cups daily had 21 percent reduced risk of stroke when administered green tea as compared to the other group who did not drink tea.[26]

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