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Benefits Of Green Tea As Nutraceutical

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Abstract: - Nutraceuticals are products, nutrition is also used as medicine. Green tea is mostly available in antioxidants compared to other forms of tea. Green tea obtained from *Camellia sinensis* leaves is a common beverage with enormous medicinal importance. Green Tea as a nutraceutical is a dietary supplement used to reduce the risk of several diseases according to various *in vitro* and animal studies and clinical trials. Green tea extract contains several polyphenolic components such as benefits as a coronary heart disease, hypertension, non-insulin dependent diabetes, pulmonary dysfunction, osteoarthritis and Prevention of various cancer diseases polyphenolic components such as benefits as a cancer prevention, ameliorate of diabetes side effects, cardiovascular safety, cognitive boost, promotion of weight loss skin care, allergy suppression, protection from osteoarthritis, prebiotic etc. Green Tea is used in different areas of the world as green, black, or Oolong tea. The predominant active component is the flavanol monomers known as catechins epigallocatechin gallate (EGCG) & Epigallocatechin (EGC). It can be prepared as a drink which can have many systemic health effects or an extract can be made from the leave to use as medicine. The aim of these literature review found nutraceuticals use of Green Tea and its Benefits in Various Diseases.

Table1: Words and Definition

Words	Definition
1]Green Tea: -	It is Obtained from the Tea plant <i>Camellia sinensis</i> belong to the family <i>theaceae</i>
2] Nutraceuticals: -	It can be defined as nutrient which in addition to its nutrient values provides health benefits including promotion of health & prevention of disease

Key words: – green tea, nutraceuticals, Cardio protection, anti-inflammation

Introduction: -Green tea [*Camellia sinensis*] is one of the most common globally consumed beverages.^[11] *Camellia sinensis* is the species of plant whose leave & leaf buds are used to produce Chinese tea.^[7]

It is of the genus *Camellia*, a genus of flowering plant in the family *theaceae* green tea is a non-fermented tea & contains more catechins than black tea. The flavonoids in green tea are the catechins, epicatechin [EC], epigallocatechin [EGC] & epigallocatechin gallate [EGCG].^[3,10] the concentration of total polyphenols in dried green tea is ~ 8-12% other compounds of interest in dried green tea leave include gallic acid quercetin, kaempferol, reciting, caffeic acid & chlorogenic acid.

There are various types of green tea that are classified according to their taste and antioxidant properties. Green tea may exert the prevention effect in various cancers including lung, oesophagus, stomach, international, pancreatic, breast, prostate or, bladder, cancers. ^[26,27] In Ayurveda system, unani system practitioners used green tea as a stimulant, diuretic & astringent. ^[11]

A many foods product consumes green tea such as ice creams pastry, waffle, cake, chocolate, noodles etc. The catechins contains [-]-epigallocatechin-3-gallate [EGCG], [-] epicatechin-3-gallate [ECG], [-]-epigallocatechin [EGC] & [-]-epicatechin [EC]. ^[1] the world of nutraceutical was derived from nutrition & pharmaceutical. ^[6] The nutraceutical was defined as food or part of food that gives pharmacological health benefit or medicinal benefits including prevention & treatment of diseases. ^[6] Green tea as nutraceutical by demanding its pharmacological effect of antioxidant, anticancer properties.

History of green tea.

1] Green tea has been a popular beverage for thousands of year & was originally grown in China dating back 5001 years.

2] Green tea have remained popular beverages in Asia since

3] Tea was introduced to the western culture in the 6th century by Turkish traders.

4] Second to water, tea is now considered to be the world's most popular beverage

World tea production of green tea has passed from 3.15 million tons in 2003 to 3.6 million tons in 2006. ^[4]

Common name: -green tea

Other name: -Chinese tea, camellia tea, Gruner tea Matsu-cha

Botanical name: -camellia sinensis

Family: -theaceae

Plant part used: - leaf



“Fig.1”: Camellia Sinesis Plant



“Fig.2”: Camellia Sinesis Leaves

Description: - it's today grown in a tropical & subtropical region ^[8] It is an evergreen shrub that is usually trimmed too below a strong taproot. The flowers are yellow, white, 2.5 to 4cm in diameter, with 7 to 8 petals. ^[8] The seeds of camellia sinensis & camellia oleifera can be pressed to yield oil. ^[8] It is an essential oil that is used for medical & cosmetic purposes & originates from the leaves of different plants. ^[8]

Green Tea Composition:

Compound	Green tea (%)	Black tea (%)
Catechins (phenolic compounds)*	30	5
Oxidized phenolic compounds	0	25
Proteins	15	15
Amino acids	4	4
Fiber	26	26
Carbohydrates	7	7
Lipids	7	7
Pigments	2	2
Minerals	5	5

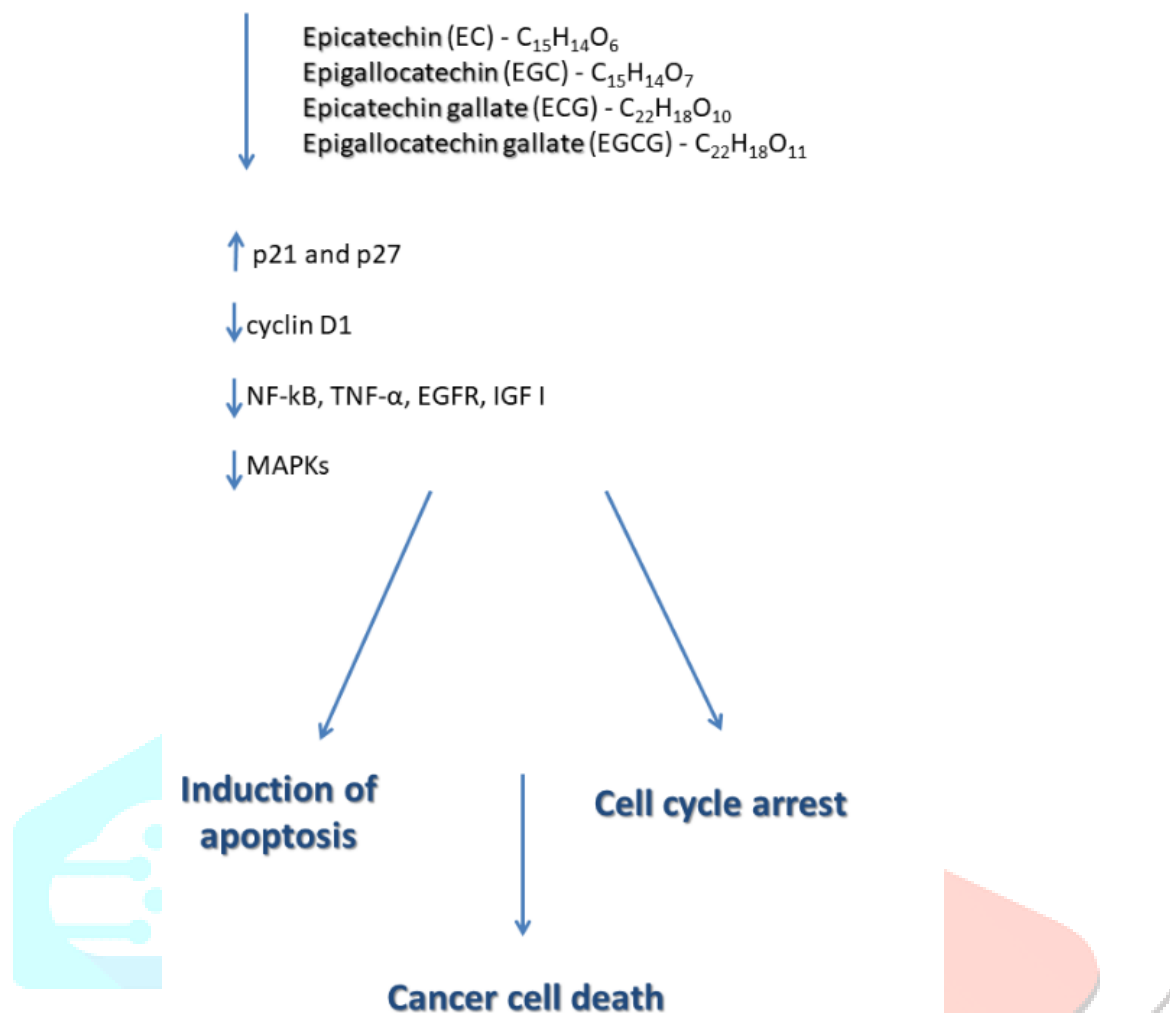
*The catechins comprise at least four major phenolic compounds, epigallocatechin, epicatechin gallate, epigallocatechin gallate and epicatechin (see FIGURE 2 for their structures).

“Fig.3”:Composition of Tea**Catechin mode of action:**

1. The amount of catechins in green tea depends on its variety, the method of its cultivation, & processing & its drying time or temperature.^[3]
2. Available data indicates antitumor, antioxidant, anti-inflammatory, anti-microbial, anti-diabetic, anti-obesity & hypotensive effects of catechin.^[3]

It also acts as the metal ion chelator.^[3] Catechins as well as other active ingredients derived from green tea. It can also repair DNA damage caused by UV radiation. The available data show that the high effectiveness of green tea ingredients in order to prevent UV radiation damage to the skin.^[28]

Green tea catechins



“Fig.4”: Summary of molecular signaling pathways of green tea catechin.

Route of administrations & oral route of administration: -

1. It's a use as a beverage product.
2. Topical route: - when apply skin to use topical route.

Chemistry: - 1 The main constituents of green tea leaves are polyphenols. The fresh tea leaves contain Caffeine of 3.5% of the total dry weight, Theobroma [0.15-0.2%.], theophylline (0.02-0.04%) & other methylxanthines, lignin (6.5%), Organic acids (1.5%), chlorophyll (0.5) & other pigments, theanine (4%) & free amino acid (1.5-5%) & numerous flavour compounds^[1]

Amino acid	Carbohydrates	Volatile compounds	Lipids	Vitamins
L-theanine	Glucose	alcohol	Linoleic acid	Vitamin A
Tryptophan	Cellulose	esters	α -linolenic acids	Vitamin B2
Threonine-5-N-ethyl-glutamine	Sucrose	hydrocarbon		Vitamin B3
Glutamic acid				Vitamin C
Serine				Vitamin E
Valine				Vitamin k
Leucine				
Aspartic acid				
Lysine				

“Fig.5”: Chemical Composition of Green Tea

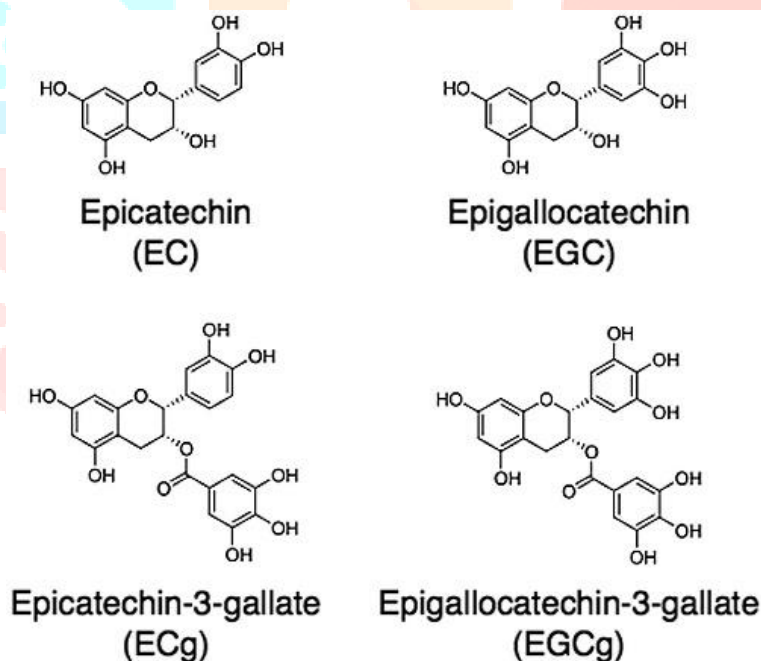
It is also containing trace elements such as magnesium, chromium, manganese, Calcium, Copper, zinc, iron, selenium, Sodium, cobalt's & nickel^[28]

In addition, green tea is rich in sterols & lipid linoleic & alpha-linolenic acid, & vitamins B2, B3, which the most is in Gyokuro tea & Sencha Vitamin E & trace amounts of vitamin K. ^[3] It is also important that green tea is extremely rich in macro-elements It is a source of green tea is extreme fluorine, Sodium as well as phosphorus.

The diphenyl propanoid skeleton content is also typical feature of green tea. Green tea has a protein content of about 15-20% which include amino acids such as L-theanine, tryptophan, threonine, 5-N-ethylglutamine, glutamic acid, Serine, glycine, valine, & arginine^[3]

In addition, green tea is rich in xanthine bases, which include theophylline & caffeine, as well as pigments such as carotenoids & chlorophyll^[3] The chemical composition of greens tea also includes phenolic acids include that gallic acids & volatile compounds, in that include alcohols, esters, hydrocarbons, & aldehydes. phenolic acids which include proanthocyanin, gallic acid esters with monosaccharides, have a huge impact qualities of green tea infusion. The green tea belonging to family catechins contain of flavonoids the catechin contain two benzene rings referred to as the A-B Brings^[1]

Catechin molecules contain a dihydropyron heterocycle that has a hydroxyl group on carbon 3. thus, the A ring is similar to a resorcinol moiety whereas B-ring is similar to a catechol moiety. The catechin molecule has two chiral centres carbons 2 & 3. Therefore, it has four diastereoisomers with two of the isomers are in trans Configuration & two are cis configuration The Catechin & epicatechin are having trans & cis isomers. the structure of chemical related to antioxidant activity appears that including ortho-3,4 dihydroxyl group or 3'4'5'trihydroxyl group in B ring^[1] The ring A & C in gallate group at the position 5 & 7 & the C ring located at position 3.



“Fig.6”: Green tea contains a much higher amount of catechins

Available data indicate that this compound can constitute up to 30% of dry matter of green tea.^[3] The extracts of immature tea leaves are rich in flavanols & their gallic acid derivatives. Arrange of natural such as green tea flavour components such as terpenes, Sesquiterpenes, & organic acids.

It also contains many other constituents such as, tannin, diphenylamine, oxalic acid, trace elements & Vitamins. The stability of green tea catechin depends on the pH & temperature in acidic medium PH has greater than 4 In alkaline mediums pH has smaller than 8 Available data indicate that ascorbic acid, arginine, proline, lysine & EGCG reported to have a positive effect on tumour growth reduction.

How to obtain green tea?

The green tea freshly harvested tea leaves are steamed at high temperatures & dried to deactivate the polyphenol oxidases & as a result, preventing the oxidation of Catechins & maintaining the polyphenols in the monomeric forms. In this process. In addition to preventing polyphenol oxidation^[1]

In a steaming process. It is also protected against enzymatic degradation of vitamins. The method of separation, purifications, Concentration & drying process, highly concentration -green tea catechin extract with low flavour intensity can be produced^[1]

Health - Promoting properties of green tea: -

In particular flavanols, vivo & in vitro elements, clinical studies confirm their antioxidant & anti-inflammatory effects^[3] Catechins are the dominant polyphenols in green tea, they have antioxidant activities result from the neutralization of free nitrogen & oxygen radicals. As they are ability reaction, chelate metal ions in redox reactions

In scientist studies indicates the antitumour effect of polyphenols contained in green tea leaves due to inhibition of cell divisions as well as the induction of phase II antioxidant enzymes, e.g., Superoxide, dismutase, glutathione-S-transferase as well as glutathione-peroxidase & reductase^[3]

The study showed that consumptions of greens tea within 4 months in an amount of four glasses per day reduced urinary levels of 8-hydroxy deoxyguanosine. In scientific studies describes the effects of green tea polyphenols on inhibitions of the growth of cancer cell & reduction of the risk of cancer. They described prostate, pancreatic, breast & stomach cancers in the field scientific study. It is said that green tea may support chemotherapeutic as well as preventive effects. therefore, it cannot be replacing pharmacological treatment. It is able to induce cancer cell death while not affecting healthy cells. The result concerns the research on the effects of polyphenols on oxidative stress in vivo. The technology of processing green tea leave has making tea have a different effect & has other biologically active ingredients & health Promoting properties^[26]

Pharmacology of green tea: -

Route of administration: -

(1) **the oral route of administration:** -It is a use as beverage products. Example-green tea is used oral preparation to reduce plaque & improve gingival health.

(2) **Topical route** - when topical route apply skin to use^[23]

Example-green tea has been found to have Significant antioxidant activity Protect against sunburn When applied topically.

Adverse reaction: - When large amount of green tea as consumed due to CNS stimulation & diuresis is possible. One clinical study found that the green tea tablets were taken daily for its months^[24]

Significant interactions: - Controlled studies are not available green tea, it is based on evidence of pharmacological activity. Therefore, clinical significance is unknown^[24]

Adverse reactions: - Excessive intake of green tea will increase there for show adverse effect due to caffeine content. Therefore, green tea is not recommended for people with hypertension, Cardiac arrhythmia, severe liver diseases, anxiety disorder.

In vivo & In vitro study of green tea: -

Green tea exaction & EGCG have been shown in vivo, to reduce food intake, lipid absorption blood triacylglycerides in hyper lipidemic animal models. It has stimulating energy expenditure fat oxidation & faecal lipid excretion is increasing high density lipoprotein (HDL) levels. In vitro they were able to inhibit adipocyte differentiation & proliferation^[4] the combination of EGCG & CAF synergistically interacted with norepinephrine to simulate the thermogenesis of brown adipose tissue. EGCG related point- It also regulates the activity of various enzymes related to lipid anabolism & Catabolism, i.e., Acetyl - Carboxylase fatty acid Synthase pancreatic lipase, & lipoxygenase.

It also reduces serum. It also insulin induced increase in a cell membrane^[4] as a study of oral pathos in vitro & in vivo test. It has identified strong antibacterial activity against a range of oral pathogen, such as Streptococcus mutants, S. Salivations & E Goli.^[24]

In antiviral activity of green tea, as in three vitro studies have been shown that epi gallo catechine gallate strongly inhibits HIV replication. As a several in vitro studies have been shown a dose- dependent decreased proliferations or increase apoptosis in a variety of cancer cell lines.^[24]

The thermogenic activity of green tea, as in vivo study has shown that stimulation of brown adipose tissue thermogenesis occurs to a greater extent than would be expected from the caffeine content alone. More than 150. In vitro & in vivo studies have been reported the benefits of green tea for skin.

Nutraceutical use of green tea:

1. The main aim of nutraceutical products is on improving health & reducing disease risks, through prevention. Nutraceutical are used in the medicinal form of pills, capsules & clearly rounder physiological benefits. Green tea has a nutraceutical product due to its anti-microbial,

Immuno-stimulatory, anti-Carcinogenic, & anti-inflammatory activities. Green tea has a its protective effect against tea metabolic the content of green tea has EGCG. The EGCG have tumorin vasion & angiogenesis inhibiting capacity.

1) They are block activity of matrix - metalloprotein are & the formation of active MMP-2,^[4]

2) Suppress VE- cadherin & Akt phosphorylation. They have inhibited VEGF receptors on endothelial cells.^[4]

3) They have inhibited VEGF & TL-8 release from keratinocytes. They are decrease cjun & Ets1.^[4]

Green tea is prevention diabetes type 2. In. Consumption seems to be mediated by mechanisms such as decreased Carbohydrate absorption & hepatic glucose production. however, it increases insulin secretion & insulin sensitivity as well as uptakes glucose into skeletal muscles.

GREEN TEA USE AS A MOUTH WASH -:

India features a rich source of herbal plant products with medicinal value. Green tea is often used as adjuvant to oral hygiene maintenance with a goal on the prevalence of periodontal diseases thanks to its antibacterial and antioxidant properties.^[29] bacterial plaque is that the major etiologic agent for the initiation of gingivitis. disease can reach periodontitis which if left untreated may eventually compromise the whole periodontium. The most abundant components in tea are phosphoenol especially, flavonoids like the catechins.^[30] Major catechins found in tea are epicatechin gallate (ECG), epicatechin (EC), epigallocatechin (EGC), and EGC gallate (EGCG). Mouthwashes were equally effective in reducing plaque and gingival inflammation, considering the very fact that the chemical formulations of commercially available mouth rinses are synthetic and have considerable side effects, which restricts their use.

Green tea is containing compounds that appear to regulate inflammation and fight bacterial infection. This drink is additionally rich in antioxidants, which have many health properties.

EFFECT ON LIVER:

The liver is one of the key metabolic organs involved in the synthesis and degradation of key biological molecules such as carbohydrate, protein and lipids among others.^[25] In recent decades, we've also seen a growing disease burden from liver diseases like hepatoma (HCC), liver disease, and liver cirrhosis. Notably, primary hepatic malignancies of which HCC is that the most prevalent is that the third leading explanation for cancer-related deaths and therefore the sixth Most common cancer worldwide. Green tea is known for its healthy antioxidants. And it is easy to seek out Concentrated levels of tea extract are available in additional than 100 over-the-counter products. But tea extract was linked to serious liver damage in some people. As a result, those with disease should stand back from the supplements.

There are many reports on the reduction of disease with tea consumption. Green tea intake is related to decreased risk of HCC, liver disease is, hepatitis, liver cirrhosis and chronic disease. There is a big protective effect of tea drinking on liver diseases.

Long-term consumption of tea catechins might be beneficial against high-fat diet-induced obesity and sort II diabetes and will reduce the danger of coronary disease.^[25]

Effect on Blood Pressure:

The effect of tea including antioxidation and vasodilation on BP has been investigated in large quantities of observational studies and trials for several years. Metanalyses based on observational studies indicated the significant inverse relationship between GT and cardiovascular diseases including stroke, myocardial infarction and coronary artery disease.^[25] Well-established evidence corroborates that obesity is one among the foremost important risk factors for the event of hypertension and increases the cardiovascular morbidity and mortality related to hypertension. In human subjects, on the other hand, while evidence from observational studies suggested a significant inverse relationship between GT intake and cardiovascular diseases systematic reviews or meta-analyses of randomized controlled trials (RCTs) reported an inconclusive effect of GT on BP. Tea is one among the foremost commonly consumed beverages, in various amounts in several countries. Green tea (GT) is rich in antioxidant polyphenols similar catechins and flavanols and thus the extract of tea has been shown to possess a vasodilator effect,^{8–10} both of which lead to benefits on cardiovascular health.^[10] The physiological effect of GT on the danger factors for disorder, including vital sign (BP), is therefore promising and of interest.

Several findings on cardioprotective role of green tea have accumulated in recent times. Feng et al. studied the therapeutic role of green tea in boosting heart muscle contraction. Even nanomolar concentrations of EGCG could significantly enhance the contractility of intact murine myocytes by increasing electrically-evoked Ca²⁺ transients, sarcoplasmic reticulum Ca²⁺ content and ryanodine receptor type 2 channel open probability. Dyslipidemia leads to risks of heart attacks. Bornhoeft et al. studied the role of green tea polyphenols in imparting antioxidative and anti-inflammatory properties for a healthy heart. Green tea extract (Polyphenol ®) E when fortified at a dose of 0.2% in the diet reduced cardiovascular risk factors, including high blood cholesterol, inflammation, adiposity and oxidative stress in rats fed on high-fat diet and dextran sodium sulphate.^[11] The increased serum total cholesterol, low-density lipoprotein (LDL), C-reactive proteins and markers of liver toxicity and decreased high-density lipoprotein (HDL) caused by the diet were reversed and normal condition was restored. Sasaki et al. studied the effect of green tea catechins on the contraction of heart muscle.^[11]

Effect of Skin Care: -

Subramaniam et al. determined the in vitro effect of aqueous, methanol and ethanol extracts of tea on the expansion of Streptococcus mutants. Agar plate assay followed by statistical analysis revealed the inhibitory role of tea as shown by the zone of MIC. Fukazawa et al. developed a cell-based, microplate colorimetric screen for anti-hepatitis C virus (HCV) drugs. The anti-HCV property of a plant flavonoid EGCG was observed which founded to block the HCV entry.^[11] Sharma et al. studied the consequences of aqueous tea leaf extract on skin pathogens, namely, Staphylococcus epidermidis, Micrococcus luteus, Brevibacterium linens, Pseudomonas fluorescens and Bacillus subtilis.

Results of the disc diffusion assay showed selective toxicity of the aqueous extract towards the pathogens up to a degree of 500 µg/mL and inhibition of their adhesion to Vero cells at MIC values.^[11]

Vodnar studied the incorporation of tea extracts in chitosan-coated films and its inhibitory impact on pathogen Listeria monocytogenes. The 4% tea extract demonstrated the simplest result. Antimicrobial packaging films often developed using tea extracts to enhance the microbiological safety and quality of ham steak during room and refrigerated storage. Kim et al. test the therapeutic potential of tea on atopic eczema employing a Malassezia multiplex detection kit for 3 times per week for a period of 4 weeks. After the treatment, all the patients showed marked improvement on the mean SCORAD and significant decrease within the mean values of serum eosinophil counts. Bath therapy with tea extract seems to be an efficient, safe, and non-steroidal treatment of patients with atopic eczema related to Malassezia sympodialis.^[11, 25]

Oyetakinawhite et al. reviewed the importance of tea polyphenols in avoiding the adverse effects of environmental, chemical and genotoxic agents on skin health. It's emphasized that the polyphenols endowed with antioxidant, chemo-preventive, and immunomodulatory effects can keep the skin health intact. Reygaert and Jusuf reported that EGC has antimicrobial effects on E. coli strains isolated from tract infections. Mankovskaia et al. compared the Streptococcus mutant's inhibitory activity of EGCG and antimicrobial agent chlorhexidine (both incorporated into dental resins). Both the impregnated-resins showed significant inhibition of bacterial growth at the concentrations tested mutant's survival at A level almost like chlorhexidine.^[11]



“Fig.7”: Effect of Green Tea in Skin and Hair

Benefits Skin Care of Green Tea

1. Protects against skin cancer

Green tea contains polyphenols and trace element, polyphenol containing differing kinds of catechins, with epigallocatechin gallate (EGCG) and epicatechin gallate (ECG) having the foremost potency. These compounds have antioxidant properties. Antioxidants are molecules that have the facility to fight free radicals within the body. Free radicals are compounds which can harm your body, your health, and your skin if their levels get too high. they were cause cellular damage, and are linked to several diseases, including cancer.

According the antioxidant power of EGCG (epigallocatechingallete) could help repair DNA damage caused by ultraviolet (UV) rays from the sun. This can help protect you from nonmelanoma carcinoma .

2. Fights premature aging

It has Study to showed that the antioxidant EGCG, which is abundant in tea. it has the facility to rejuvenate dying skin cells. EGCG are protecting and repairing your cells, this antioxidant can combat signs of aging and make dull skin look healthier.

The vitamins in tea, especially vitamin B-2, can also keep your skin looking younger. Vitamin B-2 has the facility to require care of collagen levels, which can improve the firmness of your skin.

3. Reduces redness and irritation

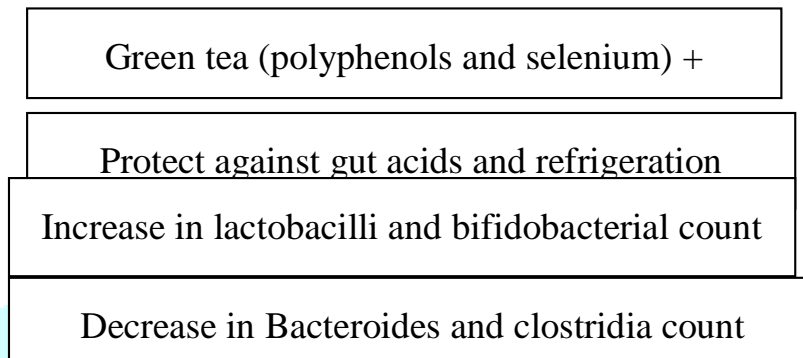
Green tea also has anti-inflammatory properties Trusted Source. This is thanks to the tea’s high content of polyphenols.

Green tea is anti-inflammatory properties can help reduce skin irritation, skin redness, and swelling. It is applying green tea to your skin can soothe minor cuts and sunburn, too.

it is anti-inflammatory properties of green tea studies Trusted Source. It has also found topical green tea to be an effective remedy for many dermatological conditions. It can smooth irritation and itching caused by psoriasis, dermatitis, and rosacea, and it is going to even be helpful for treating keloids.

Effect of Prebiotic Potential

When rats were fed with selenium-containing green tea extract for 6 days, it caused significant increase in caecal counts of lactobacilli and bifidobacterial while decreasing the counts of Bacteroides and clostridial bacteria. The prebiotic activity was attributed to the selenium content of the extract Vodnar and Socaciu observed the effect of green tea on survival of probiotic bacteria *Bifidobacterium infantis* and *Bifidobacterium breve*^[11] Results showed that 5% and 10% green tea co-encapsulated with *B. infantis* or *B. breve* exert a protective effect on bacteria. The polyphenols in the tea are presumed to be the factors shielding the probiotics against gastrointestinal conditions and refrigeration. Axling *et al.* observed that C57BL/6J mice fed with *Lactobacillus plantarum* and green tea group had significantly more *Lactobacillus* and higher diversity of bacteria in the intestine compared to control group^[11]



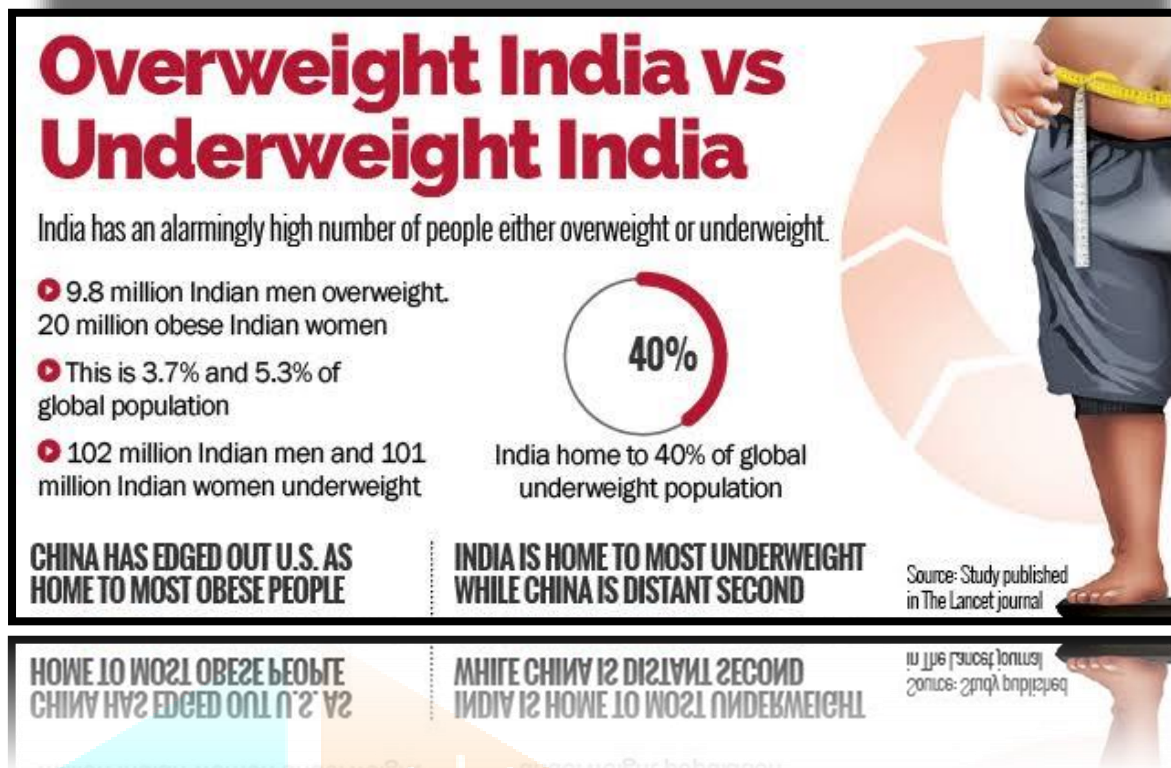
“Fig.8”: As shows the prebiotic benefits offered by green tea.

EFFECT ON OBESITY:

Obesity and fat are fleetly growing, honored medical problem in developed countries and is a trouble to the health of large number of populations. Obesity is a major factor in a number of conditions, including coronary heart conditions, hypertension, non – insulin dependent diabetes, pulmonary dysfunction, osteoarthritis, and certain types of cancer Tea catechins, especially EGCG, appear to have anti rotundity and antidiabetic goods. The goods of tea on rotundity and diabetes have entered adding attention. Tea catechins, Especially EGCG, appear to have anti rotundity and anti diabetic goods. Green tea is also seen as a natural condiment that can enhance energy expenditure and fat oxidation and thereby induce weight loss. The goods of tea on rotundity and diabetes have entered adding attention. Tea catechins, especially EGCG, appear to have anti-obesity and antidiabetic goods.

It studied the effect of green tea excerpt in reducing the body fat and the threat of rotundity related conditions on zebra fish model. Decline in obesity is assumed to be due to revision in the expression of lipid catabolism genes, increase in hepatic expression of these genes and drop in suppressor of cytokine signaling 3b. The pi-class glutathione S-transferase offers defense against Carcinogens and electrophilic composites. Protagonist hypermethylation compromises the exertion and onset of mortal prostate cancer occurs. Silencing of GSTP1 are increasing generation of reactive oxygen species (ROS) and DNA damage in cells. It estimated the natural effect of supplementation with green tea in hypertensive cases by a double-eyeless, placebo- controlled trial. After three months of supplementation, both systolic and diastolic blood pressures had significantly dropped. The supplementation also contributed to significant diminishments in the total and LDL cholesterol and triglycerides, but an increase in HDL cholesterol. Diurnal input of 379 mg green tea excerpt positively influences blood pressure and lipid profile in cases with rotundity- related hypertension. It studied the effect of green tea on the genes involved in rotundity.^[11]

Supplementation of the test rats with tea in the drinking water reduced body weight as compared to the high-fat diet- fed rats. PCR analysis of RNA from liver samples threw light on gene expression. Regulatory conduct on the rotundity- related genes, anti-inflammation and anti-oxidant capacities were observed. They plant EGCG to be the most potent lipase asset among purified major polyphenols during simulated libation containing caffeine and green tea catechins in combination with answerable fiber drop the pining for food and Energy input relative to a libation with equal sweet content. Sating power and weight loss eventuality of green tea was verified^[11]



“Fig.9”: As shows the Obesity offered by green tea.

EFFECT ON BREAST CANCER:

Breast cancer may be a malignant proliferation of somatic cell lining, the ducts or lobules of the breast. Carcinoma is common cancer among women. Tea has increased attention for its health benefits, especially anticancer effects.^[25] The preventive and therapeutic activities of green tea components on carcinoma found in animal studies. research has been conduct to uncover the mechanisms at cellular and molecular levels. Tea has shown anticarcinogenic effects against carcinoma in experimental studies.^[25]

Immunity and Genetic Modulation

The autoimmune disorder, primary Sjogren’s syndrome is associated with xerostomia (dry mouth) and xerophthalmia (dry eye).^[11] Geneticorepigenetic and environmental factors are causative factors of the malady. It Studies the effect of EGCG in reducing stress on DNA, as a preventive strategy against the syndrome. EGCG are consumption normalizes the expression of proliferating cell nuclear antigen and thePRDX6 antioxidant enzyme have been shown biomarkers in BALB/c mice model. Reported that tea extract and EGCG have immunoregulatory effects on human IgE responses as studied on human peripheral blood mononuclear cells in vitro. Green tea could also be wont to decrease the attacks of allergic asthma.^[11]

Conclusion:

Green Tea is popular nutraceutical used world Wide. there are many health-related beneficial effects of green tea such as prevention of obesity liver cirrhosis, insulin dependent Diabetes mellitus, hypertension and various cancer disease. It is the natural source and available at minimum cost with health benefits day to day development of green tea consumption will facility future research in the areas due to health benefits of green tea is of Biomarkers attractive to modern medicine.

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