

COLON CANCER TREATMENT BY THE COFFEE

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ABSTRACT

For several years the physiological effects of coffee have been focused on its many physiological properties disregarding the hundreds of bioactive coffee components, such as mainly caffeine and many others like polyphenols, melanoidins, carbohydrates, diterpenes, etc. Mainly the antioxidant and anti-inflammatory property of caffeine lowers the risk of colon cancer, the third most common cancer worldwide. In this frame, this paper reviews the roles of coffee lowering the risk of colon cancer development. Taken together all studies indicated that not only the properties of caffeine in coffee lowering cancer risk but also is due to their *in vivo* metabolism and composition such as polyphenol content like chlorogenic, caffeic, ferulic, cumaric acids and diterpenes, melanoidins and functions where discussed in the article. In fact, with most studies are talking about two or more cup of coffee a day.

KEYWORDS: chlorogenic, caffeic, ferulic, cumaric acids and diterpenes.**INTRODUCTION****COLON CANCER**

Cancer of the colon is the disease characterized by the development of malignant cells in the lining or epithelium of first and longest portion of the large intestine. Malignant cells have lost normal control mechanisms governing growth. These cells may invade surrounding local tissue, or they may spread throughout the body and invade other organ systems.

CAUSES OF COLON CANCER

- 1) Polyps
- 2) Genes - the DNA type
- 3) Genes - the family type
- 4) Traits, habits and diet
- 5) Other medical factors

SYMPTOMS OF COLON CANCER

Colon Cancer symptoms are quite varied and depend on where the cancer is located, where it has spread and how big the tumour is.

However, when the cancer grows symptoms include-

- Diarrhoea or constipation
- Changes in stool consistency
- Narrow stools
- Rectal bleeding or blood in the stool
- Pain, cramps, or gas in the abdomen
- Pain during bowel movements

COFFEE

Coffee is a brewed drink prepared from roasted coffee beans, which are the seeds of berries of *Coffea* plant. The genus *Coffea* is native to tropical Africa, and Madagascar, the Comorons, Mauritius and Reunion in the Indian Ocean. Coffee plants are now cultivated in over 70 countries, primarily in the equatorial regions of the Americas, Southeast Asia, India and Africa. Once ripe, coffee berries are picked, processed and dried. Dried coffee seeds (referred to as beans) are roasted to varying degrees, depending on the desired flavour. Roasted beans are ground and brewed with near boiling water to produce coffee as a beverage.

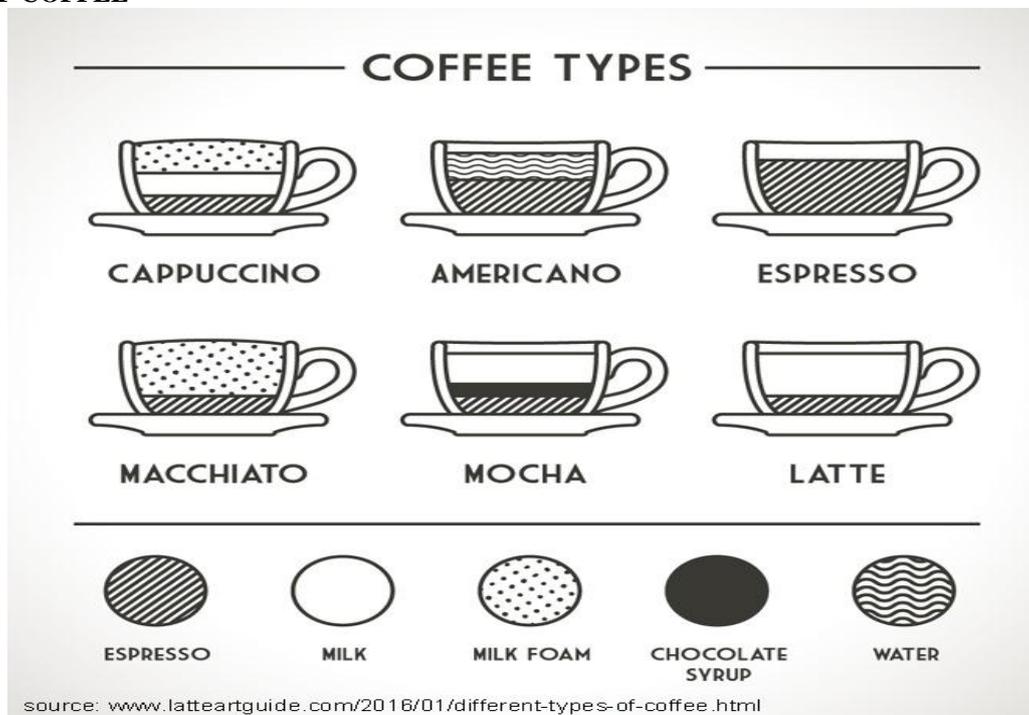


WHAT'S IN COFFEE?

Caffeine, a naturally occurring stimulant that affects the central nervous system.

- Chlorogenic acid, an antioxidant compound that is the major phenol in coffee.

- Quinic acid, a phytoeol, compounds that are extracted from the beans' oil during brewing, that contributes to the acidic taste of coffee
- Cafestol and kahweol.
- N-methylpyridinium (NMP), created by roasting, may make the antioxidants more potent.

TYPES OF COFFEE**ROLES OF COFFEE IN LOWERING THE COLON CANCER**

Coffee has been proposed as a protective agent against colon cancer because of several its components that affect the physiology of the colon. These compounds include caffeine, melanoidins, diterpenes and polyphenols. Protection may arise from changes to the microbiome, antioxidant effects, antimutagenic effects, reduction of bile acid secretion, and improved bowel functions such as motility and capacity.

1) Caffeine

- Caffeine reduces the colon cancer by its anti-oxidant and anti-inflammatory properties and also by inhibition of colon cancer cell growth.
- Caffeine strongly suppress colon cancer metastasis and neoplastic cell transformation by suppressing mitogen-activated protein kinase (MAPK or MAP kinase), a type of protein kinase that is specific to the amino acids such serine, threonine and tyrosine. They regulate cell functions including proliferation, differentiation, mitosis and caffeine bound directly to MEK1 in an ATP-noncompetitive manner and also inhibit ERKs pathway, a extracellular signal-regulated kinases (ERKs) that are widely expressed protein kinase intracellular signalling, which mainly get activated by carcinogens.

- Coffee lowers the risk of colon cancer mainly due it's caffeine content and the factors that affect the caffeine content in coffee are-
- **Type of coffee beans:** There are many varieties of coffee beans available, which may naturally contain different amounts of caffeine.
- **Roasting:** Lighter roasts have more caffeine than darker roasts, although the darker roasts have a deeper flavour.
- **Type of coffee:** The caffeine content can vary significantly between regularly brewed coffee, espresso, instant coffee and decaf coffee.
- **Serving size:** "One cup of coffee" can range anywhere from 30–700 ml (1–24 oz), greatly affecting the total caffeine content.

2) Polyphenols

- Coffee polyphenolic compounds include chlorogenic, caffeic, ferulic and cumaric acids, and diterpenes (cafestol and kahweol) have been shown to possess anticarcinogenic properties by reducing the bile acid secretion by down-regulation of the expression of bile acid homeostatic genes and increase in colonic motility and by reducing the length of time mutagens are in contact with the intestinal mucosa.

- Coffee consumption reduces the risk of cancers, but the molecular mechanisms and target(s) underlying the chemopreventive effects of coffee are based on serving size or daily units, coffee contains larger amounts of phenolic phytochemicals than tea or red wine

3) Methyl pyridium

- Methyl pyridium is produced as a breakdown product of the antioxidant trigonelline during the roasting process for coffee, that gives coffee its aroma and slightly bitter taste will raises the phase II enzyme level that have protective effect and lowers the risk of colon cancer.
- Trigonelline is not exclusively found in coffee, other sources are walnuts, strawberries, blackberries and the concentration of it is significantly higher in these secondary sources.

CONCLUSION

The patients who had reported drinking four or more cups of caffeinated coffee a day were 52 percent less likely to have had a recurrence of colon cancer or to have died than those who had never drank coffee, while those who drank two to three cups of caffeinated coffee a day were 31 percent less likely than non- drinkers to have had a recurrence or to have died.

As you sip your delicious coffee at the breakfast table remember that the coffee you drink provides more than just flavour.

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