A REVIEW | International Journal of Plant Sciences, Vol. 4 Issue 1 : 309-312 (January to June, 2009)

A pharmacological review of Coffee

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Accepted : November, 2008

Key words : Coffee, Clinical studies

Coffee has been used in day to day routine in as a stimulant throughout the world.This review summarizes mainly the chemical constituents, pharmacological activities, toxicology and safety profile of coffee in animal and clinical studies.

Coffea (coffee) is a genus of ten species of flowering plants in the family Rubiaceae. They are shrubs or small trees, naturally grows in the shades native to subtropical Africa and southern Asia. Seeds of this plant are the source of a stimulating beverage called coffee. The seeds are called "beans" in the trade. Coffee beans are widely cultivated in tropical countries in plantations for both local consumption and export to temperate countries.

Bush or small tree easily grown to height of 10-12 feet, in about 5-10 per cent of any crop of coffee cherries, the cherry will contain only a single bean, rather than the two usually found. Fresh, dark-roasted coffee beans are of 11mm x 8 mm x 5 mm of size approximately. This is called a 'peaberry' and contains a distinctly different flavor profile to the normal crop, with a higher concentration of the flavors, especially acidity, present due to the smaller sized bean. The coffee tree will grow fruits after 3–5 years, for about 50–60 years usually. The caffeine content in coffee "beans" is a natural defense, the toxic substance repelling many creatures that would otherwise eat the seeds, as with nicotine in tobacco leaves.

Recent epidemiological studies have suggested unexpected, possibly beneficial effects of coffee against the occurrence of alcoholic liver cirrhosis and upon serum liver enzymee levels (Tanaka *et al.*, 1998)

After picking, the coffee beans are pulped (usually using a mechanical pulper) to remove the bulk of the soft flesh, and then the beans are fermented (by one of several means, most often wet fermentation in water for 10 to 36 hours), then washed (to remove the last of the sticky mucilage not removed by fermentation) and dried (usually in the sun).

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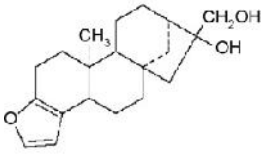
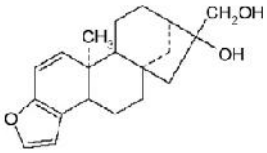
Chemical constituents:

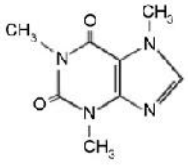
Coffee contains caffeine, many bio-amines (Putrescine, spermidine, spermine, serotonin), nicotine, Phenolic compounds (neochlorogenic acid and feruloylquinic acid) mixture and seven kind of hydroxycinnamic acid derivatives (Iwai *et al.*, 2005; Marcos *et al.*, 2008). Among the naturally occurring heat-sensitive components in the dry bean are Trigonelline, present at an average concentration of about 1% (calculated on the dry basis), amino acids (0.8%) and glucose (0.04%).



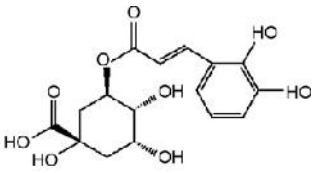
Cafestol



Kahweol



Caffeine



Chlorogenic acid

Pharmacological properties:

Antioxidant:

Antioxidant activity of instant coffee produced from green coffee beans roasted at three different degrees was analyzed by Delgado *et al.* (2005) Higher molecular mass fractions were found to possess antioxidant activity while the lower molecular mass fractions showed protective activity (Daglia *et al.*, 2000; Delgado *et al.*, 2005).

Anti-hypertensive:

The blood pressure in spontaneously hypertensive rats (SHR) is decreased dose dependently, when they are treated with different doses (180 to 720 mg/kg, p.o.) of water extract of green coffee. It is seen that coffee may have ACE-inhibitory activity (Rufian and Marales, 2007; Suzuki *et al.*, 2002).