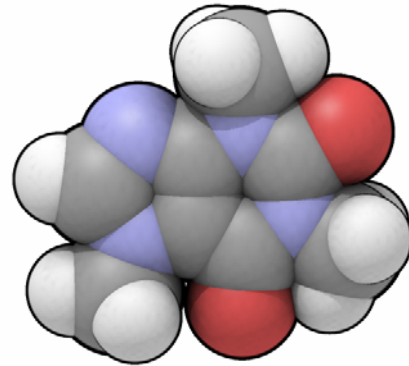
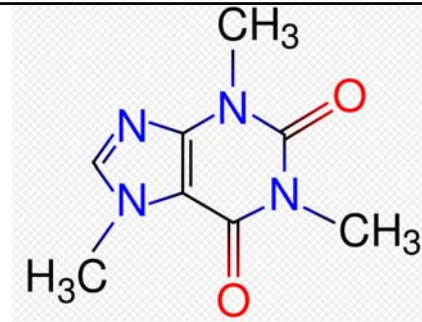


Caffeine

- Coffea, Theobroma, Camelia, Kola, etc.*
- Psychoactive stimulant, diuretic
- Alkaloid



Caffeine

- syn. w/ guaranine

Paullinia cupana (guarana' vine)
Sapindaceae. Native of S. America



Caffeine

-syn. w/ theine

Camelia sinensis (tea bush)
Theaceae. Native of S. Asia



Caffeine

-syn. w/ mateine

Ilex
paraguariensis
(yerba mate)
Aquifoliaceae.
Native of S.
America.



Caffeine

-known as caffeine (orig. *kaffein*, from *kaffee*)



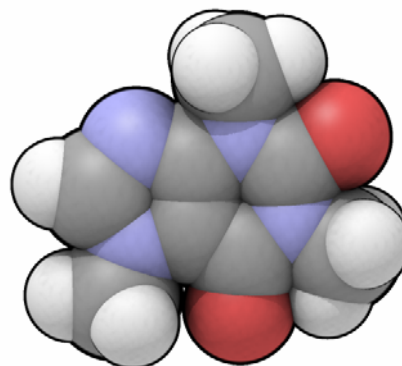
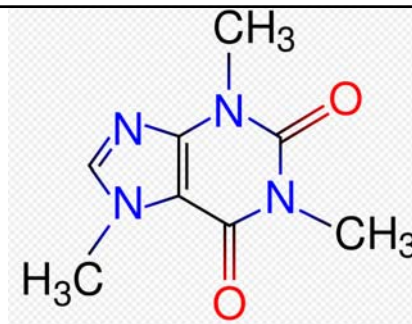
Coffea arabica
(arabica coffee)
Rubiaceae.
Native of NE
Africa.

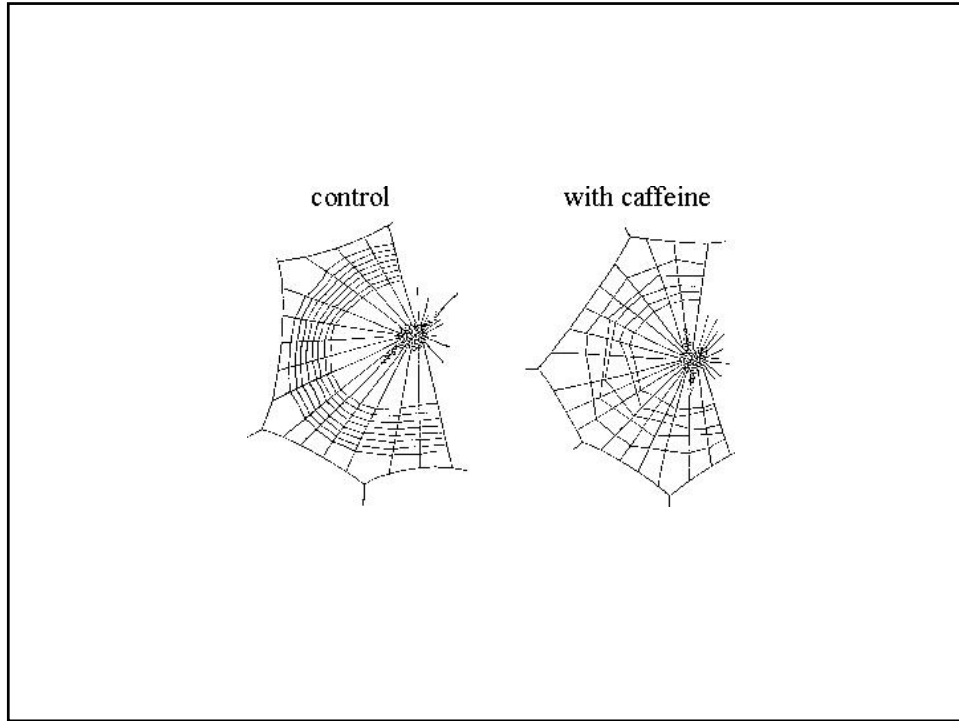
Caffeine

-Alkaloids:

- Nitrogenous cmpds.
- Psychoactive (act on CNS)
- Secondary metabolites

-Natural pesticide, N-reservoir

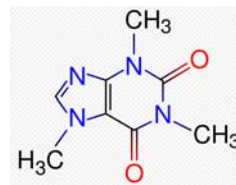




Caffeine's effects on CNS

- Caffeine from coffee in blood w/in 5 min
- Stimulates heart
- Increases stomach acidity
- Increases urine output
- 10% rise in metabolic rate

- Mimics feelings assoc. w/ adrenaline



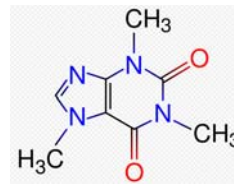
caffeine

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caffeine

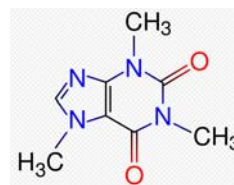
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- Excess (1 g; 10 cups) can cause anxiety, headache, dizziness, insomnia, heart palpitations, delirium, 4% lower birth weights.

- Ranks as most widely used psychoactive drug worldwide (coffee, tea, additives to soft drinks)



caffeine

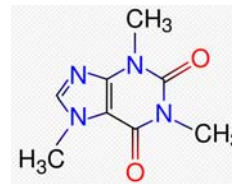
Caffeine's effects on CNS

How?

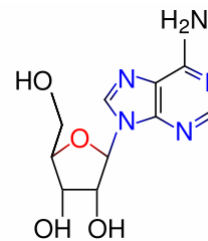
Antagonist of adenosine.

Adenosine:

- Attaches to brain cell receptors
- Artery dilation
- Locomotor suppression
- Sedation.



caffeine



adenosine

Caffeine and Parkinson's prevention?

What is Parkinson's Disease?

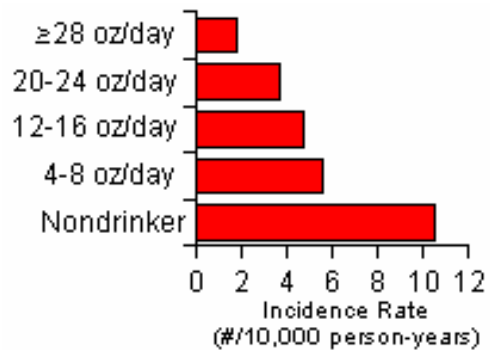
Journal of the American Medical Association, March 24, 2000

- afflicts ca. 1-1.5 million people in the U.S., mostly 60 years +
- no known cause and no cure, just treatments
- symptoms of trembling arms and legs, trouble speaking, and difficulty coordinating movement

- neuron degeneration in spec. part of brain
- many of these neurons contained the neurotransmitter dopamine
- dopamine levels fall, and the balance between dopamine and other neurotransmitters disrupted, affecting muscular control

Caffeine and Parkinson's prevention?

Honolulu Heart Program study of 8,000+ men over 30?

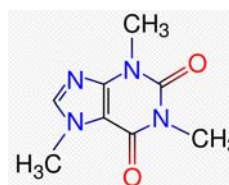


When adenosine receptors blocked, dopamine levels increase.

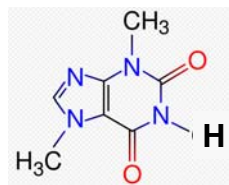
Caffeine and Theobromine are similar in structure and action

Table 1. Stimulant alkaloids in world's major stimulating beverages (Simpson 1986). Given in % weight. Amt. in particular beverage depends on how it is made.

Plant, part	Caffeine	Theobromine
Coffee, unroasted, dried seeds	1-1.5	--
tea, dried lvs.	2.5-4.5	--
Cacao, dried or fresh seeds	0.6-0.8	1.7-2.4
Kola, fresh seeds	2.0	--
Guarana, dried fruit	3.0-4.5	--



caffeine

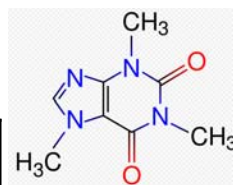


theobromine

Caffeine in some beverages

Table 2. Stimulant alkaloids in world's major stimulating beverages (Simpson 1986). Given in % weight. Amt. in particular beverage depends on how it is made.

Drink	Caffeine (mg)
Coffee	
5 oz Drip, percolator, instant, decaf	146, 110, 53, 2
1 oz espresso	?

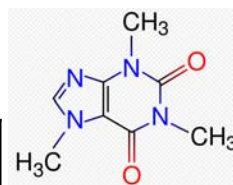


caffeine

Caffeine in some beverages

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Drink	Caffeine (mg)
Coffee	
5 oz Drip, percolator, instant, decaf	146, 110, 53, 2
1 oz espresso	50

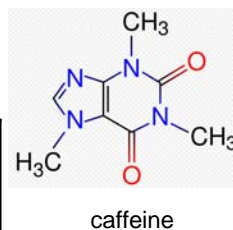


caffeine

Caffeine in some beverages

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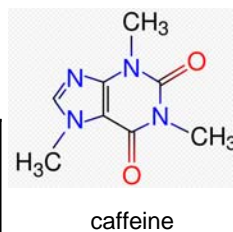
Drink	Caffeine (mg)
Coffee	
5 oz Drip, percolator, instant, decaf	146, 110, 53, 2
1 oz espresso	50
Tea (5 oz)	
Brewed 1 min, 3-5; 12 oz can	9-33, 20-50, 22-36
Cocoa and chocolate	
6 oz, from powder	10
1 oz milk choc	6
1 oz dark choc	20
1 oz baking choc	35
Soda (12 oz)	
Mt. Dew	52
Dr. Pepper	37-38
Pepsi	37
Coca cola	34



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99.93% caffeine-free
(drip coffee is 99.90%)

Focus on Coffee

One of most important commodities in terms of value traded annually



Coffea arabica
(arabica coffee)

Table 3. Production of top 3 stimulant beverages.

Top 3 continents	Total (MT)
Coffee	5,919
1. S Amer	
2. Africa	
3. N & C Amer	
Tea	2,473
1. Asia	
2. Africa	
3. S Amer	
Cocoa	2,329
1. Africa	
2. S Amer	
3. Asia	

Focus on Coffee

Coffee Biotech Group (Campinas, Brazil)



Focus on Coffee



Focus on Coffee



Focus on Coffee



Focus on Coffee



Focus on Coffee

Coffea arabica, old world tropical/subtropical crop grown at mid to upper-middle elevations



Focus on Coffee

Coffea arabica, old world tropical/subtropical crop grown at mid to upper-middle elevations

Native to Africa yet comparatively few Africans drink it.

Earliest records of use from Ethiopia (chewing of leaves and fruits from wild). Green-fruits plus fat were survival ration on hunts. Relieved fatigue, hunger.



Farmer in Ethiopia

Focus on Coffee

Arrival in Yemen 13-14 century, where it was first brewed (hence, Coffea arabica).



ca. 1900

11059—A Coffee-house in Palestine.

Focus on Coffee

Arrival in Yemen 13-14 century, where it was first brewed (hence, Coffea arabica).

Drinking spread from Arabia to Egypt by 1510

To Italy by 1616.

Vienna priests alarmed at “coffee culture”, urged Pope to ban it since it was the drink of the “infidels.” But Pope Clement VIII learned that he actually liked it.

To England by 1650 and coffee houses became important socio-politico institutions.

Europe looked to break Arabian monopoly on production.

Focus on Coffee

Arabians killed embryos in seeds before export.

Dutch obtained live seeds from Mocha (Red Sea Coast, Yemen)

Eventually, one seed made it to Amsterdam in 1706.

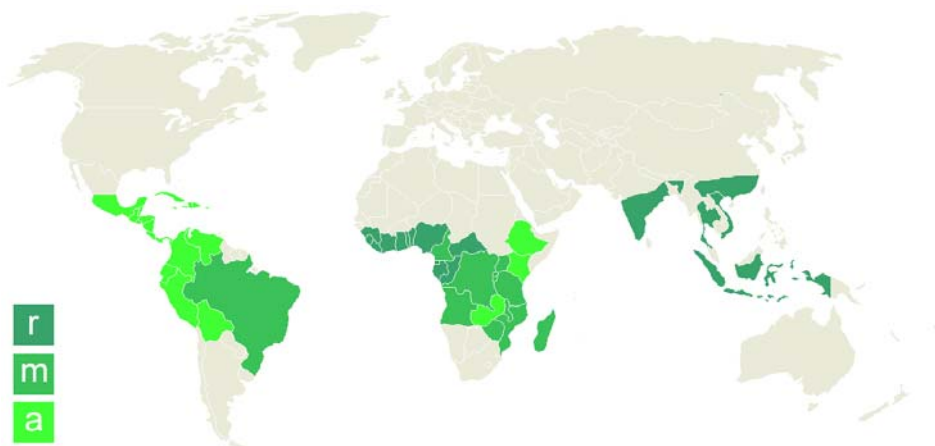
Seeds from Dutch tree then spread throughout Europe and to S America by 1717.

Today, Brazil is world's leading producer.

Focus on Coffee

Areas of coffee production

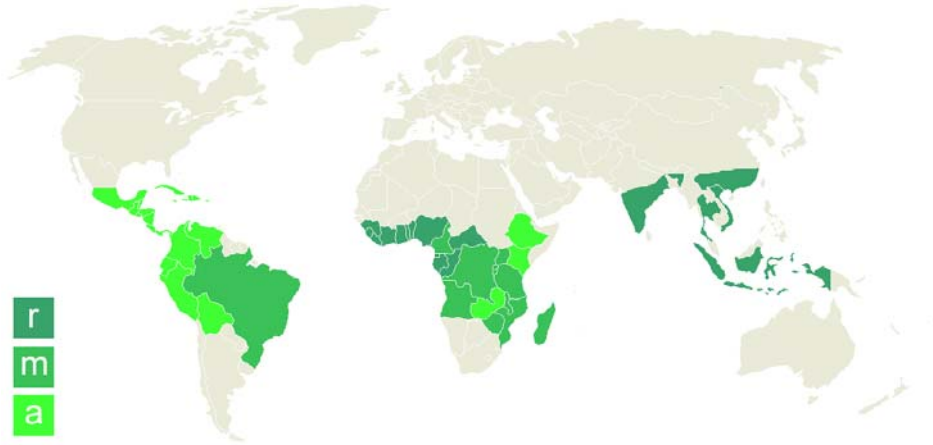
(a = *Coffea arabica*, r = *C. canephora* or 'robusta', m = both; *C. liberica* or 'Liberian' not shown)



Focus on Coffee

Areas of coffee production

(a = *Coffea arabica*, r = *C. canephora* or 'robusta', m = both; *C. liberica* or 'Liberian' not shown)



Characteristics of Arabian coffee that make it best?

Empty box for notes or answer.