

Botanical Stimulants

Wakeups, Kickers, and Bad Boys



Major Botanical Stimulants By Plant Family

Aquifoliaceae - Holly Family (*Ilex paraguariensis*, *I. guayusa*, *I. vomitoria*)

Arecaceae - Palm Family (*Areca catechu*)

Cactaceae - Cactus Family (*Lophophora williamsii*)

Campanulaceae - Bellflower Family (*Lobelia sp.*)

Celastraceae - Bittersweet Family (*Catha edulis*)

Ephedraceae - Ephedra Family (*Ephedra nevadensis*, *E. viridis*, *E. sinica*)

Erythroxylaceae - Coca Family (*Erythroxylum coca*)

Fabaceae - Pea Family (*Acacia berlandierii*, *Piptadenia peregrina*, *Sophora scundiflora*)

Malvaceae - Mallow Family (*Theobroma cacao*, *Cola acuminata*, *C. nitida*)

Loganiaceae - Logan family (*Strychnos nux-vomica*)

Sapindaceae - Soapberry Family (*Paulina cupana*)

Solanaceae - Nightshade Family (*Nicotiniana tabacum*, *N. rustica*, *Datura stramonium*)

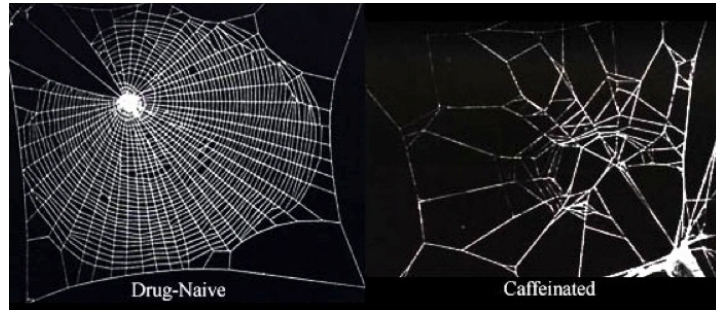
Rubiaceae - Madder Family (*Coffea arabica*, *C. canephora robusta*)

Theaceae - Camelia Family (*Camelia sinensis*)

Everyday Wakeups

1. Caffeine, Theophylline, and Theobromine (adenosine antagonists)

Most commonly used stimulants ...global annual caffeine consumption estimated at 120,000 tons.



Coffee - *Coffea arabica*.

C. canephora (aka *robusta*) - Rubiaceae (Madder family)

Native to Africa and Asia; infusion of ground dried and roasted beans.

Robusta 2x caffeine as arabica, but with environmental loss.

Tea - *Camelia sinensis* - Theaceae (Camelia family)

Native to China and India; infusion of dried young leaves.

Chocolate - *Theobroma cacao* - Malvaceae (Mallow family)

Native to tropical America; beans in fruit prepared in many ways.

Kola - *Cola acuminata*, *C. nitida* - Malvaceae (Mallow family)

Native to tropical Africa; seeds prepared as infusion.

Yerba Mate - *Ilex paraguariensis*, *I. guayusa*, *I.*

vomitorea - Aquifoliaceae (Holly family)

Native to Americas; leaves prepared as infusion.

Also called "the black drink" in SE US and

Caribbean. *I. vomitoria* (Yaupon holly) is the only

native North American plant containing caffeine.

Fruit important food for armadillos, fox, raccoon,

skunks, and birds. Species name is a European

misnomer.



Guarana - *Paulina cupana* - Sapindaceae (Soapberry family)

Native to the Amazon basin; seeds prepared as infusion. Split fruit

resemble eyeballs. Commonly used in South America as soft-drink

additive. Seeds contain twice the caffeine as coffee beans.

Caffeine in Common Drinks

below are concentrations in about 12 ounces

Root Beer, Ginger Ale, Sprite	0 mg
Hot Chocolate	5
Twining's Earl Grey Tea	25
Sodas, Black Teas	40
Red Bull	110
Starbucks K-cups	130
McDonald's Brewed Coffee	145
Monster Energy Drink	160
Rockstar Energy Drink	160
5 Hour Energy Drink	200
Dunkin' Donuts Brewed Coffee	210
Starbucks Pike Place Brewed Coffee	235
Starbucks Plus K-cups	260
7-Eleven Brewed Coffee	280
Death Wish Coffee	728

Mostly Stimulants, But Sometimes Depressants, Very Addictive

2. Nicotine - third most commonly-used drug after caffeine and ethanol

Tobacco - *Nicotiniana tabacum*, *N. rustica* - Solanaceae (Nightshade family)
Native to Americas; dried leaf is smoked, chewed, snorted. Nicotine itself is not carcinogenic, it's the other toxins in the smoke (carbon monoxide, cyanide, organic tars) which poison lung tissue. Nicotine's addictive action interferes with the brain's natural reward system in a manner similar to cocaine. Nicotine is a good natural pesticide but harmful to pollinators. Synthetic commercial versions banned in US wildlife refuges in 2014; ban reversed in 2018. Banned completely in EU in 2108 because of effects on bees.



Betel Nut - *Areca catechu* - Arecaceae (Palm family)
Native to East Asia; active ingredient is nicotine-like Arecaidine. Palm seeds wrapped in betel pepper leaves (*Piper betel*) and chewed. The bright red spit ejected by chewers is considered a public nuisance in some countries.

Puke Weed, Indian Tobacco - *Lobelia inflata* and other *Lobelias* - Campanulaceae (Bellflower family).
Native to North America; active ingredient is nicotine-like Lobeline. Leaves are smoked. Presumably too much makes you puke...



The Kickers

When Caffeine Isn't Enough....

1. Cocaine

Coca - *Erythroxylum coca* - Erthroxylacea (Coca family)

Native to South America; dried leaves are chewed in a wad with slaked lime (calcium hydroxide). With Cola nut (caffeine) part of the original formula for Coca-Cola. Processed leaves (no cocaine) are still used as a flavorant in Coke. Used in South America to keep folks awake and alert, suppress appetite, and protect against altitude sickness. Commonly sold on the streets in Andean cities and towns. Mild euphoria.

2. Cathionine

Khat - *Catha eduis* - Celastraceae (Bittersweet family)

Native to Arabia and Africa; chewed like Coca leaves, effects like Coca and caffeine.

3. Ephedrine

Mormon Tea - *Ephedra nevadensis*, *E. viridis*,

E. sinica - Ephedraceae (Ephedra family)

Native to China (*E. sinica*) and Western US (*E. nevadensis*, *E. viridis*); dried leaves taken as infusion. In use in Chinese herbal medicine for 5000 years. Chemically, ephedrine is an amphetamine analog and a used to make synthetic amphetamines (speed). Used as decongestant; sales of cold medicines containing ephedrine are controlled due to use in the production of methamphetamine. Use in diet pills with caffeine (“trucker speed”) is illegal in US.



The Bad Boys

Hallucinogens and CNS Poisons

1. Mescaline

Peyote - *Lophophora williamsii* - Cactaceae (Cactus family)
Native to Mexico and Big Bend Region; "buttons" taken as chew or brewed as a tea. Mescaline triggers rich auditory and distinctive colored geometric visual hallucinations.



Acacia - *Acacia berlandierii* and *A. rigidula* (*Blackbrush*)- Fabaceae (Pea family)
Native to US southwest, contains trace amounts of mescaline and nicotine, also natural amphetamine and methamphetamine. Toxic to livestock. Bees on its flowers make really good honey. Some sources consider alkaloid claims in Acacia sp. suspect.



2. Bufotenine

Cohaba - *Piptadenia peregrina* - Fabaceae
Native to Andean South America; dried seeds are smoked or snorted. Bufotenine originally isolated from frog skin. Hallucinogenic effects similar to mescaline.

3. Cysticine

Texas Mountain Laurel, Mescalbean, Red Bean - *Sophora secundiflora* - Fabaceae
Native to SW US; seeds are used. No mescaline, never mind the common name. Predates peyote use. 6-ft string of beans buys you a pony in some places... Cysiticine is related to nicotine and is hallucinogenic.



4. Atropine and Scopolamine

Jimsonweed (aka Thornapple, Moonflower, Zombie Cucumber) - *Datura stramonium* - Solanaceae (Nightshade family)
Native to North America; leaves are smoked. Extremely toxic, easily fatal in small amounts. Used in herbal medicine as anesthetic and to treat asthma. Active ingredients cause delirium and hallucinations. Plants from this genus are used as poisons in some cultures. Datura is a member of the “witches weeds”, along with deadly nightshade, henbane, and mandrake.



5. Strychnine

Strychnos nux-vomica is a tree native to southern Asia; its seeds are the source of strychnine and brucine, powerful central nervous system stimulants causing convulsions in small doses. Strychnine is commonly used as a pesticide. It has no known medicinal uses. In the 19th Century it was thought to be similar to coffee and was used as a recreational stimulant.