

Alkaloid as Natural Products

- **Largest class of secondary metabolites, >6500 compounds known**
- **Contains N, most compounds are basic (alkaline)**
- **Often highly toxic**
- **Found in certain higher plants**
- **Little is known regarding why alkaloids are produced**
- **Biosynthesis from amino acids**

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Many of these substances have marked physiological effects, a fact discovered by many ancient people long before organic chemistry developed.

Like, alkaloid quinine, a chief constituent of bark of Cinchona, has been used as effective antimalarial since 1639.

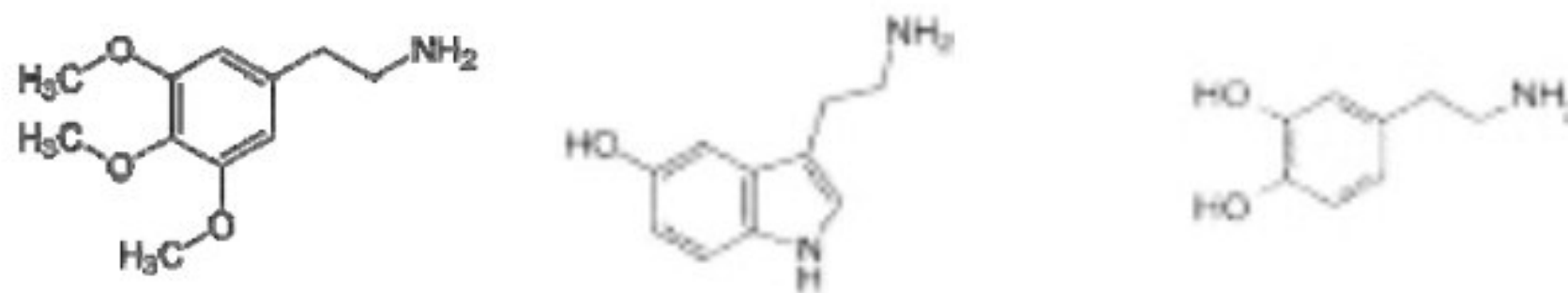
Alkaloids are produced by a large variety of organisms, including bacteria, fungi, plants and animals and are part of the group of natural products (also called secondary metabolites).

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The boundary between alkaloids and other nitrogen-containing natural compounds is unclear.

Compounds like amino acid, peptides, proteins, nucleotides, nucleic acid, amines and antibiotics are usually not called alkaloids.

Natural compounds containing nitrogen in the exocyclic position (mescaline, serotonin, dopamine, etc.) are usually attributed to amines rather than alkaloids.



Some authors, however, consider alkaloids a special case of amines.

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Effects of alkaloids on humans

- High biological activity
- Produce varying degrees of physiological and psychological responses - largely by interfering with neurotransmitters
 - others interfere with membrane transport, protein synthesis or other processes
- In large doses - highly toxic - fatal
- In small doses, many have therapeutic value
 - muscle relaxants, tranquilizers, pain killers, mind altering drugs, chemotherapy

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Psychoactive alkaloids (affecting mental process)

- Although only a small percent are psychoactive, these get much focus
- Affect the central nervous system - often by influencing neurotransmitters
- Categories of psychoactive compounds
 - Stimulants
 - Hallucinogens
 - Depressants
- May also be narcotic (*addictive*)

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Psychoactive alkaloids

Stimulants Hallucinogens Depressants

Cocaine Tropane alkaloids Morphine

Ephedrine Mescaline Codeine

Caffeine Psilocybin Heroin

Ergot alkaloids (LSD)

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