

Alkaloids

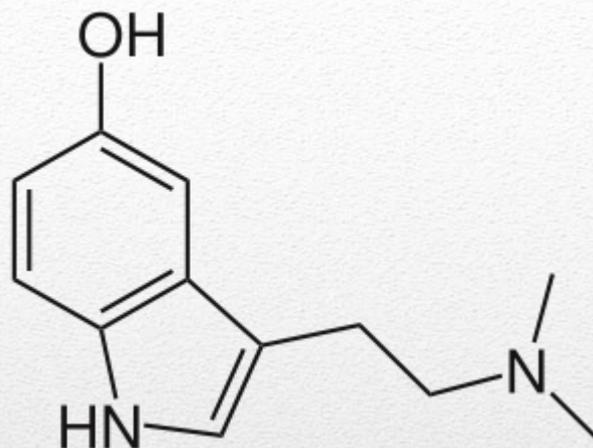
Med.Plants.Biotech
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- **Alkaloids** are a group of naturally occurring chemical compounds that contain mostly basic nitrogen atoms. This group also includes some related compounds with neutral and even weakly acidic properties.
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- Some synthetic compounds of similar structure are also attributed to alkaloids.
 - In addition to carbon, hydrogen and nitrogen, alkaloids may also contain oxygen, sulfur and more rarely other elements such as chlorine, bromine, and phosphorus.
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- 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). Many alkaloids can be purified from crude extracts by acid-base extraction. Many alkaloids are toxic to other organisms. They often have pharmacological effects and are used as medications, as recreational drugs, or in entheogenic rituals.
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- The boundary between alkaloids and other nitrogen-containing natural compounds is not clear-cut.^[8] Compounds like amino acid, peptides, proteins, nucleotides, nucleic acid, amines, and antibiotics are usually not called alkaloids.
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- **Biological precursors of most alkaloids are amino acids, such as ornithine, lysine, phenylalanine, tyrosine, tryptophan, histidine, aspartic acid, and anthranilic acid. Nicotinic acid can be synthesized from tryptophan or aspartic acid.**
 - **Ways of alkaloid biosynthesis are too numerous and cannot be easily classified.^[73] However, there are a few typical reactions involved in the biosynthesis of various classes of alkaloids, including synthesis of Schiff bases and Mannich reaction.**
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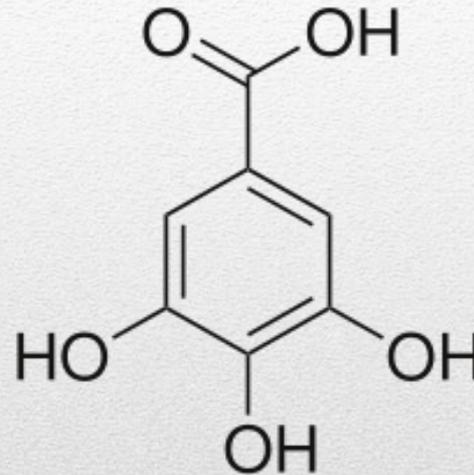
• Tannin



A tannin (also known as *vegetable tannin*, *natural organic tannins* or sometimes *tannoid*, i.e. a type of biomolecule, as opposed to modern synthetic tannin) is an astrigent, bitter plant polyphenolic compound that binds to and precipitates proteins and various other organic compounds including amino acids and alkaloids.

- The tannin compounds are widely distributed in many species of plants, where they play a role in protection from predation, and perhaps also as pesticides, and in plant growth regulation.
 - The astringency from the tannins is what causes the dry and puckery feeling in the mouth following the consumption of unripened fruit or red wine.
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- **There are three major classes of tannins: Shown below are the base unit or monomer of the tannin.**



- **Particularly in the flavone-derived tannins, the base shown must be (additionally) heavily hydroxylated and polymerized in order to give the high molecular weight polyphenol motif that characterizes tannins.**
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