

A Brief Note on Tannins

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Commentary

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DESCRIPTION

The tannin compounds are widely distributed in many plant species where they protect against predation (including as pesticides) and may aid in plant growth regulation. The astringency of tannins is what causes the dry and puckery sensation in the mouth after consuming unripened fruit, red wine or tea. Similarly, the destruction or modification of tannins over time is an important factor in determining harvesting times. Tannins are found in plant species all over the world. They are common in gymnosperms as well as angiosperms. Mole investigated the distribution of tannin in 180 dicotyledon families and 44 monocotyledon families.

Tannin-free species can be found in the majority of dicot families (tested by their ability to precipitate proteins). *Aceraceae*, *Actinidiaceae*, *Anacardiaceae*, *Bixaceae*, *Burseraceae*, *Combretaceae*, *Dipterocarpaceae*, *Ericaceae*, *Grossulariaceae*, *Myricaceae* and *Najadaceae* and *Typhaceae* are the best known families in which all species tested contain tannin. 73 percent of the oak species tested contained tannin, according to the *Fagaceae* family. Only 39 percent of the *Mimosaceae acacias* tested contained tannin while the *Solanaceae* rate dropped to 6 percent and the *Asteraceae* rate dropped to 4 percent.

Tannins are produced by a chloroplast-derived organelle called the tannosome in all vascular plants studied. Tannins are primarily found in the vacuoles or surface wax of plants. These tannin storage sites keep tannins active against plant predators while also preventing some tannin from interfering with plant metabolism while the plant

tissue is alive. Tannins are ergastic substances which are non-protoplasmic materials found in cells. Tannins are known to precipitate proteins. They must be stored in organelles that can withstand the protein precipitation process in this condition. Idioblasts are plant cells that are distinct from neighbouring tissues and contain non-living substances. They serve a variety of purposes including the storage of reserves, excretory materials, pigments and minerals. They may contain oil, latex, gum, resin or pigments among other things.

Tannin-rich plant communities have evolved convergently on nutrient-poor acidic soils all over the world. Tannins were once thought to be anti-herbivore defences but ecologists are now recognizing them as important regulators of decomposition and nitrogen cycling processes. As concern about global warming grows there is a growing interest in better understanding the role of polyphenols as carbon cycling regulators particularly in northern boreal forests. Leaf litter and other decaying parts of the New Zealand tree kauri (*Agathis australis*) decompose much more slowly than those of most other species. Aside from its acidity, the plant contains substances that are harmful to microorganisms such as waxes and phenols most notably tannins. A black water river is formed by the leaching of highly water soluble tannins from decaying vegetation and leaves along a stream. The dissolved peat tannins in the water that flows out of bogs give it a distinctive brown colour. The presence of tannins (or humic acid) in well water can cause it to smell bad or taste bitter but it is not dangerous to drink. Tannins leaching from an unprepared driftwood decoration in an aquarium can cause the pH to drop and the water to turn a tea-like colour. To avoid this, boil the wood several times in water, discarding the water each time. The same effect can be achieved by using peat as an aquarium substrate.