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Glossary of Botanical Terms

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z



A

A - Latin prefix: not, negative, without, lacking

Abaxial - facing away from the main axis e.g. lower surface of a [leaf](#).

Abiotic - of non-living environmental factors (precipitation, temperature, wind) that affect living members of an ecosystem.

Abortive - development arrested while incomplete or [imperfect](#).

Abscise - to cut off. Hence abscission, the normal separation of a [leaf](#), [fruit](#), or [flower](#) from a [plant](#).

Abscisic acid - a [plant hormone](#) that induces abscission of leaves, dormancy and other adaptations to poor growing conditions.

Acanthocarpa - bearing spiny [fruit](#). Also [echinocarpa](#).

Acanthodes - (Greek: *acantha* = thorn) full of [thorns](#) or [spines](#).

Acaulescent - without a visible [stem](#).

Accrescent - continuing to increase in size after maturity or flowering, especially of [floral](#) parts.

Accumbent - of a pair of [cotyledons](#) curving back towards the [hypocotyl](#) so that their edges are turned towards the hypocotyl.

Achene - a small, dry, [indehiscent fruit](#) developing from a simple ovary with the [seed](#) distinct from the [pericarp](#) (fruit wall) which is generally attached to the seed at a single point. A naked seed.

Acicular - needle shaped, applied to an elongated tapering structure with a circular or elliptical cross section.

Aciform - [acicular](#)

Acre - A measure of land area equal to 43,560 square feet, 4,840 square yards or 160 square rods (Metric: 4,046.87 square meters). One square mile equals 640 acres.

Actinomorphic - of [flowers](#) that can be divided into symmetrical halves by cutting across any diameter.

Aculeate - armed with prickles.

Acuminate - with a long pointed structure formed by abrupt narrowing at an apex.

Acute - ending in a sharp point, forming an angle of less than 90 degrees.

Acutifolia - with pointed [leaves](#).

Adaptive radiation - the diversification of a [species](#) under different, local environmental pressures to which it becomes adapted, eventually leading to the emergence of new species.

Adaxial - nearest to or facing towards the main axis e.g. upper surface of a [leaf](#).

Adhesion - of two dissimilar parts touching each other but easily separated and not fused or grown together.

Adnate - of unlike parts growing closely together, attached or fused.

Adpressed - lying close to another [organ](#), but not fused to it.

Adventitious - arising in an irregular or unusual position such as roots arising other than from the [radicle](#) or primary root system; adventitious [buds](#) forming along a [stem](#), generally in response to an injury. Not in the usual place.

Aenea (-us, -um) - bronze coloured.

Aerial - occurring above ground or water.

Aerial root - arising above ground, often from an [axil](#). Provides a means for the [plant](#) to absorb moisture from the air.

Aeruginosa (-us, -um) - deep green with blue colour.

Aestivation - (estivation) - spending the summer months in a dormant state.

aff. - abbreviation of *affinis* = "close to", "similar to", "related to", as a descriptor of unresolved taxa.

Aggregata - clustered.

Agriculture - the science of farming [plants](#) and raising animals.

Alar -

- i. wing-shaped, wing-like.
- ii. in the fork or [axil](#).
- iii. cells in basal angles of the [leaf](#).
- iv. growth regulating chemical sprayed on fruit trees.

Alate - with wings or wing-like appendages.

Alatus (-a, -um) - with wings or wing-like appendages.

Alba - white.

Albiflora - with white flowers.

Albo - white - as a prefix in a compound word.

Hence:

- Albo-aurea - white and gold.
- Albo-marginata - with white edges or margins.
- Albo-maculata - with white spots.
- Albo-striata - with white stripes or striations.
- Albo-vittata - with lengthwise white stripes.

Algae - simple [plants](#) in the Division Protista, consisting of single [cells](#) to multicellular organisms, arranged in colonies or as filaments, and containing photosynthetic pigments. Many common algae are green because their cells contain [chlorophyll](#).

Alkaloid - complex cyclic [organic plant](#) secondary metabolites, usually containing nitrogen in a cyclic ring, with a bitter taste and marked physiological activity on animals. Many of the 7000 known alkaloids are basic (alkaline). Many succulent plants contain alkaloids whose function may be to protect the [plant](#) from non-adapted herbivores, either by virtue of their unpleasant bitter taste or their toxicity. Examples include [atropine](#), berberine, [bryonine](#), [caffeine](#), cocaine, colchicine, [curare](#), [lycorine](#), [mescaline](#), [mesembrine](#), morphine, nicotine, [piperine](#), [pyrrolizidine](#), [quinine](#), [strychnine](#), vincristine. Some of these alkaloids are used medicinally.

Alpina - i. from an alpine habitat. ii. of a dwarf growth habit.

Alpine - occurring above the tree line on very high and cold mountains.

Alternate - of leaves or other parts, not [opposite](#) or [whorled](#), but placed singly at different heights on the [stem](#).

Alveolate - of a surface or structure shaped like a honeycomb e.g. [pollen](#) or [seed](#) surface.

Amethystina - violet.

Amphibious - able to grow in both water and on land or growing with part of the [plant](#) in water or mud and part in the air.

Anastomose - to join together e.g. veins.

Anemophilous - wind pollinated.

Angiosperm - (meaning covered [seed](#)) - a [flowering plant](#) with [ovules](#) (seeds) enclosed in an [ovary](#) ([fruit](#)). Angiosperms developed about 100 million years ago (late Jurassic) and have become the dominant type of terrestrial [plant](#), represented by at least 250,000 species, including both [monocotyledons](#) (e.g. Agave) and [dicotyledons](#) (e.g. Cactaceae).

Angustata - with a narrow [stem](#).

Angustifolia - with narrow leaves.

Annatto - (E160b) A water and alcohol-soluble yellow-red dye made from the pulp surrounding the seeds in pods of the tropical American achiote tree *Bixa orellana*. Annatto is used as a natural food colouring (confectionary, cheese, margarine, smoked fish, custard powder, Caribbean cuisine) and as a fabric or leather dye. South American tribes used the brick-red triangular seeds for body paint and lipstick.

[Structure of annatto](#)

Annual - A [plant](#) that naturally completes its life cycle, from [seed](#) to seed, in one year.

Annual Rings - layers of [wood](#) laid down each year by the [vascular cambium](#) of woody [plants](#), typically in [trees](#). During the season of active growth in the vascular cambium, [xylem](#) cells are being added to the circumference of the xylem tissue. At the start of the growing season the cells grow fast and are large, but as the season progresses towards the dormant period fewer smaller cells are produced and growth eventually stops as the plant becomes dormant. The difference in size of the xylem cells laid down at the start and later in the growing season forms a line within the [wood](#) marking the boundary of an annual ring. The size of the xylem cells is also affected by the growing conditions. Hence changes in the width of annual rings can indicate changes in the climate.

Annular - ring-like.

Annulate - ringed or banded.

Anther - the male part of a [flower](#) producing [pollen](#), usually on a [filament](#). Anther and filament together are described as a [stamen](#).

Antheridium - Pl. antheridia- the structure on the [pteridophyte](#) (fern) [prothallus](#) that produces the mobile male gametes.

Anthesis - the action of opening a [flower](#) or period of time during which a flower is open.

Anthocyanin - pink, purple, violet or blue water-soluble pigments colouring [leaves](#), [flowers](#) and other parts. These pigments are sensitive to acidity or alkalinity (pH) turning red in acid and blue in alkali. Anthocyanins and [betalains](#) never occur in the same plant.

[Structure of anthocyanin](#).

Antibiotic - a substance that destroys or inhibits the growth of bacteria and other microorganisms.

Apex - the top part of a [plant](#) or structure, the growing point.

Apical - located at the tip or highest point.

Apical dominance - inhibition of lateral [bud](#) development along a shoot by the terminal bud or growing point.

Apical [meristem](#) - the un-differentiated tissue at the tip of a shoot or root, that by division produces the precursors of the differentiated tissues, including [vegetative](#), reproductive or [floral](#) organs.

Apophysis - an offshoot or projecting part.

Apothecium - a cup-shaped [fruiting](#) body produced by some lichens and fungi.

Appressed - turned upwards and lying closely, flat against something e.g. [spines](#) of some cacti.

Aquatic - growing in water.

Aquifer - a geological formation of permeable material that can store, transmit and supply water to a well or spring.

Arachnoid - cobweb-like, with soft entangled [hair](#).

Arborescent - [tree](#)-like in size and growth habit.

Archegonium - Pl. archegonia- the structure on the [pteridophyte](#) (fern) prothallus that produces the sessile female gametes.

Areole - a modified side-shoot growing in the [leaf](#) axil, typically as a felted or multi-[spined](#) cushion, unique to the [Cactaceae](#). From this point, spines, [flower buds](#), [stems](#), roots or offsets may arise. In most species, the areole is located on the [tubercles](#) or [ribs](#). The areole is constructed so that breaking [spines](#) off the [plant](#) does not injure the underlying tissue.

Argentatus (-a -um) - silvered.

Argenteo - silver - as part of a compound word.

Argenteus (-a -um) - silvery.

Argentinus (-a -um) - from Argentina.

Aril - an outer covering, or sometimes merely an appendage, of a [seed](#) formed from the [funicle](#). May be hard, [waxy](#) or [pulpy](#).

Arista - an awn or bristle.

Aristate - with an awn or bristle.

Aromatic - with a resinous, spicy or distinctive smell.

Articulate - jointed or with points of apparent separation, usually marked by a swelling, line or sudden change in colour. Hence: Articulata - with joints.

Ascending - growing upwards.

Asclepius - (Latin: *Aesculapius*) - the ancient Greek mythical god of healing from whom the name of the [family Asclepiadaceae](#) is derived. The *Asclepiadaceae* have recently been subsumed under *Apocynaceae*. [More about Asclepius](#)

Ascomycete - a large group of [fungi](#) including yeasts, mildews and truffles, with hyphae divided by septa and producing [spores](#) sexually within a typically cylindrical [membrane](#) forming a spore case or sac (ascus).

Asexual - without the involvement of fertilisation, propagation by division or the production of bulbils, offsets or stolons.

Aspera - rough to the touch.

Astringent - with a soapy or medicinal aroma because of the presence of saponium or other chemicals

Atropine - a poisonous, bitter [alkaloid](#) extracted from members of the plant family *Solanaceae* such as *Atropa belladonna* (deadly nightshade), *Datura stramonium* (Jimson weed), *Hyoscyamus niger* (Henbane) and *Mandragora officinarum* (mandrake). Atropine dilates the pupils, increases heart rate, and reduces salivation and other secretions by inhibiting binding of acetylcholine to acetylcholine receptors. It is useful medicinally, including as a cardiac stimulant and a treatment for organophosphate poisoning. Cleopatra is said to have used an extract from Henbane to dilate the pupils of her eyes.

[Structure of atropine.](#)

Atropurpurea - deep magenta.

Attenuate - gradually narrowed or tapered.

Aurantica (-is, -um) - orange.

Aurea (-a, -um) - golden.

Auriculate - ear-shaped.

Autotrophic - nutritionally independent of other organisms. Self-feeding.

Auxin - a group of [plant hormones](#) such as indole acetic acid, produced by the tips of growing shoots in plants, that regulate the amount, type, and direction of plant growth by stimulating elongation of cells rather than cell division. Auxins diffusing down the [stem](#) away from the growing point produce concentration gradients that are responsible for apical dominance and phototropism. At the correct concentrations, auxins induces growth and fruit production even if the plant hasn't been pollinated (e.g. seedless watermelon). Commercially, auxins are used to promote root growth from cuttings, to promote uniform [flowering](#), and to set fruit and prevent premature fruit drop.

Synthetic auxins such as 2,4-D and 2,4,5-T stimulate uncontrolled DNA and protein synthesis and are effective herbicides. 2,4-D is still used as a herbicide but use of 2,4,5-T has been banned because it tends to be contaminated with carcinogenic dioxin. Broad-leaved weeds like dandelions are much more susceptible to auxins than narrow-leaved plants like grass and cereal crops. At extremely low concentrations, 2,4-D is used to promote growth of orchid seedlings.

Auxotroph - Auxotrophic - of an organism unable to synthesise a particular **organic** compound required for its growth.

Axil - the upper notch or angle between the axis and any organ such as a **leaf**. Hence, "axillary bud" is a **bud** in the leaf axil.

Axial System - the **vascular** elements running vertically up and down a **stem**, in contrast to the lateral system running horizontally or out to the margin of the stem. The axial system carries water and minerals up the stem in the xylem and carries glucose up and down the stem in the phloem.

Azureum - light blue.



B

Baccate - like a **berry**.

Bacciferous - bearing **berries**.

Bale - a standard bundle of agricultural merchandise such as straw, cotton or paper usually pressed or bound. The volume and weight of a bale depends on the commodity and locality.

Barbate - bearded or bearing tufts of long, weak **hairs**.

Barbed - bearing sharp, **spine**-like hooks which are bent backwards.

Bark - the protective exterior covering of the roots, **stems** and **branches** of **woody plants**, exterior to the **cambium** and including an inner layer of secondary **phloem**.

Barleycorn - a traditional English unit of length equal to one third of an inch. Use of **seeds** as average units of weight or length was common in societies based on agriculture. In the Anglo-Saxon era, barley was an important subsistence crop and barleycorns were used as units of length. Three barleycorns 'smooth and round laid end to end' were equal to the Saxon ynce (inch). Barleycorns, or grains, became the basis of all English weight systems.

Barren - sterile or otherwise incapable of reproducing.

Basal - at or referring to the base of any structure.

Basidiomycete - **fungi** including mushrooms, puffballs, rusts and smuts with hyphae divided by septa and that produce **spores** on a specialized club shaped cellular structure (basidium).

Basilaris - arising from the base.

Berry - a **pulpy** or fleshy **fruit** with one or numerous **seeds** embedded in the pulp.

Betaine - trimethylglycine - a quaternary ammonium compound with a sweet flavour found in sugar beet *Beta vulgaris*. Used for the treatment of muscular degeneration and metabolic disorders.

Betalain - a nitrogen-containing pigment characteristic of the [family](#) group *Caryophyllales* (*Centrospermae*) which includes the *Cactaceae*. Betalains are grouped as betacyanines (red-violet colour) and betaxanthins (yellow colour) and responsible for the red or violet colouration of some cacti under environmental stress. Betalain pigments are also found in some higher fungi. Betalains and anthocyanins never occur in the same plant.

[Structure of betacyanine](#) [Structure of betanin \(beetroot red\)](#)

Bi - two or twice, as a prefix.

Bicolor - with two different colours.

Biennial - a [plant](#) that typically lives two years from sowing, usually [flowering](#) in the second year.

Bifurcate - split in two.

Bilabiate - with two lips.

Bilateral - with equal sides eg bilaterally symmetric.

Binomial name - is used to describe each [species](#) according to the system devised by [Linnaeus](#). The name consists of the capitalised name of the [genus](#) followed by the name of the individual species e.g. *Euphorbia obesa*

Biopesticide - a pesticide comprising a biological control agent, which is usually pathogenic to the target species. An example of a commercially produced biopesticide is the bacterium *Bacillus thuringiensis* that kills only insects and not other animals. Its wide host range allows it to be marketed as a sprayable control for a variety of insects, but it may also kill unrelated desirable insects.

Bisaccate - having two little bags, sacs or pouches.

Blade - the expanded portion of a [leaf](#) or petal.

Bombycinus - silky.

Bostryx - a branching stem in which the daughter axes are all on one side. e.g. a [raceme](#) in which the flower stalks ([pedicels](#)) are all on one side.

Brackish - a mixture of salt and fresh water with intermediate salinity.

Bryonine - a yellowish-brown bitter [alkaloid](#) obtained from the root of White Bryony (*Bryonia dioica*). Extracts of the root have been used medicinally as an emetic and purgative but the toxicity of bryonine makes its use dangerous. However, it is still used in animal husbandry.

Bract - a reduced or modified [leaf](#) subtending an axis. Often found at the base of a [flower](#) or flower cluster and may form a cup around the flower in e.g. *Compositae* or may be brightly coloured and resemble petals in e.g. *Poinsettia*.

Branch - a natural division of a [stem](#) or [trunk](#), especially a secondary stem growing off the main stem or trunk.

Bud - an unopened [flower](#) or a growing tip surrounded by its immature perianth segments or leaves.

Bud imprint - the outline of the margins, teeth or other features of one [leaf](#) impressed on another [leaf](#) while the two leaves are pressed together in the [bud](#) and remaining as a permanent marking after the leaves become separated. This effect is particularly marked in certain species of *Agave*.

Bulb - an underground food and water storage organ consisting of a short stem with one or more buds surrounded by modified [leaves](#) (scales).

Bulbil - a small [vegetatively](#) derived [plant](#) produced on an [inflorescence](#).

Bush - or [shrub](#) - a low, often woody, [plant](#) normally branching from the base, rather than having a single [stem](#) that [branches](#) higher up. Also applied to a thicket or to an area covered with [trees](#), bushes or scrubby vegetation in e.g. Australia or South Africa, or generally to any wilderness area.

Bushel - an English Imperial measure of volume, of a container or basket used to measure such a volume, typically used to measure dry goods such as grain or fruit. Such a cylindrical container would be 18.5 inches in diameter and 8 inches deep. A bushel = 4 pecks, 8 English gallons (defined as the Winchester bushel by King Edward 1 in 1303), 1.2844 cubic ft, 2219.36 cubic inches (Metric: 36.369 liters). A heaped bushel is traditionally 27.8 percent larger than a regular or struck bushel which has been leveled. Agricultural goods such as grain are traditionally sold by the bushel, but as they tend to settle during shipping disputes over volumes delivered can arise. Therefore bushels of a particular commodity are defined as standard weights, often enshrined in law and it is really the weight of goods that is sold rather than the volume.



C

Cactus - (Greek: *kaktos* = a prickly [plant](#) (Spanish artichoke) from Sicily) - A [spiny](#), [succulent](#), [dicotyledonous](#) plant of the [family](#) *Cactaceae* (Linnaeus 1737) native mainly to arid regions of North and South America, although some species are rainforest epiphytes. The fleshy stems and [branches](#) are characteristically furnished with tufts of [hairs](#) or spines coming from a common [areole](#), a structure unique to this [family](#). Only a few species of cacti have leaves. In the majority of species, photosynthesis is carried out on the green surface of enlarged stems that also serve as water storage organs.

Cactiform - with the growth habit of a dwarf cactus, having a ribbed or tuberculate green stem that is not much taller than wide.

Cactine - an alkaloid supposedly present in some *Cactaceae* such as *Selenicereus grandiflorus* but of doubtful reality. Cactine is said to have a digitalis-like action on the heart and to have diuretic properties.

Caducous - falling off early.

Caerulea (-is, -um) - blue.

Caespitose - forming a cluster or clump of [stems](#) by repeated branching of the stem above ground, at or near the base of the [plant](#). Of [plants](#) that offset freely to form a large clump.

Caffeine - a methyl-xanthine [alkaloid](#) occurring naturally in some [plants](#) used to make beverages and foods including *Coffea arabica* berries (coffee), *Thea sinensis* leaves (Tea), *Cola acuminata* nuts (Coca Cola), *Themobroma cacao* beans (chocolate) and added to a wide range of manufactured foods. Caffeine is one of the most widely used mood-altering drugs and has probably been used through the whole of human history.

Calcarate - with a spur.

Calcicole - growing only in limestone soils

Calcareous - chalky, derived from limestone, or with an excess of lime.

Calcifuge - a [plant](#) unable to stand chalky (limy) soil.

Callus - a tissue composed of large thin-walled [cells](#), usually produced in response to injury.

Calyptra - a hood or covering over the [calyx](#) or other part.

Calyx - a small [whorl](#) of modified leaves (sepals) at the base of a [flower](#) and, where present, enclosing the other parts of the [flower](#) in [bud](#). These may occur individually or joined into a cup or tube and may be of any colour, but commonly green.

CAM metabolism - Crassulacean Acid Metabolism - a metabolic adaptation allowing temporary storage of carbon-dioxide as [organic](#) acids (e.g. malate) and later release of carbon-dioxide, by decarboxylation of these acids, for fixation into sugars. This allows uptake of carbon-dioxide during the cool nights, when water loss by [transpiration](#) is relatively low, while providing a store of carbon-dioxide for [photosynthesis](#) during the day. C-4 metabolism is typical of *Agaves*, *Cactaceae*, *Crassulaceae*. > Tropical grasses use a similar C4 pathway to support high rates of growth under optimum conditions.

Cambium - a layer of tissue giving rise to secondary growth in [stems](#) and roots by [cell](#) division. Seasonal growth within the cambium produces [annual growth rings](#). The [corky bark](#) of the cork oak [tree](#) is formed from cambium cells.

Campanulate - bell shaped, applied to the shape of a [flower](#).

Canadensis - from Canada, or sometimes more loosely applied to originating from the northeastern USA.

Canariensis (-e) - from the Canary Islands.

Candida - white.

Cane - a long [woody](#) pliable [stem](#) arising from the ground.

Canescence - a dense covering of very fine white or gray short [hair](#).

Canopy - the foliage cover of a [plant](#) community especially woodland.

Caperatus (-a, -um) - wrinkled.

Capillaceus (-a, -um) - slender, [hair](#)-like.

Capillatus (-a, -um) - with [hair](#).

Capitulum - pl. capitula -

i. a dense flat or globular cluster of [sessile flowers](#) or [foliage](#) e.g. [inflorescence](#) of clover, cauliflower, daisy and dandelion, head of lettuce.

ii. a dense [fruiting spike](#) of a cereal plant such as corn.

iii. the upper [branches](#) and [foliage](#) of a [tree](#) forming the [crown](#)

iv. any part forming a knob-like protruberance.

Capsule - a dry multi-chambered [seed](#) pod with many seeds per chamber that splits along several seams to open when dry and ripe.

Carbohydrate - a diverse group of large food storage molecules formed by linking sugar monomers into [polysaccharide](#) chains by glycosidic bonds.

Cardinalis (-a, -um) - red.

Carinate - keeled.

Carmine - a precipitate of [cochineal \(carminic acid\)](#) made by adding alum, cream of tartar, stannous chloride, or potassium hydrogen oxalate to a solution of cochineal. Sometimes proteinaceous substances such as egg white, fish glue or gelatine are added before precipitation. Carmine is used as a food dye, to colour alcoholic beverages, as a pigment in microbiology and in crimson ink.

Carmine lake - a pigment obtained by adding freshly precipitated alumina to a solution of [cochineal \(carminic acid\)](#).

Carotenoid - Carotene - a class of violet to orange or yellow fat-soluble unsaturated hydrocarbon pigments, usually with 9 conjugated double bonds, found in most higher [plants](#) and responsible for the colour of carrots, squashes and sweet potatoes. Carotene assists photosynthesis by transmitting energy from absorbed light to [chlorophyll](#).

Dietary carotene is converted to Vitamin A in the liver of animals, which are unable to synthesise their own, and becomes concentrated in fat and [cell membranes](#) where it acts as an antioxidant. Carotene may cause a yellowish colour in people who consume large amounts in their diet. Carotene pigments extracted from plants are used to colour foods such as cheese and margarine.

The oxygenated derivatives of carotenes are known as [xanthophylls](#).

Carpel - female reproductive part of [flower](#) including [ovary](#), [style](#) and [stigma](#), which may be solitary, grouped or fused.

Caruncle - an outgrowth on a [plant](#) or animal such as a fowl's wattle or a protuberance near the hilum of certain [seeds](#).

Caryopsis - a dry, [indehiscent seed-like fruit](#) with a thin [pericarp adnate](#) to the seed coat, typical of cereal grasses e.g. wheat.

Cataphyll - a poorly developed [leaf](#) whose primary function is other than [photosynthesis](#). e.g. [cotyledon](#), scale leaf. In [Cycads](#), cataphylls protect the apical meristem and are often produced prior to the emergence of leaves or cones.

Catkin - a cylindrical spike-like **inflorescence** consisting of a cluster of scaly **bracts**, often pendulous and unisexual.

Caudex - a swollen base to the **stem** and upper part of the root system used as a storage organ.

Caudiciform - of **plants** with a **caudex**.

Cell - the basic structural unit, which may be capable of replication or **differentiation**, from which all living tissues are made. Hence: Adj. **cellular** made from cells.

cell_wall - the rigid semi-solid layer surrounding a **cell**, protecting the interior from physical damage and resisting expansion from **turgor pressure**. Found in **plants** and many micro-organisms and constructed from a variety of materials:

Plant cell walls are constructed from a matrix of insoluble **polysaccharides** including **cellulose**, **hemicellulose** and **pectin**.

Algal cell walls contain cellulose and glycoproteins and a variety of other polysaccharides including alginic acid and sulphonated polysaccharides. Diatoms synthesise distinctive crystalline silicic acid walls from orthosilicic acid.

Fungal cell walls contain cellulose and **chitin**.

Bacterial cell walls, especially those of Gram Positive species contain peptidoglycan, a polymer of N-acetyl muramic acid and archaebacteria contain pseudopeptidoglycan N-acetyltalosaminuronic acid.

Cellulose - the major constituent of **plant cell walls** and probably the most abundant **organic** substance on earth with about 10^{11} tons synthesised each year. Cellulose consists of beta-D-glucose units linked together with beta-1,4' linkages (compare with **starch**) into very long, high molecular weight **polysaccharide** molecules (typically up to several million kDa). Up to 50% of the carbon content of plants may be cellulose.

Central - positioned at or near the centre of an area, as opposed to being peripheral in position. A **spine** originating in the centre of an **areole** as opposed to those growing around the edge of the areole.

Cephalium - modified **flowering** zone of **stems** of certain **species** of cactus, often ornamented by copious development of **hairs** or bristles. In some species (e.g. Melocactus) **stem** growth ceases once the cephalium is produced. In others, a **pseudocephalium** is produced while **stem** growth continues.

Cereus - **wax**-like, candle-like.

Cereiform - with the growth habit of a **cereus**, having elongated, cylindrical and usually ribbed green stems.

Chamber - a hollow space. Hence: Chambered - with hollow spaces.

Character - a characteristic trait or feature sufficiently unique to be of value in distinguishing forms and defining relationships.

Charcoal - an amorphous form of carbon produced by partially burning or oxidizing **wood** or other vegetable material in fires from which air is partially excluded by covering with cut turf, or in large kilns in the absence of air. Uses include drawing material, as a fuel, filter, gas

absorbent, etc.

Chartaceous - of or like paper or parchment. Usually not green.

Chartreuse - yellow-green.

Chasmathum (-a,-us) - with wide-open, gaping, [flowers](#). Chemotropism - bending, growth or movement of a part under the influence of a concentration gradient of chemical substances.

Aerotropism- special case of a response to oxygen.

See also: [Tropism](#).

Chimera - the combination of tissues of different genetic origin in the same part of a [plant](#).

Examples of chimeras include some variegated cultivars of *Sansevierias*, although there can be many reasons for variegation.

Chinosol - 8-hydroxyquinoline sulphate, used as a fungicide and soil sterilant. This compound may inhibit seed germination and show some toxicity to seedlings.

Chitin - may be the second most abundant [polysaccharide](#) in nature, after [cellulose](#) to which it is structurally related, but see also [lignin](#). At least 10⁹ tons of chitin are thought to be synthesised each year. Chitin is found in the [cell walls](#) of many lower [plants](#) such as yeast, mushrooms and other [fungi](#). It also forms a substantial part of the exoskeleton shells of crustaceans, such as crabs shrimps and lobsters, as well as in the exoskeletons of marine zoo-plankton, including coepods, and in corals and jellyfish. Insects, such as butterflies and ladybird beetles, have chitin in their wings.

Chitin mainly consists of the amino-sugar N-acetyl-D-glucosamine linked together with beta-1,4' linkages, which may be partially deacetylated to a form of chitin called chitosan. Chitin is usually found complexed with other polysaccharides and proteins.

Chloranthus - with green [flowers](#).

Chloro - (Greek: chloros = yellowish-green) green, as a prefix.

Chlorophyll - (Greek: *chloros* = yellowish-green) the green metallo-pigment in [plants](#) concerned with harvesting energy from light and transmitting the energy to an ordered chain of enzymes, ultimately responsible for the production of sugars. Each chlorophyll molecule contains a central magnesium atom chelated by four nitrogens from a large porphyrin ring and the two forms may be distinguished by substitution of a methyl group in chlorophyll a for an aldehyde in chlorophyll b. [Structure of chlorophyll](#)

Chloroplast - a specialised [cytoplasmic](#) organelle containing [chlorophyll](#), characteristic of [plants](#), and responsible for using energy captured from visible light to fix carbon from carbon-dioxide and synthesise carbohydrates as energy storage molecules. Like [mitochondria](#), chloroplasts contain a small amount of [DNA](#) which encodes genes for a few chloroplast proteins.

Chlorosis - yellowing of plant tissue caused by many factors, often nutritional imbalance or poor illumination.

Cholla - any member of the [genus](#) *Opuntia* with short cylindrical-[stems](#).

Chromoplast - a specialised [cytoplasmic](#) organelle containing pigments other than [chlorophyll](#)

including yellow or orange carotenoid pigments.

Chromosome - tiny condensed X or Y-shaped sub-cellular bodies seen at the time of cell division, containing the genetic material (DNA) in the cell nucleus in association with packaging proteins such as histones. The number of chromosomes is usually constant for a particular species and species with different numbers of chromosomes may have difficulty hybridising.

Chrysantha (-us,-um) - golden.

Chrysocentrus - with a golden center.

Ciliate - fringed with very fine hair-like filaments.

Cincinnus - a branching stem in which the daughter axes are alternatively to the right and left. e.g. a raceme in which the flower stalks (pedicels) are alternatively to one side or the other.

Cinerea (-us,-um) - smoky gray, ashen gray.

Citrina - yellow.

Clade - A group of organisms with common ancestors, therefore sharing similar characteristics.

Cladistics - a method of classification of organisms based on their common ancestry and exploring their relationships within the branching evolutionary family tree or cladogram.

Cladogram - a graphical representations of the evolutionary divergence of species or related groups of species (clades) from common ancestors.

Cladophyll - Cladode - A leaf-like flattened photosynthetic stem or branch that resembles and functions as a leaf. Typical of epiphytic cacti e.g. *Epiphyllum*, *Zygocactus*

Class - a taxonomic group containing one or more Orders, ranking below Phylum or in botany, Division.

Clavate - club shaped. Elongated, with a gradual increase in diameter or increasing abruptly near the top.

Cleistogamous - of flowers that do not open, but nevertheless set seed by self-pollination.

Cloche - a glazed structure used to protect delicate plants from rain, wind and cold.

Clone - a plant which is genetically identical to its parent, produced vegetatively by offsetting, bulbils, cuttings or by *in vitro* propagation from meristem tissue.

Coalescent - growing together.

Coccineus (-a) - scarlet.

Cochineal - a red anthroquinone dye (carminic acid) made from a domesticated scale insect (*Dactylopius coccus*) and related species that live on prickly pear cacti (*Opuntia* species). Carminic acid is produced by the scale insect as an effective repellent for other insects such as

ants. This dyestuff was used in pre-Hispanic Mexico for dyeing textiles. Although superceded by synthetic aniline dyes such as alizarin from the 1870's onwards, cochineal is still an important food colourant and used for dyeing textiles in folk art. [Carmine](#) is a precipitated form of cochineal.

[Structure of carminic acid](#) [Cochineal bottle](#)

Coelestina (-us, -um) - pale (sky) blue.

Colliculate - covered with small, rounded or hill-like elevations (colliculae) e.g. surface of [seeds](#).

Coloratus - coloured, usually with a reddish tint.

Colpa - traditional Irish measure, originally a unit of livestock equal to one cow or horse or 6 sheep. Later adapted to specify a quantity of land which can support a horse or a cow for a year, approximately equal to an Irish acre of good land.

Colpus - an elongated aperture or groove with a length/breadth ratio > 2 in the wall of [pollen](#) grains. Hence: colpate = grooved.

Coma - a tuft of [hair](#), usually terminal, especially on a [seed](#) tip. A tuft of [leaves](#) or [bracts](#).

Commensal - literally "eating at the same table"- an organism that lives on or with another without harming it. See also [parasite](#), [symbiosis](#).

Compacta - compacted, compressed.

Complete - with all parts - of a [flower](#) with sepals, petals, stamens and pistils

Composite - a [flower](#) head composed of many small flowers, characteristic of [Asteraceae](#).

Compost - decomposed vegetation, used to improve the soil in gardens.

Compound - with two or more like parts. Of leaves with several similar parts or lobes forming the whole. Of a flower head with outer [ray florets](#) forming "[petals](#)" surrounding the inner [disc flowers](#), as in [Asteraceae](#).

Compound leaves - [leaves](#) divided into two or more [leaflets](#).

Compressa - flattened or pressed together.

Concolourous - coloured uniformly throughout, the same colour on both sides.

Conical - shaped like a cone.

Confluent - blending together or coalescing.

Connate - of similar parts growing from one base, joined or united to a single structure.

Connivent - coming close together or touching without joining.

Contact pesticide - a chemical that injures or kills insects which come into contact with it and

does not have to be ingested to be harmful.

Copal - a resinous substance exuded from some [species](#) of tropical [trees](#) and hardening in air into a glassy solid ranging in colour from red to yellow or brown.

Cordate - heart-shaped, with the point away from the [stem](#) and the [petiole](#) at the broader, notched end.

Cork - (periderm) specifically the soft, low density [bark](#) of the cork oak [tree](#), composed of [cambium cells](#). Cork contains a natural [wax](#), suberin, which protects the tree from water loss. The [stems](#) of many [succulent plants](#) harden and go brown with age and are often referred to as "corky".

Corm - a flattened fleshy underground [stem](#), often acting as a dormant resting stage, capable of producing [stems](#) from the base and top and leaves and [flower](#) stems from the top.

Corolla - the collective group of [petals](#) which may occur separately or fused into a cup, tube or other structure.

Corona -

i. outgrowth of the [perianth](#) e.g. trumpet of a daffodil

ii. a ring of raised fleshy tissue on the [corolla](#) around but not [adnate](#) to the base of the [stamens](#).

Cortex - a soft layer of tissue between the [woody vascular](#) tissue and [epidermis](#), or external layer such as [bark](#). Hence: *Adj.* Cortical.

Corymb - (Greek: *korumbos* = summit) a flat-topped or convex [inflorescence](#) with individual [pedicels](#) ([flower stalks](#)) branching from various points on the main [stem](#). The outer or lower flowers open first, progressing from the margin inwards, and have the longest stalks so all flowers reach a similar height.

Cosmopolitan - distributed world-wide.

Cotyledon - 1. the first embryonic leaf or leaves in the [seed](#). In some [plants](#) the cotyledons remain underground in the seedcoat.

Cotyledon - 2. a genus of [succulent plants](#) within the Family *Crassulaceae*.

Cotyledonosis - See: [Krimpsiekte](#)

Cotyledoside - a neuro-toxic bufadienolide cardiac glycoside: *7beta,8-epoxy-14-hydroxy-2alpha,3beta-(tetrahydro-3,5-dihydroxy-4-methoxy-6-methyl-2H-pyran-2,4-diyldioxy)-5alpha-bufa-20,22-dienolide*

found in certain members of the Family *Crassulaceae*, especially in the genera *Tylecodon* and *Cotyledon*. Livestock ingesting plants containing Cotyledoside may develop a wasting disease, [Cotyledonosis \(Krimpsiekte\)](#)

See: [Structure of cotyledoside](#)

Creation - most cultures subscribe to a legend that the earth or universe was created in a relatively short period of time by a supernatural power, together with all existing [species](#) (presumably including the *Cactaceae* and all other [succulent plants](#).)

Compare with [evolution](#).

Crenate - with rounded teeth or notched edges.

Crenulate - with shallow-toothed edges.

Crisped - with wavy, curled or crumpled margins.

Crispus (-um) - with wavy, curled or crumpled margins.

Cristate - crest-shaped or crested. An abnormal form of growth resulting from lateral distortion of the growing point.

Crown - the part of a [tree](#) above the first branching. The area from which new shoots arise or the point at which the roots meet the [stem](#).

Cruciform - shaped like a cross.

Cryptogam - lower [plants](#) reproducing by [spores](#) rather than [seeds](#), e.g. ferns, mosses, [fungi](#) etc.

Cucurbitacin - a toxic steroid developed by some plants, especially in the [Family Cucurbitaceae](#) as a defence against herbivores. Cucurbitacin is one of the most bitter tasting substances known. Some analogues have been shown to be toxic to cancer cells.

[Structure of Curcurbitacin](#)

Cultivar - a [plant](#) originated or selected artificially. Names of cultivars may be appended after the [species](#) name, (e.g. *Lithops bromfieldii* "Sulphurea") sometimes following the letters "cv."

Cultural requirements - the conditions which provide optimal growth of a [plant](#) in cultivation.

Cuneate - wedge-shaped with straight sides converging at the base.

Curare - a group of structurally related [alkaloids](#) that cause paralysis of the voluntary muscles by blocking acetylcholine receptors, when injected into the bloodstream and which are used as arrow poisons by South American tribal hunters. Curare is used medicinally as a muscle relaxant and as a treatment for tetanus.

d-tubocurarine - one of the most toxic [alkaloids](#) in the curare group, produced as a secondary metabolite in *Chondrodendron tomentosum* (Curare Vine), family *Menispermaceae*.

[Structure of tubocurarine](#)

Curcumin - a brightly-coloured yellow polyphenol pigment prepared from the root of turmeric (lili haldi), a member of the Zingiberaceae (Ginger Family). Several related compounds are present in turmeric at lower concentrations. Turmeric is widely used as a food colouring (E100) and is an important constituent of Indian food to which it imparts both flavour and colour.

Curcumin is used in Indian Ayurvedic medicine and is said to have some activity against a wide range of medical conditions including arthritis, although little is absorbed from food. Curcumin has anti-oxidant and anti-inflammatory properties probably from inhibition of cyclooxygenases. In the presence of boric acid, Curcumin forms a red pigment (rosocyanine). This colour change is sufficiently sensitive and specific that it has been used as an analytical test for boron ions.

[Structure of Curcumin](#)

Curvospina - with curved [spines](#).

Cuticle - a thin [wax](#)-like waterproof layer, composed of [cutin](#), covering the [epidermis](#). The outer coat of the [seed](#).

Cutin - a [waxy](#), water-impermeable complex fatty substance impregnating the [cell walls](#) and as a separate layer, the cuticle, on the outer surface of the [epidermis](#).

cv. - abbreviation of "[cultivar](#)".

Cyathium - the cup-shaped [inflorescence](#) of a *Euphorbia* consisting of a cup-like [involucre](#) containing a single pistil (female flower) surrounded by male flowers, each contributing a single stamen. Variations on this occur with all-male or all-female flowers. The cyathium may be surrounded by brightly coloured bracts that give the appearance of a large flower.

Cycasin - a toxic glycoside - [methylazoxymethanol-β-D-glucoopyranoside](#) - found only in Cycads.

[Structure of Cycasin](#)

Cylindric - with a cylindrical shape.

Cyme - a flat-topped or domed [inflorescence](#) in which the central or [terminal flower](#) in the cluster opens first.

Cynarrhodium - a fleshy, hollow [fruit](#) enclosing [achenes](#), typical of Roses.

Cytokinesis - the process of division of a whole [cell](#), distinct from [karyokinesis](#) division of the cell nucleus.

Cytoplasm - the contents of the [cell](#) excluding the cell [nucleus](#).



D

Damping off - a potentially fatal fungal disease, usually of seedlings or cuttings.

Dasyacanthus - with dense spination.

Deciduous - shed periodically or annually or at maturity. Often applied to the seasonal shedding of leaves.

Decomposer - an organism ([fungus](#), bacterium etc.) that breaks down and digests the remains of other organisms.

Decumbens - lying on the substrate with an ascending apex.

Decurrent - of a terminal [spine](#) extended down the [leaf](#) margin.

Decussate - of [leaves](#) arranged on a [stem](#) in opposite pairs at right angles to adjacent pairs of leaves above and below to form four vertical rows of leaves. Crossed or intersected in the form of an X.

Deflexed - curved or bent back down on itself or towards the [plant](#) surface.

Dehiscent - splitting or bursting open along defined lines e.g of a fruit.

Dehydrate - to lose a high proportion of water content.

Deliquescent - a tendency to absorb moisture and become liquid.

Dentate - with sharp teeth perpendicular to the margin.

Depressed - flattened from above.

Desert - a very dry area that receives less than 10 inches (25 cm) of precipitation each year.

Dessicated - dried, wrinkled.

Determinate -

i. of a growing tip terminated by a [bud](#) or [flower](#) which may stop or limit growth.

ii. of sequential flowering from a central or [apical](#) bud to lateral or [basal](#) buds.

See also: [indeterminate](#)

Dichotomous - forking equally, divided into two parts e.g. double-headed [plants](#).

Dichotomous key - a systematic procedure for determining the identity of an organism (or other object) by making a series of binary choices, according to the characteristics of the object, each of which leads to other choices or to the correct name.

Dicotyledon - a large group of [flowering plants](#) with two [cotyledons](#) that initially emerge from the [seed](#). The *Cactaceae* are dicotyledons.

Differentiation - the progressive physiological and morphological changes in [cells](#), tissues, organs or the whole [plant](#) during development from [meristem](#) tissue to a [mature](#) or adult form. Differentiated tissues are usually more functionally specialised than undifferentiated ones.

Dimorphic - having two forms.

Dioecious - with male and female [flowers](#) on separate [plants](#).

Dioscorides - Pedanius Dioscorides 40 - 90 AD was a Greek physician in the Roman army, botanist and author of *On Medical Material* (Latin: *De Materia Medica*) a 5-volume pharmacopoeia of medicinal plants and medicinal substances contained in them, that remained influential until the 16th century, and a precursor to modern herbals.

In 1753, Linnaeus named the Yam Family '[Dioscoreaceae](#)', and genus of yams '[Dioscorea](#)' in honour of Dioscorides.

Diosgenin - a steroid sapogenin extracted from the tubers of *Dioscorea* (wild yam) species, especially *D. mexicana* and *D. villosa*. Diosgenin is used for the commercial synthesis of cortisone, pregnenolone, progesterone, and other steroid pharmaceuticals. Diosgenin also occurs in Fenugreek. [Structure of Diosgenin](#)

Diploid - having the basic two sets of chromosomes.

Disc [flower](#) -one of the multiple inner tubular florets on flower heads of *Compositae* (Sunflower family).

Dispersal - distribution, usually of [seed](#).

Dissected - deeply divided or cut into parts.

Distal - towards the unattached or developing end of an organ.

Distichous - of opposite leaf pairs arranged along the stem in two ranks or planes, so each pair is parallel to those above and below. The result is a [plant](#) with a flat appearance.

Division - a major taxonomic grouping and primary division of a Kingdom, as in Kingdom *Plantae*, ranking above [Class](#) in size. See also: [Phylum](#)

DNA - deoxyribonucleic acid- the genetic material, contained in the [chromosomes](#) of all [cellular](#) organisms and some viruses e.g. potato spindle tuber virus. An extremely long double-helical linear polymer in which the gene sequences are encoded as the order in which four types of nucleotide bases occur, each paired with a complementary base. Groups of three base pairs in a structural gene specify the code for the 20 types of amino acids (and one or two rare ones such as selenocysteine) that make proteins.

Other sequences encode control functions such as start or stop (transcribing a sequence) signals. Much of the DNA in many organisms consists of apparently non-coding or repetitive sequences of unknown function.

Doctrine of Signatures - a theory dating back to Dioscorides (AD 40 - 90) that herbs resembling body parts are useful in treating ailments of that part. This philosophy was expanded by numerous writers including Coles, Galen, Paracelsus and Böhme. Böhme (1575 - 1624) suggested in "*Signatura Rerum* = The Signature of all Things" (1621) that God marked plants with a sign or signature so that by careful observation their purpose could be determined. This signature could also relate to the type of place in which such plants grow. The common names of many plants (hepatica, liverwort, lungwort, spleenwort etc.) originate in this belief.

Dormant - in a temporary state of suspended activity. Not in active growth, but protected (e.g. [bud](#) scales) from environmental stresses.

Dorsal - on or attached to the back of an organ.

Drip tip - a sharp elongated point on which atmospheric water accumulates from dews, mists and rain until the water drop is large enough to fall off the tip, to the ground around the roots of the [plant](#). Drip tips are common on the leaves of tropical [trees](#) in areas of high rainfall and the [spines](#) of some *Cactaceae* also function in this way to scavenge moisture.

Drupe - a fleshy or pulpy [indehiscent fruit](#) with a thin outer skin, containing a single central hardened [stone](#) or pit containing a [seed](#) e.g. almond, cashew, cherry, date, elderberry, mango, olive, peach, plum. The hard, [lignified](#) stone originates as the [ovary](#) wall of the [flower](#).

Druse - roughly spheroidal crystalline (e.g. calcium oxalate) or colloidal inclusions within tissues.



E

Echinate - bearing prickles or [spines](#).

Echinocarpa - with spiny [fruit](#). Also [acanthocarpa](#).

Ellipsoid - a compressed or flattened sphere.

Elliptic, Elliptical - oblong with regular flattened ends.

Emarginate - with notched ends or tips.

Embryo - the new [plant](#) developing from the fertilised egg cell ([zygote](#)) in the fertilised [seed](#).

Endemic - originating from and confined to a specific, usually small, geographic area.

Endosperm - mass of nutrient tissue formed within the embryo sac.

Entire - with a continuous margin without teeth, lobes or indentations.

Ephemeral - a [plant](#) that completes its life-cycle in a very short time.

Epicalyx - a group of [bracts](#) below the [calyx](#), resembling a (second) calyx.

Epicarp - the outermost layer of the [pericarp](#) of a [fruit](#).

Epicotyl - the main axis of the [seed](#) embryo just above the [cotyledons](#) and continuing into the developing [stem](#) of the seedling.

Epidermis - the thin outermost protective [cell](#) layer, usually taken to include the [waxy](#) water-impermeable material ([cuticle](#)) overlying the living cells.

Epigeal - growing with one or more leaves above the ground. Germinating with cotyledons above the ground.

Epigenous - on or developing or growing on the upper surface of a part such as a [leaf](#)

Epiphyte - a [plant](#) (or other organism) that grows on another for support, without drawing any nutrients from it. Hence: Adj. *Epiphytic*.

Epithet - a descriptive adjective used as a noun forming part of the [binomial](#) botanical name of a species. e.g. *gracilis* = slender

Erectocentrus - with an erect central [spine](#).

Erinaceae - with a hedgehog-like appearance.

Erose - ragged, with irregular random indentations.

Escape - an exotic [species](#) spreading from cultivation and becoming established in natural habitats.

Estuarine - associated with estuaries or river mouths, usually in [brackish](#) conditions.

Ethnobotany - the study of the uses of [plants](#) by various human cultures.

Etiolate - leaves and/or [stems](#) that are unnaturally long, often with a change of colour from the natural shade of green to yellow or white, due to insufficient light.

Euphorbus - physician to King Juba II (ca. 50 BC- 19 AD) of Mauretania. King Juba was said, by Pliny the Elder (23-79 AD), to have named a [plant](#) (probably *Euphorbia resinifera*) that he discovered on Mount Atlas in Morocco as "Euphorbea" after his physician. This is generally considered to be the origin of the name of the [genus](#) *Euphorbia*. A variety *E. regis-jubae* of *Euphorbia obtusifolia* commemorates King Juba himself.

Evaporation - the process of conversion of a liquid into a vapour or gaseous form. This change of state absorbs energy- the latent heat of vaporisation.

Evergreen - remaining green and [leafy](#) throughout the winter or resting season.

Evolution - a process of selection originally described by Charles Darwin in "The Origin of Species", whereby organisms possessing one or more characteristics conferring increased fitness, tend to survive and proliferate more successfully than similar organisms without these features. [Natural selection](#) therefore occurs for organisms possessing these desirable characteristics, and their numbers increase disproportionately within the population. Evolution generally proceeds very slowly, by selection for very small differences in characteristics. However, occasional introduction of large beneficial (in terms of fitness) changes into the gene pool leads to *punctuated evolution* where major changes occur over relatively short times compared with the geological record. The [Cactaceae](#) appear to be a group of [plants](#) which have diversified relatively recently, with few, if any, authentic fossils. Compare with [creation](#).

Excrescence - an outgrowth or protrusion from the surface.

Exine - the outer layer of the [pollen](#) grain wall largely composed of the polysaccharide [sporopollenin](#) and resistant to attack by chemicals.

Exotic - introduced from another climate, country or region.

Exserted - of [stamens](#) or [pistils](#) exceeding the length of the [tepals](#).

Extinct - of a [species](#) which has completely died out. Species can also become "extinct in the wild" but persist in botanical or other collections.

Extinction - the process leading to complete loss of a species.



F

F1 - of progeny derived from a first generation cross between distinct individuals.

F2 - of progeny from self fertile F1 [hybrids](#).

Falcate - strongly curved or sickle-like.

Family - a taxonomic grouping of related [genera](#) with a similar [floral](#) pattern and other common characteristics, contained within an [Order](#)

Farina - a whitish mealy or flour-like covering. Hence: Adj. *farinose*, *farinaceus*.

Fasciation - malformation of a [stem](#) or other part usually with lateral flattening, cresting.

Fascicle - (Latin: *fasciculus* = small bundle) a small cluster or bundle of e.g. [branches](#), [flowers](#), [leaves](#), or [stems](#), or a bundle of [vascular](#) tissue. Of an inflorescence, a cluster of flowers in a leaf axil lacking an axis or cymose morphology. Hence: Adj. *fasciculate*: bundled or clustered.

Felt - a very thick layer of [hairs](#) or fibres.

Fertile - a [plant](#) with functional reproductive organs, producing [pollen](#) capable of fertilisation and [seeds](#) or [spores](#) capable of germination.

Fertiliser - a mix of essential nutrients supplied to [plants](#) to improve their growth or to correct a specific deficiency. For commercial fertilisers the proportions of Nitrogen:Phosphorous:Potassium are marked on the package as N:P:K ratios. [More information](#).

Fibrous root - finely divided [root](#) system without obvious thickening or an enlarged central root.

Filament - [stalk](#) of a [stamen](#) supporting [anther](#).

Flaccid - limp, flabby or drooping.

Flagellum - (Pl. flagella)- a whip-like [hair](#), usually motile in lower [plants](#) and plankton. Hence: Adj. *flagelliform* = whip-like, *flagellate* = a single cell form of plankton with a flagellum.

Flavescens - becoming yellow.

Flavispina - with yellow [spines](#).

Floccose - (of [plants](#)) having tufts of short soft woolly [hairs](#).

Flora - all the [plant species](#) in an area. A book or treatise on [plant](#) species from a particular region.

Floral - relating to, or resembling, or made from, or containing [flowers](#).

Floret - a small [flower](#), especially as one component of a dense multiple flower cluster.

Flower - the complex reproductive organ of an angiosperm [plant](#) which may include [sepals](#), [petals](#), [stamens](#) and [pistil](#). Flowers may include either male or female parts or both. The colourful parts of a flower and its perfume attract pollinators and guide them to the [nectary](#), usually at the base of the flower tube. Pollination usually occurs incidentally to foraging for nectar or [pollen](#) as food. [Xerophytic](#) plants may have flowers that are produced and open in response to rain and produce [seed](#) within a few weeks of pollination, thus completing their life cycle. [Species](#) with tubular red flowers have often evolved to attract humming birds and other avian pollinators. Some night-flowering species have specialised to attract bats with [foetid](#) fleshy blooms or moths with large strongly-perfumed flowers.

See also: [catkin](#), [corymb](#), [cyathium](#), [cyme](#), [fascicle](#), [panicle](#), [raceme](#), [spadix](#), [spike](#), [thyrses](#), [umbel](#)

Flower head - a dense arrangement of [flowers](#) arising from a common point as in e.g.

Umbelliferae or *Compositae*.

Flowering plant - an [angiosperm](#).

Foetid - with an offensive stinking odour.

Foliage - the leaves of [plants](#).

Follicle - a dry dehiscent, many-seeded [fruit](#) derived from one [carpel](#) and splitting along one suture.

Forest - a [plant](#) community dominated by [trees](#) or other large plants e.g. large Aloes, Yuccas.

Form - the smallest degree of consistent differentiation between [plants](#) which may be formally named e.g. [spine](#) length or [flower](#) colour.

Fragilis - fragile, easily broken.

Fruit - the mature ripened reproductive body ([ovary](#)) of a [seed plant](#) which encloses the seed in fertile species of [plant](#). True fruits develop from the ovary wall. See: [pericarp](#). Many [fungi](#), myxobacteria (slime moulds) and [lichens](#) produce a fruiting body, a macroscopic reproductive structure enclosing the [spores](#). Fungal fruiting bodies often have distinctive sizes, shapes, and colours characteristic of each species.

See also: [achene](#), [apothecium](#), [berry](#), [capsule](#), [caryopsis](#), [cynarrhodium](#), [drupe](#), [follicle](#), [pepo](#), [pitahaya](#), [pome](#), [samara](#)

Frutescens - [shrubby](#).

Fulgida - glittering, shining.

Fulvous - yellow or tawny or yellow flecked with a mixture of grey or brown.

Fungus - (Pl. [fungi](#))- simple [spore](#)-producing eukaryotic [plants](#) that obtain energy and nutrients by breaking down other [organic](#) material and absorbing it through their cell walls. The [Kingdom](#) Fungi includes yeasts, moulds, mildews, mushrooms, rusts, slime moulds, smuts, and toadstools.

Funicle - the [stalk](#) of an [ovule](#) or [seed](#). The thread like tissue connecting the developing seed, via the [hilum](#), to the [fruit](#). (Latin: *funiculus* = little rope)

Furlong - English unit of length equal to 660 feet, 220 yards, 40 poles, 10 chains or one-eighth of an English mile (Metric: 201.168 meters). Literally a 'furrow long' from Old English *furlang*, the length of a single furrow that a horse could plough without stopping and hence the length of a medieval field. Still used in horse racing.

Furrowed - with parallel longitudinal grooves or channels.

Fuscous - dusky, blackish or a greyish-brown colour.

Fused - joined and growing together.



G

Galen - Aelius (Claudius) Galenus of Pergamon 129 - 216 AD was a renowned Greek physician, philosopher, anatomist and prolific author. His published herbal remedies incorporated plants from all over the (known) world, often based on earlier recipes and were an important influence in medicine into the 16th century. However, Galen's focus on the medicinal essences in plants provides little detail of morphology or taxonomy. Galen followed the Aristotelian doctrine of natural form following function, later expressed as the [Doctrine of Signatures](#).

Galvanotropism - bending, growth or movement of a part under the influence of an electric current.

See also: [Tropism](#).

Gamete - the male and female sexual cells that combine at fertilisation to form the [zygote](#).

Gametophyte, Gametophore - the part of the [plant](#) which bears the [gametes](#) or sexual cells. The haploid state of life of a sexually reproducing [plant](#).

Gamopetalous - ([sympetalous](#)), of a [flower](#) with the [petals](#) of the [corolla](#) more or less [fused](#), to form a tube or funnel.

Gelatinous - a slimy and sticky jelly-like substance with a water base.

Geminate - arranged in pairs.

Gene - an inheritable factor, carried on the [chromosomes](#), determining a [character](#) or trait in an organism.

Generic - pertaining to a [genus](#).

Genetics - the study of inheritance of [characteristics](#).

Genotype - the genetic [characteristics](#) of an organism.

Genus - (pl. Genera) a group of related [species](#) with sufficiently distinct unique [characteristics](#) in common to be treated as a separate unit. The name of the genus forms the first part of the [binomial name](#) of each species, and is always capitalised.

Geophyte - a perennial plant propagated by buds on underground bulbs, tubers, or corms that act as food storage organs and enable the plant to survive adverse conditions such as drought or Winter.

Geotropism - a growth response to gravitational forces causing bending, growth or movement of a part under the influence of a gravitational field.

See also: [Tropism](#).

Germination - the sprouting of a [seed](#). Development of a [spore](#).

Gibberellin - a group of [plant hormones](#) based on gibberellic acid produced by [seeds](#), mosses, ferns, algae and fungi. Gibberellins stimulate synthesis of nucleic acids and proteins and promote cell elongation, [meristematic](#) growth at the root and shoot tips, mobilisation of food

reserves in seeds and other processes. Their absence results in the dwarfism of some [plant](#) varieties. These relatively expensive chemicals have been used commercially in the production of seedless grapes and navel oranges and in [plant](#) micropropagation from tissue culture and have been found to reverse the effects of some herbicides. Compare with auxins which inhibit root growth in high concentrations.

Gibbous - swollen on one side, usually near the base, to form a pouch or sack.

Glabrous - smooth, without [hairs](#) or protrusions.

Gland - a multi- [cellular](#) secretory structure producing oil, resin or other liquid, usually as a protruberance or appendage, but sometimes as part of a surface.

Glaucous - bluish grey or bluish green often as a result of a [wax](#)-like bloom.

Epithets: Glauca - Glaucum - denote plants with glaucous foliage.

Glaucescence - a fine bloom, blush or coating of whitish or bluish-white substances, usually microscopic particles of [wax](#), easily rubbed off the surface.

Globose - spherical or spheroidal.

Glochids - [spines](#) or [hairs](#), usually small, brittle and barbed. Occurring in tufts and characteristic of *Opuntioideae*.

Glycoprotein - a diverse group of [proteins](#) which are modified by addition of short chains of typically 8-10 sugar residues covalently linked to their polypeptide structure.

Gracilis - slender.

Graft - a shoot, [bud](#) or other tissue joined to, and growing on, another compatible [plant](#).

Greenhouse effect - the trapping of heat from sunlight by atmospheric gases ([greenhouse gases](#)), including carbon dioxide, methane and water, which raises planetary temperatures above those expected from a simple model of heat radiation received from the sun and re-radiated into space. The high surface temperature on the planet Venus is caused by an extreme form of greenhouse effect.

Grey Water - effluent water suitable for use in gardens, from light domestic use for baths, showers, washing clothes or dishes and containing less nitrogen and less likely to be a disease vector than water from toilets.

Guard cell - one of two crescent-shaped [cells](#) which surround and control the opening and closing of the aperture of the [stoma](#) and thereby regulate passage of gases and water vapour through a [plant's epidermis](#).

Gum - material resulting from the breakdown of [plant cells](#) including their carbohydrates. On exposure to air, gums dry and harden.

Gummifera - bearing gum.

Guttation - exudation of liquid water from [plants](#).

Guttered - of [leaf](#) margins folded inward.

Gynoecium - the female part of the flower consisting collectively of the [carpel\(s\)](#) or [pistil\(s\)](#).

Gymnosperm - with naked or unprotected [ovules](#) ([seeds](#)) e.g. conifers, cone-bearing [plants](#) such as *Welwitschia*. Gymnosperms do not produce [flowers](#), but instead release [pollen](#) through the air to the female [ovule](#), causing fertilization.

Gynostegium - a crown of united [stamens](#) and [style](#) protecting the [gynoecium](#) and typical of milkweeds (*Asclepias*).



H

Habit - the general form and growth pattern of a [plant](#).

Habitat - the place in which a [plant](#), or other organisms, naturally grows or lives.

Hair - a long thin [epidermal](#) appendage, either formed from a single elongated [cell](#) or consisting of a single row of cells.

See also: [arachnoid](#), [barbate](#), [canescence](#), [capillaceus](#), [capillatus](#), [ciliate](#), [cephalium](#), [coma](#), [felt](#), [glabrous](#), [glochids](#), [hirsute](#), [lanate](#), [lasiacantha](#), [penicillate](#), [pubescent](#), [pubispina](#), [scabrous](#), [trichome](#), [villous](#), [woolly](#)

Hairy - with a covering of [hairs](#).

Half life - the time taken for the value of something to reduce to half of that value. Of a radioactive isotope, the time taken for half of the atoms to decay.

Halophyte - a [plant](#) adapted to, growing in and tolerating salty environments.

Haploid - having a single set of chromosomes.

Haptonastic - a movement response to a touch stimulus.

Hard Water - contains salts (usually calcium or magnesium) that interfere with formation of a lather from soap. Hard water used for irrigation of [plants](#) may leave white marks on foliage and the salts accumulate in the soil.

Hardwood - strong, dense [wood](#) from slow-growing broad leaved [trees](#).

Hardy - of a [plant](#) able to survive the extremes of climate, often taken to mean resistance to cold and frost.

Haulm - the collective [stems](#) or tops of crop [plants](#) (e.g. beans, peas, potatoes, grains, grasses) after the crop has been gathered, as used for bedding or thatching. Occasionally applied to a single stem.

Haustorium - (Pl. haustoria)- a specialised organ through which a [parasitic plant](#) absorbs nourishment from its host.

Heath - open land covered with low-growing [shrubs](#) such as heather.

Hectare - (ha) a metric unit of area equal to 100 Ares (2.471 acres) and equivalent to 10,000 square meters (107,639 square feet).

Hedge - Hedgerow - a border, fence or boundary formed by a row of closely planted [shrubs](#) or [bushes](#) often trimmed to a formal shape. The number of species forming a hedge tends to increase in proportion to its age.

Heel - a small portion of the previous year's growth at the base of a cutting.

Hemicellulose - heterogeneous mixture of [polysaccharides](#) resembling [cellulose](#), but of lower molecular weight and less complex. Hemicellulose is insoluble in hot water or with chelating agents, but can be extracted with dilute aqueous alkali. Present in almost all [plant cell walls](#) where hemicellulose binds with [pectin](#) to cellulose to form a network of crosslinked fibres, but found especially in woody tissues. Includes [xylan](#), glucuronoxylan, arabinoxylan, arabinogalactan II, glucomannan, xyloglucan and galactomannan.

Herb - a [vascular plant](#) lacking a [woody](#) structure.

Herbaceous - dying to the ground periodically or lacking a definite [woody](#) structure.

Herbivore - an animal that eats only [plants](#).

Hermaphrodite - with both male and female reproductive parts usually in the same [flower](#).

Heteromorphus - with an irregular or unusual shape or structure.

Heterotroph - an organism that can not make its own food and consumes other organisms to survive.

Heterozygote - with unlike [genes](#) on any particular pair of [chromosomes](#).

Hibernation - spending the winter months in a resting or dormant state.

Hilum - the small scar on a [seed](#) coat where it was attached to the seed pod by the [funicle](#).

Hirsute - pubescent, with coarse, stiff [hairs](#).

Holistic - of, concerned with, or dealing with whole or integrated systems rather than with their parts.

Holotype - the type specimen of a taxon as designated in the author's description.

Homology - having the same [phylogenetic](#) origin, but not necessarily identical form or function.

Homonym - a name that already exists for another [plant](#). The newest name is illegitimate and must be changed.

Homoplasy - of different [species](#) with similar characters that have evolved separately and are not from a common [phylogenetic](#) origin.

Homozygote - with identical [genes](#) on any particular pair of [chromosomes](#).

Hooked - with a straight basal portion and a tip curved into an arc.

Horticulture - the science of growing [plants](#) for decorative effect or for consumption as food.

Horizonthalonius - with a flat, level disc.

Hormone - a chemical substance produced in a [plant](#) tissue, capable of diffusing or transport to other parts where it's presence or gradients regulates specific functions such as [abscission](#), [differentiation](#), [flowering](#), growth and [tropisms](#).

Hort. - as part of a species name means "associated with gardens," "of garden or horticultural origin". Usually applied to a selected form or cultivar or hybridised so that the true origin is obscure.

Host - the organism on or in which a [parasite](#) lives and from which it derives its nourishment. Sometimes also used for the [plant](#) on which an [epiphyte](#) lives.

Humus - the [organic](#) component of soil, composed of partially or completely decayed [plant](#) and animal remains that provides nutrients for [plants](#) and increases the ability of soil to retain water.

Hyaline - translucent.

Hybrid - progeny from an inter-[specific](#) (or inter-[generic](#)) fertilisation, often of intermediate appearance to the parents.

Hydathode - a specialised gland or pore on the surface or [leaf](#) margin of higher [plants](#) that exudes water from the plant tissues or in some cases can absorb water on the leaf surface.

Hydrotropism - bending, growth or movement of a part in response to a water source.
See also: [Tropism](#).

Hypanthium - a cup-like, ring-like or tubular base of a [flower](#) carrying on its rim the [calyx](#), [sepals](#), [petals](#), and [stamens](#) and often [superior](#) to the [ovary](#).

Hypanthodium - an [inflorescence](#) composed of an aggregate of [flowers](#) on the inner fleshy wall of a concave [capitulum](#) e.g. *Ficus* or the characteristic flat "shield flowers" of *Dorstenia*.

Hyperplasia - an excessive multiplication of [cells](#).

Hypocotyl - the main axis of the [seed](#) embryo just below the [cotyledons](#) and continuing into the developing primary [root](#) of the seedling.

Hypodermis - a layer of cells below the [epidermis](#).

Hypogeal - happening, living or remaining below ground. Of the emergence of cotyledons below the surface of the ground or within the seed coat.

Hypogeous - below ground.

Hypostase - a basic substance, a group of specialised thick-walled cells between the ovule and the vascular bundle, a disk of woody, lignified tissue at the base of the ovule in some plant

families.



I

Idioblast - a special [cell](#) in a tissue which differs markedly in form, size or contents from other cells in the same tissue.

Imbricate - with overlapping edges.

Imperfect - [flowers](#) lacking either [pistils](#) or stamens.

Incumbent - resting or leaning upon. Also applied to a pair of [cotyledons](#) curving back down the [hypocotyl](#) so that the back of one is turned towards the hypocotyl and the back of the other is turned away from it.

Incurvispinus - with inwardly curved [spines](#).

Indigenous - occurring naturally in an area. Not introduced.

Indehiscent - failing to split open at maturity.

Indeterminate -

i. capable of continuing to grow at an apex or tip.

ii. of sequential flowering from lateral or [basal buds](#) to the central or [apical bud](#).

See also: [determinate](#)

Inermis - (Latin: unarmed) of a [plant](#) or plant part without spines or thorns.

Inferior - below another organ or part.

Inflorescence - a [flower](#) cluster, including bracts, on a [stalk](#).

See also: [catkin](#), [corymb](#), [cyathium](#), [cyme](#), [fascicle](#), [panicle](#), [raceme](#), [spadix](#), [spike](#), [thyrses](#), [umbel](#)

Inorganic - of molecules or chemistry based mainly on elements other than carbon.

See also: [Organic](#).

Insectivorous - trapping and obtaining nutrients from insects.

Integument - the covering of an [ovule](#) or other structure.

Intergrading - merging from one form to another by a continuous series of intermediate forms rather than divided into discrete sets.

Internode - part of a [stem](#) between two nodes.

Intertextus - interwoven.

Introse - facing inwards.

Involucre - a [whorl](#) of small leaves close underneath a [flower](#) or flower cluster.

Irradiance - the amount of light energy illuminating the Earth per unit area.

Irregular **flower** - a flower in which similar parts are unequal in size, form or extent of fusion as in e.g. *Leguminosae* (pea **family**). Often bilaterally symmetrical.

Isotropic - having the same property in all directions.



J

Joint - a point where a side-shoot or **leaf** grows out of a **stem**. A single section or segment of a stem composed of a series of units.

Juvenile - young or immature, not having flowered.

Juvenile leaves - the first set of leaves, especially when differing from the mature leaves.



K

Karyokinesis - the process of division of a **cell** nucleus, distinct from **cytokinesis** division of the whole **cell**.

Karyotype - the gross morphology of the chromosomes.

Kewensis - from the Royal Botanic Gardens, Kew. UK.

Kingdom - the highest grouping of similar organisms within the system of classification. Terrestrial life is divided into five Kingdoms: Animalia (animals), Plantae (**plants**), **Fungi**, Protista (protozoans and eucaryotic **algae**), and Monera (blue-green algae).

Krimpsiekte - **Cotyledonosis** - "shrinking disease" - a disease of livestock in Southern Africa, caused by consumption of plants from the genera *Tylecodon* and *Cotyledon* that contain bufadienolide cardiac glycosides such as **Cotyledoside**. These cumulative toxins cause symptoms of exercise intolerance, paresis, paralysis, torticollis, paralysis of the lower jaw and tongue, dysphagia, drooling of saliva, abdominal pain and convulsions followed by death within a few hours. Secondary poisoning occurs in humans and animals that eat contaminated meat from diseased animals. There are no significant lesions at autopsy.

[Structure of bufadienolide](#) [Structure of cotyledoside](#)



L

Labium - a lip.

Lacteus - milky.

Lamella - a thin plate or layer.

Lamina - the blade or expanded part of a **leaf**.

Lanate - with long, soft woolly **hairs**.

Lanceolate - shaped like a long narrow lance with a gradual taper from the base to the tip.

Lasiacantha - with shaggy or [hairy spines](#).

Lateral- growing or positioned at the sides.

Latex - a milky aqueous emulsion containing a variety of [organic](#) substances, often including [rubber](#) and various proteins. Commercially, latex produced from within [bark](#) of the rubber [tree](#) is coagulated by heat to produce natural rubber.

Laticifer - [cells](#) containing a characteristic milky fluid called [latex](#).

Leaf - an outgrowth from a node on a [plant's stem](#). Leaves come in many shapes and sizes, but are often flattened to maximise their surface area for capture of energy from sunlight ([photosynthesis](#)) using [chlorophyll](#) contained in [chloroplasts](#), thin to allow light to penetrate the [tissues](#) and oriented to optimise exposure to sunlight. In most plants, leaves also allow gas exchange, [guttation](#), [respiration](#) and [transpiration](#) to take place. Leaves can store food and water and may be modified for other purposes.

See also:

- leaf [blade](#): [simple](#), [compound](#), [palmate](#), [peltate](#), [pinnate](#), [scabrous](#), [trifoliate](#)
- leaf arrangement on the stem: [alternate](#), [decussate](#), [distichous](#), [opposite](#), [rosulate](#), [spiral](#), [whorled](#)
- leaf margins: [ciliate](#), [crenate](#), [crenolate](#), [dentate](#), [entire](#), [guttered](#), [serrate](#), [sinuate](#), [teeth](#)
- leaf tip: [acuminate](#), [drip tip](#), [emarginate](#), [hooked](#), [lanceolate](#), [mucro](#), [mucronate](#), [spatulate](#)

Leaflet - part of a [compound leaf](#).

Lectin - a diverse group of [plant proteins](#) capable of agglutinating cells (such as red blood cells). Lectins contain sites that recognise and bind to sugar residues, such as those included in the structure of [glycoproteins](#). [Ricin](#) is a notorious toxic lectin from the [seeds](#) of the castor oil plant.

Lectotype - a specimen selected from the original [type](#) material to serve as the [nomenclatural](#) type when a [holotype](#) was not originally designated, or is missing.

Leggy - of [plants](#) exhibiting excessive, rank growth, often caused by excessive watering, application of fertiliser or insufficient light.

Legume - i. a [fruit](#) with a single compartment that splits along two sutures or seams e.g. pea pod.

ii. a [plant](#) in the [family](#) *Leguminosae* (peas, beans) that can fix nitrogen from the soil due to the presence of symbiotic bacteria (e.g. *Rhizobium species*.) in root nodules.

Lenticel - a pore in [tree bark](#) through which gas exchange occurs.

Lenticular - shaped like a biconvex lens.

Leptocaulis - with slender [stems](#).

Liana - liane- a [woody](#), climbing vine.

Lichen - a complex differentiated organism formed by a [symbiotic](#) relationship between an [algae](#) and a [fungus](#).

Lignin - a diverse group of non-toxic [organic](#) polymers often associated with [cellulose](#) in the [walls](#) of many [plant cells](#), especially in [woody plants](#). In this form, lignin acts as a cement to exploit the strength of [cellulose](#) fibres, while allowing flexibility. The mechanical properties of this natural composite material (wood) compare favourably with many man-made composite materials such as fibre-glass. After [cellulose](#), lignin may be the second most abundant biopolymer in the world with an estimated annual production of 10^8 tons, but see also [chitin](#). Lignin is formed by the irreversible removal of water from sugar monomers to create phenolic aromatic structures. Polymerisation and extensive cross-linking occur to create very large three-dimensional lignin molecules. Sometimes lignin is isolated as a brown powder, but more often as a gummy mixture of lignins with a wide range of molecular weights. Lignin resists attack by most microorganisms, and anaerobic processes tend not to attack the aromatic rings at all. Aerobic breakdown of lignin is slow and may take many days. Hence, the presence of lignin strongly affects the bio-degradability of woody materials. The presence of lignin is demonstrated by a characteristic red colour on contact with sodium hypochlorite (bleach).

Linear - long and narrow with parallel or nearly parallel sides.

Linnaeus - Carolus Linnaeus (1707-1778) - a Swedish scientist who devised the [binomial](#) nomenclature used to identify every living species. The Linnaean System of classification is based on a simple hierarchical structure in which all known organisms are listed according to [Kingdom, Phylum, Class, Order, Family, Genus](#) and [Species](#).

Lithophyte - growing on rocks.

Littoral - growing on the beach.

Littoralis - belonging to the sea shore.

Lobe - partial rounded portion of a [leaf](#) or other organ, separated from the whole by a deep indentation that does not break the continuity of the structure.

Lobed [flower](#) - a tubular or funnel-shaped flower opening into petal-like segments.

Locule - individual compartment of an [anther](#), [ovary](#) or [fruit](#).

Loculicidal - longitudinally [dehiscent](#) along the [capsule](#) wall between the partitions of the [locule](#) so as to split it into two parts, as in the fruits of *Liliaceae*.

Lumen -

i. A pore or passage through a tubular structure.

ii. an internal cavity, space or void. e.g. cavity within the [plant cell cell wall](#).

iii. the SI measurement of light output (or luminous flux) used to label light sources as a measure of total light output. 1 lumen (lm) = 0.00146 W.

A unit of luminous flux equal to the amount of light given out through a solid angle of 1 steradian by a point source of 1 candela intensity radiating uniformly in all directions.

Lumper - colloquial - one who takes a broad view of a [genus](#), combining variant forms into individual [species](#).

Lutescens - yellowish.

Lycorine - a toxic [alkaloid](#) found in [Amaryllidaceae](#) (daffodil family) all members of which should be regarded as poisonous. Poisoning by daffodil bulbs, confused with onions, is fairly common. Symptoms of ingestion include salivation, vomiting, diarrhea, collapse and death, depending on the dose. Lycorine inhibits protein synthesis and cell division and is of interest as an anti-tumour agent.

[Structure of Lycorine](#)



M

Macrocentra - with a large central [spine](#).

Macromeris - with long or large divisions.

Macrorhiza - with long or large roots.

Macrozamin - a toxic glycoside - [methylazoxymethanol](#)- β -primeveroside - found only in Cycads.

[Structure of Macrozamin](#)

Macula - a spot or blotch. Hence Adj. *maculate* = with spots or blotches.

Maguey - the [Agave](#) or century plant, especially *A. americana* but includes several other species. Also applied to cordage and fabrics made from fibres of the Maguey plant.

MAM - a neurotoxin - methylazoxymethanol - found exclusively in Cycads as its glycosides as e.g. [Cycasin](#), [Macrozamin](#) and related compounds. MAM is released from the glycosides by enzymatic processing in intestinal bacteria. Hence the glycosides are only toxic after ingestion.

[Structure of methylazoxymethanol](#)

Mamilla - nipple-shaped tubercle with an [areole](#) at its tip.

Mamillate - with breast or nipple shaped projections.

Margin - the edge of a [leaf](#) or other organ.

Marginal - along the margin or edge.

Marine - of the sea or [saline](#) water.

Maritime - of the sea, coastal.

Marsh - a swampy waterlogged area, either fresh or [saline](#).

Matrix - a medium in which something is embedded.

Mature - applied to [cells](#) and tissues that have differentiated into their final adult form assuming the function or form characteristic of cells or tissues found in a fully developed part of the [plant](#).

Mayahuel - Aztec Goddess of [Maguey \(Agave \)](#), fertility, alcohol and [pulque](#). [Drawing of Mayahuel](#)

Median - in the middle or axial plane.

Medulla - soft internal tissues such as pith.

Megasporangium - Pl. Megasporangia - a structure in spore-bearing plants such as Cycads in which female megaspores are formed, similar to the [ovule](#) in seed plants.

Meiacantha - with smaller or fewer [spines](#).

Meiosis - a special type of [cell](#) division at the sexual stage of a life-cycle when the [diploid](#) or other normal [chromosome](#) number is halved in the production of haploid gametes.

Melanacanthus - with black [spines](#).

Membrane - i. a thin pliable sheet of material that separates and forms the interface between two environments.

ii. a thin flexible sheet of tissue connecting, covering, lining, or separating various parts or organs.

iii. a thin (10 nm) structured bi-layer of phospholipid and protein molecules surrounding every biological [cell](#) and intracellular [organelles](#) such as [chloroplasts](#), [mitochondria](#) and the cell [nucleus](#). Functionally distinct [proteins](#) floating in the membranes of cells and organelles control the passage of substances into and out of the enclosed space, catalyse chemical reactions at the membrane surface and allow cell-cell recognition.

Meristem - the growing tissue comprised of stem [cells](#) capable of repeated division and differentiation into permanent structures.

Mescal - a strong alcoholic liquor, similar to Tequilla, made by distillation of a fermented preparation of the [starchy](#) core of *Agave angustifolia* and other species. Also a common Mexican name for certain *Agaves*.

Mescaline - a halucinogenic [alkaloid](#) found in *Lophophora williamsii* and other [species](#) of cactus traditionally used in native American Indian religious ceremonies and medicine.

[Structure of Mescaline](#)

Mesembrine - a narcotic [alkaloid](#) found in *Sceletium tortuosum* (kanna) and other [species](#) of *Aizoaceae* (Mesembryanthemaceae). Mesembrine inhibits serotonin uptake thus increasing extracellular levels of serotonin and therefore increasing serotonergic neurotransmission. Mesembrine is also an inhibitor of the enzyme phosphodiesterase. Mesembrine is certainly mood-altering and may be an anti-depressant.

[Structure of Mesembrine](#)

Mesomorphic - adapted to conditions that are neither very wet nor especially dry.

Mesophyll - the photosynthetic layer of tissue of a green [plant](#) underneath the [epidermis](#).

Microcarpa - with small [fruits](#).

Micromeris - with small parts or divisions.

Micropyle - a small pore in a [seed](#) that allows water absorption. A minute opening in the wall of

an [ovule](#) through which the [pollen](#) tube enters.

Microsperma - with small [seeds](#).

Microsporangium - Pl. Microsporangia - a structure in spore-bearing plants e.g. Cycads in which the male microspores form, similar to the [pollen](#) sac in seed plants.

Midrib - the main or central rib of a [leaf](#).

Mitosis - the normal process of [cell](#) division when the [diploid](#) or other normal [chromosome](#) number is conserved to produce two daughter cells with identical numbers of chromosomes to the parent cell.

Mitochondria - a functional organelle in the [cell cytoplasm](#), of both [plants](#) and animals, containing highly ordered [membrane](#)-bound arrays of enzymes and proteins involved in respiration and energy metabolism. Mitochondria contain a small circular piece of [DNA](#), which carries genes for a small number of mitochondrial proteins. Mitochondria are inherited almost exclusively from the female parent, and DNA sequences encoding mitochondrial genes are analysed to determine inter-specific relationships and the slow rates of mutation in mitochondrial DNA sequences are used as one form of "molecular clock."

Monocarpic - a [plant](#) that [flowers](#) only once in its life and then dies.

Monocotyledon - a large group of [flowering plants](#) with a single [cotyledon](#) that initially emerges from the [seed](#). The *Agavaceae* and *Liliaceae* are monocotyledons.

Monoculture - growth of a single species in a particular area.

Monoecious - with both male and female reproductive organs on the same [plant](#).

Monomorphic - with a single shape or form.

Monophyletic - of a group of organisms sharing and including a common ancestor, and including all the descendents of that common ancestor, therefore with similar characteristics.

Otherwise known as a [clade](#).

See also: [paraphyletic](#), [polyphyletic](#).

Monotypic - a [genus](#) with a single representative species.

Monstrose - Monstrous - an abnormal uncoordinated form of [vegetative](#) growth, often with random production of differentiated structures, resulting in loss of normal growth habit.

Montane - occurring in mountains.

Mucilage - a water-soluble gelatinous slime, generally containing modified [carbohydrates](#).

Mucro - a short sharp point on the tip of a [flower](#) or [leaf](#). See also: [drip tip](#).

Mucronate - ending with a triangular tip or a sharp point.

Multicellular - of an organism composed of many cells.

Multigeniculata - with many angled [stems](#).

Mycorrhiza - a symbiotic relationship between certain [fungi](#) and the [roots](#) of [plants](#), including orchids and many types of [tree](#). Mycorrhiza may be ectotrophic, where the fungal hyphae invades the host roots or endotrophic where the fungal hyphae are entirely within the root [cells](#). The fungal hyphae can help the roots to absorb essential nutrients and in some [species](#) are essential to the normal growth of the plant.



N

Napiform - turnip shaped (root).

Nastic - of a movement made by a part of a fixed [plant](#) in response to a non-directional or diffuse stimulus. The direction of movement is always related to the nature of the plant part and not to the stimulus.

Natural selection - the driving force behind [evolution](#), whereby organisms best adapted to their environment and most able to withstand environmental pressures are most likely to survive and reproduce, ensuring propagation and survival of their [genes](#) through the gene pool.

Necrosis - sudden discoloration (yellow progressing to brown) of plant tissue, followed by die back of the [epidermis](#), caused by many factors.

Nectar - a sugary secretion produced by [flowers](#) and other [vegetative](#) parts. Nectar attracts pollinators to flowers.

Nectary - a multicellular glandular structure secreting [nectar](#). Found in [flowers](#) and on [vegetative](#) parts in some species.

Nematode - an unsegmented roundworm with elongated rounded body, pointed at both ends. Most *Nematodes* are free-living in soil, fresh and salty water, but some are important parasites of animals and humans. *Nematoda* with over 20,000 species described, is the most common phyla of animals.

Neotype - a specimen selected to serve as the [taxonomic species type](#) when the original type material is missing.

Neri - of a species with a large number of a particular differentiated structure from the Greek *nêrithmos* = countless. e.g. countless [spines](#) = *nerispina*, *nerispinus*.

Neutral - i. applied to [flowers](#) with neither [stamens](#) nor [pistils](#).
ii. applied to soils, liquids etc. which are neither acidic nor basic.

New World - colloquial- the north, central and southern Americas.

Niche - the position that an organism occupies within its environment.

Nitrogen fixing - of [plants](#), often [legumes](#), which are able to extract and fix nitrogen from the air by means of a symbiotic relationship with bacteria (e.g. *Rhizobium species*.) often in root nodules.

Nocturnal - belonging to the night, as of [flowers](#) that open at night.

Node - the place on a [stem](#) where leaves or [branches](#) originate.

Nomenclature - the study of the systematic naming of taxa, using Latin names so that they will be intelligible and uniform in all countries.

Nomen conservandum - nom. cons. - conserved name - the name of a taxon, usually one in which the name is in common usage, which is internationally agreed to be exempt from the usual rules of priority of publication.

Nomen illegitimum - nom. illeg. - a validly published name that is not in accordance with one or more rules, principally those on superfluity and homonymy.

Nomen invalidum - nom. inval. - a name not validly published according to the rules of publication.

Nomen nudum - naked name - a name published without an accompanying description or diagnosis or reference to same.

Nomen rejiciendum - nom. rej. - a name rejected in favour of a conserved name conserved or otherwise ruled as rejected.

Nothogenus - a generic name denoting an intergeneric hybrid produced by crossing plants from two different genera. Usually denoted by an 'x' before the name.

Nucellus - The central part of the ovule enclosing the female [gametophyte](#).

Nucleolus - a small round densely-staining region within the [cell nucleus](#) which contains ribosomal [rRNA](#) subunits and nuclear organisers (multiple copies of genes encoding rRNA).

Nucleus - a large [organelle](#), usually located near the center of the [cell](#) and containing the [DNA](#).

Nuda - naked, without [spines](#), wool etc.

Nudiflorus - naked [flowers](#) without scales, [spines](#), or wool on the ovary and [flower](#) tube.

Nurse plant - a [plant](#), often a [shrub](#), which provides shelter and shade to developing seedlings of other plants.

Nut - a hard-walled [fruit](#) containing a single [seed](#) that does not split spontaneously.

Nutrient - a chemical substance that an organism ingests to enable it to survive e.g. essential minerals.

Nyctinasty - of a movement in response to changing day and night conditions.
See also: [Nastic](#).



O

Ob - a prefix to another structural descriptor of a part, indicating attachment in the opposite or

inverse way to that expected from the rest of the descriptor. Hence *obovate* = *ovate* but attached at the narrow end.

Obconate - conical with the attachment at the apex of the cone.

Oblanceolate - *lanceolate* but attached at the narrow end.

Obligate - compulsory, essential, unable to exist under alternative conditions.

Oblique - in a diagonal position.

Obovate - *ovate* or *ovoid* but attached at the narrow end.

Obsolete - not developed.

Obtuse - with an angle greater than 90 degrees and less than 180 degrees, blunt.

Offset - a *plant* or plants growing from a side-shoot, rhizome or tuber that remains connected to the main plant, often easily removed for propagation.

Omnivore - an animal that eats both *plants* and animals.

Old World - colloquial- Europe, Africa and Asia.

Ontogeny - sequential development of an individual through all its stages.

Opposite - parts of a *plant*, such as leaves, arranged in pairs on opposite sides of the *stem*.

Orbicular - round and flat or spheroidal.

Order - a taxonomic grouping below *Class* and above *Family*. A taxonomic Order contains one or more *Families*.

Organ - a distinct and visibly differentiated part of a *plant* such as a *leaf*.

Organelle - a distinct sub-*cellular* structure, usually with a specific function and compartmentalised within its own *membrane*.

Organic -

i. of a mainly carbon-based molecule or chemical or chemistry.

ii. a style of agriculture where synthetic pesticides and fertilisers are not used.

iii. of food produced by organic farming methods.

iv. a marketing ploy to sell sub-standard fruit with wormholes at an inflated price.

See also: *Inorganic*.

Organism - a complete, living individual member of a species.

Osiris - ancient Egyptian god of vegetation, credited with introducing the skills of agriculture to the Egyptians. He became the god of the dead and the underworld, following his slaying by his brother Set and restoration to life by his wife and sister Isis. Osiris is sometimes depicted with green skin in paintings or in statues made from green stone, reflecting his aspects of agriculture, vegetation, fertility and resurrection. He was recorded as the first to make mankind give up

cannibalism and credited with introducing culture of the vine and fermentation of its [fruit](#) to produce wine. This may be the oldest account of a biochemical process.

The legend of Osiris and Isis dates back to at least 2400 BC, as recounted by the Greek historian Plutarch (AD 46-120). The historian Diodorus Siculus (1st century BC) included Osiris among those who had been men, immortalised by virtue of their sagacity and good works. By this account, the legend of Osiris dates back to between 25,000 and 12,000 years ago.

The story may be derived from the Sumerian goddess of fertility, Ishtar who could grant crops and children to her devotees. Ishtar's son Tammuz rose from the dead each year, after the hot summer months, to make the land green again.

Osmosis - the movement of water through a selectively permeable membrane from a place of low solute concentration to a place of higher solute concentration.

Ovary - the female reproductive part of the [plant](#), below the style, containing the egg [cells](#) ([ovules](#)) that after fertilisation enlarge and become [seeds](#).

Ovate - a flattened structure (e.g. [leaf](#)) having an outline in the shape of an egg, with the [stalk](#) or point of attachment at the large end.

Ovoid - a structure with a circular cross section (i.e. not flattened as in [ovate](#)) having an outline in the shape of an egg, with the [stalk](#) or point of attachment at the large end.

Ovule - the outgrowth in a [seed-plant's ovary](#) that develops into a [seed](#) following fertilisation of the egg [cell](#) within it. The fertilised egg cell forms a group of cells that becomes an embryo consisting of an axis, ([root](#) and [stem](#), or [hypocotyl](#) and [epicotyl](#)) and in *Cactaceae* two [cotyledons](#), with its associated protective and nutritive structures capable of developing into a plant.



P

Pachycaul - of massive construction. [Plants](#) with a thick or swollen stem.

Palea - a scale.

Paleate - clothed with scales.

Paleobotany - the study of [plants](#) that existed in former geological periods, mainly known from their fossils or [pollen](#).

Palm - a [monocotyledon](#) of the family *Palmae* with an unbranched [trunk](#) or [stem](#) crowned with large [pinnate](#) (fan-shaped) [leaves](#). Most species are tropical or sub-tropical and some are economically important.

Palmate - divided with radial lobes like the fingers of a hand.

Panicle - a branched [flower](#) cluster, a [compound raceme](#) with [pedicellate](#) flowers. A loosely-branching pyramid-shaped cluster of flowers.

Papilla - small, rounded protruberance from any [plant](#) surface. Hence: Adj. *papillose* - of or relating to or resembling papilla

Papillate - covered with many tiny projections (papilla).

Papyracantha - with papery [spines](#).

Paraphyletic - of a group of organisms sharing and including a common ancestor, but not including all the descendents of that common ancestor.

See also: [monophyletic](#), [polyphyletic](#).

Parasite - an organism that grows on or within another, drawing its nutrients from it e.g. mistletoe. See also [commensal](#), [symbiosis](#).

Parastichy - reference to the virtual [spirals](#) in [plants](#), joining elements ([tubercle](#), [leaf](#), [scale](#), [florete](#)) to their nearest neighbors. Parastichies usually come in two families winding in opposite directions. Parastichy numbers denoted by a pair (n,m) classify [spiral](#) and [whorl phyllotaxes](#).

Paratype - additional specimens, other the [holotype](#), cited at the same time as the original description.

Parenchyma - living undifferentiated [cellular](#) tissue with thin [cell walls](#), which may differentiate to form other types of cell. Parenchyma cells are the most common [plant](#) cells, make and store food substances and form the pith at the centre of [stems](#) of [dicotyledons](#).

Parietal - borne on or pertaining to the wall or inner surface of a [capsule](#) or other hollow structure. Of [ovules](#) arising from the outer wall of the [ovary](#) and pointing inwards.

Parviflora - Parviflorum - Parviflorus - with small [flowers](#).

Parvifolia - Parvifolium - Parvifolius - with small [leaves](#).

Paucispinus - with few [spines](#).

Pectin - complex carbohydrates derived from poly-galacturonic acid, present in inter-[cellular](#) substances (middle lamella) and [cell walls](#). Pectins may be divided into the three general types: protopectin, pectin and pectic acid.

Pectinate - comb-like- often used to refer to [species](#) in which the [spines](#) (or other structures) are spread out like the teeth of a comb.

Pedicel - the short [stalk](#) connecting a [flower](#) to the main [stem](#) of a [plant](#) or [branches](#) of its [inflorescence](#). Hence: Adj. pedicellate - with stalks.

Peduncle - a stem supporting an inflorescence, or an infructescence.

Peltate - shield-shaped; of a [leaf](#) with with the leaf stalk ([petiole](#)) attached to the lower surface within the leaf margin, often near the centre.

Pendent - hanging down from a support.

Pendulous - drooping or hanging down.

Penicillate - like a tuft of [hairs](#).

Pentagonous - with five angles.

Pepo - (Latin: = pumpkin) a **berry** with a firm **rind**, fleshy **pulp**, many **seeds** and a single **locule**, typified by **fruits** of the *Cucurbitaceae*.

Perennial - growing for more than two years. *Cactaceae* are generally regarded as perennials.

Perfect - of an organism capable of sexual reproduction. Of a flower with both male and female flower parts.

Perianth - the combined structure comprising the **calyx** (**sepals**) and **corolla** (**petals**). In *Cactaceae*, the sepals and petals form an intergrading series known variously as perianth segments, **tepals**, sepaloids and petaloids.

Perianth segment (**tepal**) - the **leaf** like and sterile parts of a flower, especially used if these parts are not distinguishable into **calyx** and **corolla**.

Pericarp - (Greek: *peri* = around + *karpos* = fruit) the ripened and modified walls of a matured **plant** ovary, surrounding the seeds, including the skin and flesh.

Perisperm - the nutritional tissue contained in a **seed**, especially that portion which is formed outside of the embryo sac from the **nucellus**.

Persistent - remaining attached instead of falling away.

Pesticide - a chemical or other substance used to kill pests. Depending on the target species pesticides may be referred to as insecticides (insects), herbicides (plants), fungicides (fungi) and nematocides (**nematodes**). Pesticides may act on contact or require ingestion.

Petal - one of the segments of the inner **perianth** segments or **corolla**. In the *Cactaceae* these are actually petaloid parts of the **perianth** and not true petals. Petals are often brightly coloured and interior to the **sepals**.

Petiole - the **leaf stalk**.

Phaeacantha - with dusky **spines**.

Phenotype - the physical characteristics and appearance of an organism.

Phloem - the main food-conducting tissue of **vascular plants**, comprising sieve elements, parenchyma **cells**, fibers and sclereids.

Photosynthesis - the production of sugars from water and carbon dioxide using energy trapped from sunlight with the aid of **chlorophyll**.

Photonasty - of a movement in response to variation in light intensity.
See also: **Nastic**.

Phototaxis - movement of a whole organism or freely motile part in response to variation in light intensity and direction.
See also: **Tactic**.

Phototropism - bending, growth or movement of a part towards or away from light.

See also: [Tropism](#).

Phyllopodia - a hardened, residual basal remnant of a sclerified [leaf](#).

Phyllopodium - the whole main axis of a [leaf](#), excluding its branches.

Phylogeny - the evolutionary history of a [species](#) or [plant](#) group.

Phylum - a major taxonomic grouping and primary division of a [Kingdom](#), as in Kingdom *Plantae*, ranking above [Class](#) in size. In botany, Phylum is usually replaced by [Division](#).

Phyllotaxis, Phyllotaxy - the study of how repeated structures such as leaves are arranged around a [stem](#), tubercles around a [cactus](#) body. Reference to specific arrangements (e.g. (3,5) spiral phyllotaxis). Types of phyllotaxes are spiral, multijugate, [decussate](#), [distichous](#) and [whorled](#) of which the last two are special cases of the first two. (Gr. phyllo = [leaf](#) + taxis = arrangement)

Phytolith - a microscopic mineral particle, formed within a living [plant tissue](#), consisting of silica (opal phytolith) or calcium oxalate and providing a durable record for archaeology and paleontology.

Phytomelanin - a papery black or blue layer or crust over the [seed](#) of [plants](#) in the order *Asparagales*, including *Agavaceae*, *Aloaceae*, *Amaryllidaceae* and *Hyacinthaceae*, although not present in seed of the *Orchidaceae*, and present as a mechanically hard brown or black layer covering seeds of other unrelated [families](#) e.g. *Compositae*. Nevertheless, the presence of phytomelanin is considered an important characteristic of the *Asparagales*. The chemical homology of phytomelanin in different plant families is not clear and its exact chemical composition is still controversial. The pigment is chemically inert and resistant to acids and bases and organic solvents. It's presence in seeds of *Compositae* may reduce damage from insect larvae.

Pila -

i. a pillar or pillar-like structure.

ii. a genus of African and Asian snails of the [family](#) *Piladae*, including around 30 species.

Pinching - removing the terminal [bud](#), e.g. to encourage side-shoots or to prevent [flower](#) formation.

Pinnate - feather-formed. Said of a [compound leaf](#) with the [leaflets](#) along both sides of the leaf [stalk](#).

Piperine - an [alkaloid](#) responsible for the pungent taste of black pepper, the ground fruits of *Piper nigrum*.

[Structure of Piperine](#)

Pistil - female organ of [flower](#) including stigma, style and ovary.

Pit -

i. a hard inner woody layer of the [pericarp](#) of some fruits (e.g. plum, cherry, olive) that contains and protects the [seed](#).

ii. a small pockmark or depression in any structure. Hence pitted - with multiple pits.

iii. prefixed to a species name, refers to pitch or resin (e.g. *Pittosporum* = resinous [seed](#)).

Pitahaya - edible [fruit](#) from several [species](#) of *Cactaceae* (e.g. *Hylocereus polyrhizus*, *H. undulatus*, *Stenocereus queretaroensis*, *Acanthocereus* sp.) is commonly called *pitahaya*, *pitajaya*, *pitaya*. The [fruit](#) of all cacti is safe to eat, avoiding [spines](#), glochids and tiny [hairs](#) present on fruit of some species, but only a few species have any culinary merit. Fruit of *Acanthocereus* species is said to have diuretic properties. Cactus fruit is farmed and exported from several countries including Colombia, Honduras, Palestine, Mexico and Nicaragua and is sometimes available in European and USA supermarkets.

Placentation - arrangement and attachment of [ovules](#) in the [ovary](#).

Plant - a living organism, in the [Kingdom Plantae](#), with [cellulose cell walls](#) and lacking a nervous system or powers of voluntary motion. Self-supporting plants use [chlorophyll](#) to capture energy from sunlight, using it to synthesise food from carbon-dioxide, water and other inorganic substances. Dependent plants (e.g. [fungi](#), [parasites](#), [saprophytes](#)) have no chlorophyll and use pre-existing carbon compounds as a food source. A complete plant may have [roots](#), [stems](#) and [leaves](#) but in some cases consists of only a single leafy tissue, a series of linked [cells](#) or even a single cell. Plants are divided into [flowering](#) plants ([angiosperms](#)) reproducing through [seeds](#) and flowerless plants ([gymnosperms](#)) which reproduce by single celled [spores](#).

Plasmodesmata - [cytoplasmic](#) strands passing between the [protoplasts](#) of adjacent [plant cells](#) through pores in the cell [walls](#).

Plastid - a discrete structure, such as a [chloroplast](#), within a cell often containing water-insoluble coloured pigments such as [chlorophyll](#) and associated yellow, orange or red pigments.

Plumose - feather-like.

Poikilohydric - of a plant with no mechanism to prevent desiccation.

Poikilohydry - the ability of a plant to tolerate low tissue water content without damage and recover from it when wetter conditions prevail.

Pollen - the dust-like fertilising male cells of gymnosperms and angiosperms. The microscopic architecture of pollen grains is characteristic of the [plant](#) species.

Polyacantha - with many [spines](#).

Polyancistrus - with many hooks.

Polycarpic - a [plant](#) that [flowers](#) more than once in its lifetime.

Polycephalus - with many heads.

Polypetalous - of a [corolla](#) with many separate [petals](#).

Polyphyletic - of a group of organisms not including the most recent common ancestor, often because this common ancestor is not characteristic of the group or because the group originated from more than one evolutionary line. Polyphyletic taxa are considered "unnatural" and tend to become targets for revision by taxonomists.

See also: [monophyletic](#), [paraphyletic](#).

Polyploid - with more than two sets ([diploid](#)) of the basic chromosome number.

Polysaccharide - a long branched or unbranched chain of sugars linked together by glycosidic bonds. Polysaccharides are frequently molecules of great size, with molecular weights up to several million, and may serve architectural (e.g. [cellulose](#)) or food storage (e.g. [starch](#)) functions.

Pome - a fleshy [fruit](#) (e.g. apple, pear) having [seed](#) chambers formed from an [inferior ovary](#) surrounded by an outer fleshy part made from an enlarged [hypanthium](#).

Porrect - extended horizontally, stretched out, pointing outward and forward.

Posterior - towards the back or towards the main axis.

Procumbent - lying on the ground but not rooting.

Proliferous - bearing [vegetative](#) offsets. Used to describe [flowers](#) or [fruits](#) that produce further flowers.

Prophyll - a rudimentary [leaf](#) at the base of a leafy shoot.

Prothallus - the growth, typical of [pteridophytes](#), following a germination of a [spore](#) which for the purpose of sexual reproduction produces the [antheridia](#) and [archegonia](#).

Prostrate - lying flat upon the ground.

Protein - a large biological macromolecule made from linear chains of amino acids (polypeptides) linked together by amide bonds. Proteins can have structural or functional (e.g. enzymes) roles in cells, and large proteins may be formed from multiple polypeptide subunits. The structure of each protein or polypeptide subunit is specified by a single [gene](#).

Protoplast - the plasma membrane, [nucleus](#) and [cytoplasm](#) of the cell. A [plant](#) cell from which the rigid [cell wall](#) has been removed.

Proximal - towards the base of something near to where it is attached.

Pruinose - having a frosted appearance with a white powdery coating.

Pseudocephalium - development of wool and bristles on a mature [flowering stem](#) which continues growth. See also [cephalium](#).

Pteridophyte - the general name for the ferns and related genera.

Pubescent - covered with short, soft downy [hairs](#) (like a peach).

Pubispina - with downy [spines](#).

See also: [arachnoid](#), [barbate](#), [canescence](#), [capillaceus](#), [capillatus](#), [ciliate](#), [cephalium](#), [coma](#), [felt](#), [glochids](#), [hirsute](#), [lanate](#), [lasiacantha](#), [penicillate](#), [pubescent](#), [scabrous](#), [villous](#), [woolly](#)

Pulchellus - small and beautiful.

Pulp - the juicy flesh filling the cavity of a [fruit](#).

Pulque - a traditional alcoholic drink made in Mexico from the fermented sap of [Maguey](#) (various [Agave](#) species). Unlike beer, the fermentable carbohydrate is fructose, not [starch](#).

Pulverulent - with a dusty coating.

Punctulate - covered with very fine points or dots e.g. the surface of a [seed](#).

Pungent - terminating in a rigid sharp point. With an acrid, biting or sharp smell or taste.

Pyrethrum - a natural insecticide produced by Chrysanthemums, especially *Chrysanthemum cinerariifolium* and *C. coccineum*. The dried, powdered flowers of Chrysanthemums have been used as natural insecticides against lice for over 2000 years. Synthetic analogues of Pyrethrin are produced as insecticides.

[Structure of Pyrethrin](#)

Pyriform - pear-shaped .

Pyrrrolizidine - an aromatic ring system found in the toxic pyrrolizidine [alkaloids](#) typical of the Genus *Senecio*.



Q

Quadrangularis - with four angles.

Quadrangulispinus - with four angled [spines](#).

Quadricostatus - with four [ribs](#).

Quadrispinus - with four [spines](#).

Quinine - an [alkaloid](#), found in the [bark](#) of the Cinchona [tree](#), is used to treat malaria, a tropical parasitic disease carried by mosquitoes. Quinine is an essential bitter ingredient of certain drinks e.g. Indian tonic water, where it can be recognised by its blue fluorescence under ultra-violet (black) light illumination.

[Structure of Quinine](#)



R

Raceme - (Latin: *racemus* = bunch of grapes) an elongated cluster of [pedicellate flowers](#) on an unbranched [inflorescence](#), with the basal flowers opening first.

Radial - peripheral or positioned around the edges. In the *Cactaceae*, a [spine](#) positioned on the periphery of an areole.

Radial symmetry- of [flowers](#) which can be cut into equal halves along many axes passing through the flower centre.

Radiating - positioned outwards.

Radicle - an embryonic root.

Rainforest - a complex very rich community in tropical habitats with very high rainfall, dominated by [trees](#) generally supporting many [epiphytes](#) and [lianas](#).

Rainstick - a musical percussive instrument made from a hollowed-out [stem](#) of a woody cactus, chiefly *Echinopsis chiloensis* and *Eulychnia acida* from Chile, filled with small pebbles or sand and sealed at both ends. Spines are inserted to make baffles within the hollow [stem](#). Large numbers of rainsticks are exported from Chile to the United States and Europe as curiosities.

Raphide - (Raphis) a needle-shaped crystal found in some [plant cells](#), usually a crystal of calcium oxalate as a metabolic byproduct. The irritatingly sharp crystals discourage predation by [herbivores](#).

Ray [flower](#) - one of the outer irregular florets, typically with a single tongue-shaped corolla, on flower heads of some [species](#) of *Compositae* (Sunflower [family](#)).

John Ray (1628 - 1705) - an eminent English naturalist who worked on classification of organisms and was the first to divide flowering plants into [monocotyledons](#) and [dicotyledons](#). He also recognised fossils as the remains of once living organisms.

Receptacle - enlarged apex of a flower [stalk](#) bearing the parts of a flower or the florets of a composite flower. In ferns, a main [stem](#) on which sporangia arise.

Reclinate - curved backwards.

Reclining - sprawling on the ground or leaning against something.

Recurved - bent, curved or curled downwards or backwards.

Rectispinus - with straight [spines](#).

Reflexed - abruptly curved backwards.

Regular - made from evenly, symmetrically arranged parts.

Regular [flower](#)- a radially symmetrical flower in which similar parts are equal in size, form or extent of fusion.

Reniform - an oval with the ends curved around in the same direction like a kidney.

Residual - a property of a substance, such as a pesticide, that allows it to remain in an area for a long time.

Respiration - a process of releasing energy by oxidising molecules such as glucose to carbon dioxide. Respiration produces useful reactive molecules, such as ATP (adenosine triphosphate) which activates many cellular processes by transfer of its terminal phosphate group.

Reticulate - a net-like or criss-cross pattern, often of [leaf](#) veins.

Retorse - bent or curved backward or downward.

Retuse - a rounded termination with a small notch forming two small lobes.

Rhizoid - a filamentous root-like structure on a [pteridophyte](#) (fern) [prothallus](#).

Rhizome - an underground [stem](#) from which roots, aerial stems or leaves can arise directly.
Hence: Adj. rhizomatous - producing or possessing rhizomes.

Rhodianin - a flavanol conjugated with the sugar rhamnose found in extracts of the genus [Rhodiola](#).

[Structure of Rhodianin](#)

Rhomboid - diamond-shaped.

Rib - a [leaf](#) vein. A ridge of [plant](#)-tissue thicker than its surroundings. A raised surface running vertically, sometimes spiraling, and in the [Cactaceae](#) bearing a row of [areoles](#) along its summit. Morphologically, a rib is composed of a continuous line of fused [tubercles](#), which in some cases may be discerned as bulges in the structure.

Ricin - an extremely toxic [protein](#) found in the [seed](#) of the castor oil [plant](#) *Ricinus communis*, a member of the [Euphorbiaceae](#), grown commercially for the oil content of the seed and sometimes grown as an ornamental garden annual. Less than a milligram of ricin injected into the blood stream can be fatal.

Rind - an external covering or coat such as the [bark](#) of a [tree](#) over the [cambium](#) layer, the tough outer skin of a [fruit](#).

Riparian - of [plants](#) growing along the side or on the bottom of a watercourse, or in other aquatic areas.

RNA - ribonucleic acid- an extremely long single-stranded linear polymer, made (transcribed) as a secondary copy of the [gene](#) sequences in [DNA](#) and also found as the primary genetic material in some [viruses](#) e.g. tobacco mosaic virus.

RNA is found in cells as three basic types:

- **mRNA** - copies of gene sequences to be translated into [proteins](#)
- **tRNA** - transfer RNA specifying and collecting one of 20 individual amino acids for insertion into [proteins](#)
- **rRNA** - ribosomal RNA associated with [proteins](#) in ribosomes, the sub-cellular mechanisms responsible for building proteins from the mRNA sequence

Rheotropism - bending, growth or movement of a part under the influence of a water current.
See also: [Tropism](#).

Root - a structure usually providing a [plant](#) with anchorage and a means of absorbing water and nutrients from the substrate. Many [Cactaceae](#) have a widespread shallow fibrous root system, in addition to any [taproot](#) or [tuber](#). This is an adaptation for scavenging water before it evaporates.
See also [aerial root](#).

Root [hair](#)- a trichome on the root [epidermis](#) made from an extension of an epidermal [cell](#) which assists with absorption of nutrients.

Rosette - a tight cluster of leaves that are arranged around a central apex and grow outward to form a radially symmetrical pattern.

Rostrate - with a beak-like projection.

Rosulate - with leaves in a [rosette](#).

Rotate - radiating horizontally like the spokes of a wheel.

Rubber - (caoutchouc) an [organic](#) (polyterpene) component of the [latex](#) produced within the [bark](#) of large [trees](#) in the [family](#) *Euphorbiaceae* (spurges) notably the Pará rubber tree (*Hevea brasiliensis*) native to the Amazonian rain forest in South America. [Seeds](#) from the rubber tree were sent in 1876 to Kew gardens, London, England by Henry Wickham, a local planter. Following germination of the seeds in the tropical herbarium at Kew, seedlings were exported to Ceylon (Sri Lanka) and a year later sent from Ceylon to Singapore where the method of tapping the tree for latex was developed. This avoided felling the tree to obtain latex. The rubber tree is grown commercially in Malaysia, Thailand, Indonesia, and Sri Lanka but only to a very limited extent in South America.

The latex from the rubber tree is an aqueous emulsion, also containing various [proteins](#), and is generally coagulated by heat to produce natural rubber. Most of this is vulcanised by heating with sulphur to cross-link the polymer chains and harden the product.

Rudimentary - developed only to a primitive or early stage.

Rufous - with a reddish colouring.

Rugose - wrinkled.



S

Sagittate - shaped like an arrow head with two lobes pointing backwards.

Saline - salty.

Samara - a winged [fruit](#) containing a single [seed](#). (Latin: *samara* = elm seed).

Saprophyte - an organism deriving its nourishment from decaying or non-living [organic](#) material.

Saprophytic - of a free-living organism obtaining all nutrients from non-living [organic](#) sources.

Sarcody - a hyperplastic symptom in which swellings occur above and below portions of organs that are tightly encircled, as a [stem](#) might be 'choked' by a tight tie or binding or by a twining vine.

Satellite DNA - short sequences in eucaryotic DNA that are present in large numbers of repetitive copies, differ in base composition and therefore density from most of the DNA and are generally not transcribed. Often associated with the centromere.

Satellite virus - of a small virus associated with tobacco necrosis virus (TNV), which is dependent upon the TNV genome for its own replication. Of a defective virus associated functionally with another virus which it depends on for replication.

Savanna - a [plant](#) community dominated by grasses with occasional scattered [trees](#).

Scab - a hyperplastic symptom of disease characterised by rough, crusty lesions formed by excessive cork production. A disease in which such lesions form.

Scabrous - of a [leaf](#), roughened by [tubercles](#), [hairs](#) or other structures on its surface.

Scale - a small [leaf](#) like structure. A narrow, triangular or [spine](#)-like lower perianth segment often found on the [ovary](#) or [flower](#) tube surface. Also see [scale insect](#).

Scale insect - a small flat insect pest, with a [waxy](#) dorsal shield, that adheres to the [plant epidermis](#) and feeds from the [plant](#) sap.

Scandent - climbing.

Scape - a long [flower stalk](#) arising directly from a root. Adj. *scapose*- borne on scapes.

Scarification - a mechanical abrasive [seed](#) treatment which helps to break down a hard or impervious [seed](#) coat as an aid to germination.

Scarious - having a dry membranous appearance.

Scion - the top part of a graft.

Sclerophyll - (Greek = hard-leaved) - a woody [plant](#) with small, leathery, evergreen leaves that retain water and typically found in hot, dry climates such as Australia.

Scorch - dry brown discolouration giving a 'burnt' appearance to [leaf](#) margins as a result of infection or exposure to unfavourable environmental conditions.

Scoria - crushed volcanic rock.

Scrotiform - shaped like a hollow pouch or sac.

Scrub - a [plant](#) community dominated by low [shrubs](#).

Seed - a sexually-produced embryo, consisting of an axis ([root](#) and [stem](#), or [hypocotyl](#) and [epicotyl](#)) and in *Cactaceae* two [cotyledons](#), with its associated protective and nutritive structures capable of developing into a [plant](#).

Seismonastic - a movement response to a shock stimulus. Of the movement of the stamens towards the [pistil](#) when touched.

Senesce - to age naturally.

Senescence - natural aging of a part.

Senescent - of an aging part.

Sepal - one of the separate [perianth](#) leaves of the [calyx](#).

Sericeous - silky.

Serrated - bearing straight-sided teeth. Hence Serrate - with edges like a saw blade.

Sessile - stalkless, immobile e.g. of a flower with no stalk but attached directly to the stem.

Setaceous - bearing bristles.

Setose - terminating gradually in a fine sharp bristle.

Sexual - of reproduction through the merging of male and female gametes to form a **zygote** which develops into a new **plant**.

Shrub - a horticultural term for a low **bushy plant** with multiple **stems** normally branching from the base, rather than having a single stem branching higher up as in the case of a **tree**.

Simple - of a **leaf** with an undivided **blade**, although it may be **lobed**. Of a **fruit** developed from a single **ovary**.

Sinuate - wavy-edged.

Soft Water - contains relatively low concentrations of salts (usually calcium and magnesium) that interfere with the formation of a lather with soap. Soft water from a treatment **plant** may contain sodium ions conferring a salty taste and making it unsuitable for irrigation.

Sp. - abbreviation for species, used as the second part of a **binomial_name** when the **genus** is known, but not the species.

Spadix - a **spicate inflorescence** with congested, often tiny, **flowers** and a stout, often fleshy or **succulent** axis, often more or less surrounded by a **spathe**. Characteristic morphology of the **family Araceae**.

Spathe - a large, often showy, solitary **bract** or pair of bracts ensheathing a **spadix** or other **inflorescence** on the same axis.

Spathulate - spoon-shaped.

Spatulate - long and thin, broadening towards the tip, like a spatula.

Specialist natural enemy - a predator which attacks only one (or a few) species. Specialist natural enemies are sometimes used as biological controls.

Speciation - a process of differentiation of a single **species** into one or more distinct species. This can occur through geographic isolation, where the species no longer interbreed and their characteristics slowly change under different environmental pressures.

Species - a population of individuals recognisable by morphological **characteristics** and unified genetic relationship, sometimes capable of subdivision into subspecies or varieties which are sufficiently closely related for interbreeding to produce offspring classified within the same species and with the same morphological characteristics.

Specific - pertaining to a species.

Sphagnum - any moss of the **genus Sphagnum**, sometimes used as a growing medium for e.g. epiphytes.

Spheroid - spherical with slightly flattened ends.

Spicule - a very small, fine [spine](#) or in *Opuntioideae* a glochid.

Spike - simple [inflorescence](#), an elongated multiple cluster of [sessile](#) florets directly attached to an unbranched [flowering stem](#). Hence: Adj. spicate.

Spination - the characteristics and distribution of [spines](#), which may in some cases be distinguishing features.

Spine - a sharp outgrowth from the [epidermis](#) which may be stout and [woody](#) or fine and [hair-like](#). In *Cactaceae*, always arising multiply from an [areole](#) and originating as a modified [leaf](#). Spines are classified as [central](#) spines located centrally on the areole and [radial](#) spines around the margins of the areole. Spines protect the [plant](#) from some predators, albeit inefficiently. In some species, spines act as a [drip tip](#) where atmospheric moisture from dews, mists and rain precipitates on the spines and drips off the tip onto the soil near the base of the plant for uptake by the shallow root system.

Compare with [thorns](#).

Splitter - colloquial - one who takes a narrow view of a [genus](#), dividing up variant forms into individual [species](#).

Spiral - corkscrew-shaped. Of leaves or other parts arranged around a stem or other structure with the spirals in Fibonacci number ratios.

Spore - a single, [vegetative](#), reproductive [cell](#) formed by lower [plants](#) ([cryptogams](#)), that does not contain an embryo.

Sporopollenin - a [polysaccharide](#) biopolymer, made from cross-linked phenolics and hydrocarbons, forming a large proportion of the outer wall of [pollen](#) grains. Sporopollenin is highly resistant to acids, bases and decay processes so identifiable [pollen](#) grains persist in ancient deposits as a fossil record of [plants](#) flowering in that era.

Spreading - growing outwardly by means of new shoots or advancing outwards by means of rooting from reclining [stems](#). In *Cactaceae*, an array of radial [spines](#) projecting obliquely outwards around an areole, but not lying flat against the surface of the [plant](#).

Spur - a usually slender hollow projection formed by the fused bases of the lower petals, often containing nectar, in some [flowers](#) or a short [fruit](#)-bearing [stalk](#).

Stalk -

- i. a slender or elongated fleshy structure that supports a [plant](#) or plant part such as a [leaf](#) or [flower](#) or a [fungus](#).
- ii. waste plant material consisting of stem, seed pod etc. separated from harvested seeds.

Stamen - [pollen](#)-bearing male sexual organ of a [flower](#), consisting of anther and filament.

Staminate - of a male [flower](#) possessing stamens but not a [pistil](#).

Staminode - a sterile [stamen](#).

Starch - an insoluble high molecular weight (typically several million kDa) [polysaccharide](#) formed from beta-D-glucose units linked together with alpha-1,4' linkages (compare with [cellulose](#)). Amylose starches are long unbranched molecules while amylopectins are branched polysaccharides with alpha-1,6' linkages at the branch point. Starches can be broken down easily into glucose, as required, by amylase enzymes in the tissues and are the principal food storage substance of [plants](#). Starch can be recognised by forming a characteristic blue colour with iodine.

Stellate - star-shaped.

Stem - the main axis of a [plant](#) which may carry other parts.

Sterile - incapable of engaging in the process of sexual reproduction.

Stigma - receptive surface or structure for [pollen](#) at apex of style or [pistil](#). One style may bear multiple stigmas, in *Cactaceae* usually 3-20.

Stipe - a short supporting [stalk](#).

Stipitate - having, supported or elevated on a [stipe](#).

Stipulate - of a part furnished with [stipules](#). Of a [stem](#) or [leaf stalk](#) ([petiole](#)) with a pair of growths resembling leaf stipules at the base.

Stipule - a small leafy growth, often found in pairs, at the base of a [leaf](#) or [stalk](#).

Stolon - a prostrate basal branch above or below the ground which can root and produce new [plants](#) at its tip.

Stoma - (Pl. *stomata*) - a very small opening or pore through the [plant's epidermis](#), through which respiration and transpiration occurs, surrounded by two [guard cells](#). The stoma is usually capable of active opening and closing through changes in shape of the guard cells. Stomata are found on the plant body of cacti and on any leaves.

Stone - the hard woody inner layer of the [pericarp](#) of [fruits](#) known as [drupes](#) (e.g. cherries, peaches, plums) within which is the [seed](#).

Stratification - a process of exposing sown [seeds](#) to low, near freezing temperatures to imitate natural over-wintering as an aid to germination. During the process, chemical inhibitors of germination are broken down.

Strophiole - (syn. [Caruncle](#) -) of a band or twisted band; a crestlike, corky excrescence about the [hilum](#) of certain [seeds](#), derived from the [funicle](#).

Strychnine - a bitter [alkaloid](#) poison found in the [seeds](#) of the asian [tree](#) *Strychnos nux-vomica* native to India, Sri Lanka and Australia. Strychnine has been used as a poison for several hundred years and causes characteristic convulsions.

Striate - a surface marked with longitudinal (lengthwise) lines, in some cases exhibiting slight ridges or furrows.

Style - structure, usually slender connecting [ovary](#) and [stigma](#).

Sub - a prefix to a descriptor meaning "almost".

Sub-class - a subdivision of a [class](#).

Subgenus - a subdivision of a [genus](#) into morphologically recognisable groupings of [species](#).

Subspecies - a subdivision of a [species](#), recognisable by morphological characteristics, but not isolated by genetic barriers from other members of the species. Sometimes designated as a *variety*.

Subulate - slender or tapering and flattened into a narrow ellipse in cross-section, awl-shaped.

Succulent - juicy (Latin: *succus* = juice,sap), fleshy [plants](#) that store water in specially adapted thickened or swollen organs such as [leaves](#), [stems](#) or [roots](#).

Suckers - shoots or small [plants](#) arising from the base of a larger plant.

Sulco - of a [plant](#) or part with a groove or furrow (Latin: *sulcus* = furrow or groove).

Superior - above other parts, higher in rank or position.

Sustainable use - the careful exploitation of natural resources without destroying them.

Symbiosis - (Greek: = living together) - a balanced partnership in which two dissimilar organisms live together for their mutual benefit e.g. the [algae](#) and [fungae](#) jointly forming [lichens](#). See also [commensal](#) and [parasite](#).

Sympetalous - ([gamopetalous](#)), of a [flower](#) with a [corolla](#) composed of partially or wholly [fused petals](#) forming a tube or funnel.

Synonym - an invalid name according to the International Code for Botanical Nomenclature.



T

Tactic - of a movement made by a whole organism, or by a freely motile part such as a gamete, in response to a directional stimulus which has a direct bearing on the direction of the elicited response.

See also: [Phototaxis](#)

Tannin - a heterogeneous group of astringent phenolic substances, widely distributed in [plants](#), and commercially used in tanning, dyeing and preparation of ink.

Taproot - a primary [root](#) growing straight down from a [plant](#), and larger or longer than the branching fibrous roots. Often a thick storage organ as in a carrot.

Tardiflora (-um) - late [flowering](#).

Tardifolia (-um) - late into [leaf](#).

Taxon - a formally described category of individuals, distinct by some visible characteristics.

Taxonomy - the system and practice of classification.

Tectora (-um) - of roofs.

Teeth - sharp, pointed triangular structures arising on [leaf](#) margins.

Temperate - a climatic zone between boreal and tropical. Regions between the tropic of Cancer and the Artic Circle or the tropic of Capricorn and the Antarctic Circle.

Tender - of a [plant](#) that needs a minimum temperature of 60°F, although occasional brief periods of lower temperatures may be tolerated.

Tendrils - a slender [leafless](#) side-shoot, often coiling around other objects, produced by many climbing [plants](#) as an aid to climbing and support.

Tenui - slender, thin.

Tepal - any of the modified leaves making up a [perianth](#).

Terminal - borne at the end of a [stem](#), [branch](#) or other structure e.g. terminal spine located at the end of a [leaf](#).

Terrestrial - growing in or on the ground.

Tessellate - a surface patterned like a mosaic or pavement. Hence tessellata.

Testa - the outer protective [seed](#)-coat.

Testicular - in the form of two oblong bodies .

Tetra - four, as a prefix.

Tetraploid - with twice the normal complement of chromosomes.

Thermotropism - bending, growth or movement of a part under the influence of a heat source. See also: [Tropism](#).

Thallus - a multicellular plant body, usually flat and not organized into roots, stems, leaves or vascular system.

Thigmotropism - or- Haptotropism - a growth response to a touch stimulus. See also: [Tropism](#).

Thorn - a sharp [woody](#) outgrowth from the [epidermis](#) which unlike the [spines](#) of *Cactaceae* contains [vascular](#) tissue and arises from the underlying tissues ([phylogenetically](#) as a modified [stem](#)). Because of this, breaking a [thorn](#) off the [plant](#) damages the surrounding tissue. Compare with [spines](#).

Throat - the visible portion of a [flower](#) between the limb and [tube](#).

Thyrse - a dense cylindrical or [ovoid inflorescence](#), a compact panicle; branched, the main axis

[indeterminate](#) and the lateral [branches determinate](#) (i.e. with a terminal [flower](#)) or as a [cyme](#).

Tissue - any part of an organism consisting of aggregated [cells](#) with a similar structure and function.

Tomentum - a layer of matted woolly threads on the surface of a plant. Often the hairs are white, giving the surface a silvery appearance. Latin="cushion stuffing"

Tomentose - of a surface covered with tomentum.

Tomentous - of a surface covered with tomentum.

Tomentosum - epithet of a plant covered with tomentum.

Tortuous - twisted.

Tracheid - a basic primitive unit of the [xylem](#) (fluid-conducting tissue), consisting of a single elongated [cell](#) with pointed ends and a thick, pitted secondary cell [wall](#) composed of [cellulose](#) thickened with [lignin](#). The mature tracheid is dead and empty of [cytoplasm](#). Tracheids are found in all vascular [plants](#) and are the only conducting elements in [gymnosperms](#) and ferns.

Tracheary - of conducting tissues containing [tracheids](#) and [vessels](#).

Trans-Pecos - of territory in Texas west of the Pecos River.

Transpiration - loss of water vapour through the [plant's stomata](#). [C4-metabolic](#) adaptations in the [Cactaceae](#) and other [succulents](#) allow transpiration to be minimised.

Transverse - across or at right angles to the vertical.

Trap - a structure designed to catch and detain animal prey.

Tree - a [plant](#) with a single distinct [trunk](#) between the ground and first [branch](#).

Traumatropism - bending, growth or movement of a part as a response to wounding.
See also: [Tropism](#).

Trichome - a [hair-like](#) structure growing at one end from the [plant's epidermis](#). Trichomes have numerous forms including branched or unbranched hairs, scales and glands.

Tridentate - forked into three points.

Trifoliate - a [compound leaf](#) with three [leaflets](#).

Trigger [hair](#) - a specialized structure found in the traps of certain carnivorous [plants](#) which causes the trap to activate in response to stimulation.

Trigonus - with a three-cornered, triangular cross section.

Tropism - Tropic - of a movement by a fixed part of a fixed [plant](#) towards or away from a stimulus such as gravity, heat or light, the direction of movement being determined by the direction from which the stimulus originates. A tropism is caused by a positive or negative growth response on the side of the organ nearest to the stimulus relative to the side furthest from the stimulus, and the whole organ then bends away or towards the stimulus respectively. See

also: [Chemotropism](#), [Galvanotropism](#), [Geotropism](#), [Hydrotropism](#), [Phototropism](#), [Rheotropism](#), [Thermotropism](#), [Thigmotropism](#). [Traumotropism](#),

Truncate - ending suddenly as if cut cleanly off.

Trunk - the main woody stem of a [tree](#) supported and directly attached at the lower end to the roots and at the upper end supporting the [branches](#).

Tube - a narrow [flower](#) structure formed by fusion of the [tepals](#).

Tuber - a thick, fleshy underground modified root or [stem](#) section used for storage of food or water, as in a potato.

Tubercle - small, rounded prominence or knob-like protusion from the surface. In *Cactaceae* a roughly pyrimidal protrusion from the [stem](#) surface, with an [areole](#) at or near its summit. Hence: Adj. *tuberculate*.

Tuberculate - having tubercles.

Tuberous root - a generally undistended [fibrous root](#) system with thickened fleshy sections scattered along its length. Not a [taproot](#) or [caudex](#).

Tubular - in the form of a hollow cylinder.

Turbinate - shaped like an inverted cone or top.

Turgid - swollen by some internal force, usually by fluid uptake.

Turgor pressure - outward force exerted on a [cell wall](#) by water taken up into the cell by [osmosis](#).

See also: [wall pressure](#)

Type - the permanently preserved specimen or specimens on which the [species](#) or sub-species description is based.

Type locality - the place where the type specimen was collected.



U

Umbel - a flat-topped or rounded [inflorescence](#) in the shape of an umbrella with individual [pedicels](#) arising close together.

Umbilicus - a scar or depression on the summit of a [fruit](#) after the [floral](#) parts are shed.

Uncinate- uncate - terminated by a sharply curved hook. Hence uncinatus - with hooked spines.

Undulate - wavy with alternately concave and convex regions. Hence undatus, undulatus - with wavy margins, undulated.

Under glass - grown in the greenhouse or, in the case of a cutting, with a jar or cloche placed over it.

Unequal - asymmetrical.

Ungui - claw-like. Hence unguispinus - with claw-like spines.

Uni - one, singular, as a prefix.

Uniseriate - (Latin: *uniserialis*) arranged in a single row, such as a single row of [seeds](#) in a pea pod. Having one line or series.

Unitegmic - with a single covering over a part e.g. [ovule](#).



V

Vagans - wandering.

Valida - strong, healthy, well developed.

Valve - a segment into which a dry [fruit](#) dehisces.

Variegated - with patches or stripes of different colours, often yellow or reddish. Hence variegata - of a [plant](#) exhibiting variegation.

Variety - a naturally occurring subdivision of a [species](#) representing individuals with distinct but minor variations in their [characteristics](#). The taxonomic rank between subspecies and form.

Vascular - of tissues containing [vessels](#) for conveying fluids and minerals.

Vascular bundle - a compact group of conducting bundles composed of [xylem](#) and [phloem](#) and surrounding tissues, occurring in [stem](#), [leaf](#) and [flower](#). In *Cactaceae* a clear ring of vascular tissue is on a cross section cut across the stem. This [woody](#) material also has a structural function and forms the supporting skeletons of many cacti.

Vegetative - growth of leaves and [stems](#) as opposed to [flowers](#). A method of non-sexual reproduction by means of offsets, cuttings.

Vein - a strand of [vascular](#) tissue in a flat organ such as a [leaf](#).

Venation - the arrangement of veins within a structure.

Ventricose - distended or inflated.

Vermiculate - worm-shaped.

Verrucose - of a surface covered with warty protrusions.

Versicolor - variable in colour.

Verticillate - arranged in [whorls](#).

Vesicle - a hollow structure or cavity which may be macroscopic like a bladder or microscopic

as in a sub-cellular organelle.

Vessel - (trachea) - an efficient fluid conducting structure in most angiosperm xylem, which has evolved from the primitive tracheids found in gymnosperms and ferns by loss of the end walls of the cells so that each vessel runs for several cell-lengths, reinforced by rings and spirals of cellulose fibrils thickened with lignin.

Vestigial - reduced to a rudimentary structure.

Villous - with long soft hairs.

Vine - a plant with a weak trailing stem which relies on other plants or structures for vertical support.

Violacea - violet coloured.

Viperina - snake-like.

Virgate - slender, twiggy or wand like.

Hence: Virgatus (-a, -um).

Virid (-is, -i) - green.

Viridiflorus (-a) - with green flowers.

Viridescens - becoming green.

Viridifolius - with green leaves.

Viridifuscus - green-brown.

Viridissimus - very green.

Viridulus - somewhat green.

Virus - a simple parasitic micro-organism consisting of little more than a package of genetic material (DNA or RNA) in a protein or lipid envelope, capable of invading the host's cells and replicating only by harnessing their biochemical machinery. Some viruses carry several genes for synthesis of virus-specific proteins. Others (e.g. potato spindle tuber virus) consist of a circle of DNA which is too small to carry any structural genes.

Viscaria - sticky.

Viscid (-a, -m) - covered with a sticky secretion.

Vittata - with lengthwise stripes.

Viviparous - germinating or spouting from a seed, bulbil or bud while still attached to the parent plant.

Vulgaris - common.

Vulpinus - fox-like.



W

Wall - See: [cell_wall](#), [Exine](#), [Pericarp](#)

Wall pressure - inward force exerted by a [cell wall](#) on the cell contents by virtue of the elastic properties of the cell wall and by pressure from surrounding cells.

See also: [turgor pressure](#)

Wardian Case - a glazed terrarium created by Dr Nathaniel Bagshaw Ward (1791-1868) in about 1829 for transporting plants and growing delicate mosses and ferns.

Wax - a diverse group of naturally-occurring greasy, hard, or soft and moldable high molecular weight solid substances of animal, [plant](#) or mineral origin. Wax may contain saturated hydrocarbons, esters of higher fatty acids, and higher alcohols. Most natural waxes contain a wide range of molecular sizes and therefore soften over a wide temperature range instead of melting at a specific temperature, as do substances of a uniform molecular size.

Weed - a [plant](#) growing in the wrong place.

Whorled - of leaves or other parts, not [alternate](#) or [opposite](#) but placed in a circle around the stem.

Wilt -

- i. to droop, usually due to loss of turgor pressure.
- ii. any of several diseases that cause plants to wilt and die.

Window - a translucent portion of the leaves of some [succulent plants](#) which allows light to penetrate to the photosynthetic layers.

Wood -

- i. a hard fibrous substance composed of cellulose bonded together with lignin formed as the main fluid conducting tissue or [xylem](#) making up the greater part beneath the [bark](#) of the [trunk](#), [branches](#) and roots of [trees](#), [shrubs](#) and other [woody plants](#).
- ii. a dense growth of trees, somewhat smaller in extent than a [forest](#).

Wood gum - [xylan](#)

Wood sugar - [xylose](#)

Woody - made of or resembling [wood](#). Of plant tissues hardened by accumulation of [lignin](#).

Woolly - thickly covered with long [hairs](#).

Wort - archaic Middle English word for any plant or herb, often one considered medicinal or otherwise useful in combination with a word describing the use e.g. lousewort, lungwort, [glasswort](#)

Old English: *wyrt* = herb, root.

Wrinkled - creased or folded up irregularly in every direction.



X

Xanthophyll - a class of orange oxygenated carotenoid pigments in which one or more double bonds of a carotene have been substituted with hydroxy, methoxy, carboxy, epoxy and oxo (ketone) groups. Like [carotene](#), xanthophylls assist photosynthesis.

Xenogamy - (Greek: *xenos* = stranger + *gamos* = marriage) cross pollination.

Xenograft - a graft from a different species

Xeranthemoides - with a dry appearance.

Xeromorphic - structural features of [plants](#), [xerophytes](#), adapted to dry conditions with a thickened cuticle or [hairs](#) protecting against moisture loss or with the appearance of such plants.

Xeriscape - an arid landscape or water-conserving garden in which [xerophytic plants](#) grow. A desert garden.

Xerophyte - a [plant](#) adapted to dry conditions.

Xylan - a yellow water-soluble gummy polysaccharide component of the [hemicellulose](#) of woody tissues, made from (1-4) linked [xylose](#) monomers. Derivatives may have arabinose (arabinoxylan) or 4-O-methylglucuronic acid (glucuronoxylan) side chains.

Xylose - (Greek: *Xylon* = wood) a white crystalline pentose (five-carbon) sugar isomeric with ribose, produced by hydrolysis or fermentation of [xylans](#) in straw or wood and an important dietary constituent of herbivores. Used in foods for diabetics as it can not be metabolised by humans. Non-fermentable by normal yeast.

Xylem - the main upward water-conducting tissue in [vascular plants](#) characterised by [tracheary](#) elements. Xylem may also be a supporting tissue, especially secondary xylem ([wood](#)).



Y

Yarda - Yarfa - a peaty bog.

Yeast - a unicellular [Ascomycete](#) that typically multiplies by a budding process, although some yeasts (e.g. *Sacharomyces pombe*) multiply by symmetrical division. *Sacharomyces* species are important mediators of the commercial fermentation of carbohydrates to alcohol.

Yield - measurable produce of economic value, related to a specified crop or animal, or to a defined area, and to a period of time.



Z

Zebrinia - with striped leaves.

Zebrinus (-a, -um) - zebra-striped.

Zephyr - of the west.

Zoophilous - pollinated by animals, especially other than insects e.g. bats.

Zonatus - with concentric markings.

Zone - a distinct geographic region exhibiting [characteristics](#) distinct from neighbouring regions.

Zygomorphic - bilaterally symmetrical.

Zygote - a fertilised reproductive [cell](#) formed by the merging of two [gametes](#), before any cell division occurs.



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