

Glossary - Taxonomy of Botanic

Anther: (Gk. anthos, flower) see flower parts.

Auricle: An earlike flap of tissue at the base of a leaf-blade, curiously shaped in grasses.

Bark: The ruptured original cortex and epidermal layer of the seedling when secondary growth takes place; it consists mainly of periderm, underlying phloem and many layers of cork-cells that die but remain in place to make the outer protective bark.

(D = Borke) The dead outer often ruptured layers of periderm.

(D = Rinde) The periderm; living tissue sealing and protecting the plant from fungal spores, viruses and preventing loss of water.

Blade: see leaf parts.

Bisexual: With fertile stamens and fertile ovary present in the same flower; hermaphrodite.

Branching System: see growth.

Bud: (D = Knospe) In deciduous plants; the structural protection of the apical meristem (new generation of leaves and blossoms) after a period of "hibernation"; an undeveloped sprout.

- **B. Scale:** (D = Knospen-Schuppe) Protective tissue of solid, firm structure protecting the developing sprout. Can be smooth, felt-like, sticky, mono-or multilayered.

- **B. Position:** can be decussate, distichous, or divergent.

Bristle: A stiff spine or fine projection, often referred to as hairs.

Spine: A hard, sharp-pointed outgrowth of the epidermis, usually a modified leaf, or part of a leaf (compare thorn).

Tendrill: (L. tendere to extend) A modified leaf or part of a leaf or stem modified into a slender coiling, clasping, or twining structure that aids in support of the stems; tendrils occur only in some angiosperms.

- **Leaf T.:** (D = Blattranke) A tendril borne out of the middle lamella of the leaf.

- **Petiole T.:** (D = Blattstiel-Ranke) A tendril borne out of a stalk of a leaf.

- **Sprig T.:** (D = Sprossranke) A tendril borne out of a sprout.

Thorn: A hard, woody (lignified), pointed modified branch, originating from the vascular cambium (compare spine).

Bud: see branching system.

Calyx: see flower parts.

Capitulum: see inflorescence, types of.

Carpel: (Gk. karpos, fruit) The inner floral whorl; each carpel encloses one or more ovules. One or more carpels form a gynoecium (D = fruchtknoten).

Various types of placentation are distinguished (for ripened ovary see fruit):

Apocarp: (Gk. apo, away from) Two or more free standing carpels form the gynoecium.

Paracarp: (Gk. para, beside) Two or more carpels merge completely, forming a cylindrical ovule, where the seeds are located either at the central placenta (free central) or externally at the inner walls of the carpels (parietal).

Syncarp: (Gk. syn, together with) Intermediate stage of apo- and paracarp; the contact zones fuse forming septa, but leaving the individual carpels unchanged (axile).

Conifer: A cone-bearing tree like pines and firs etc.

Corm: see stem.

Corolla: see flower parts.

Cortex: *Ground-tissue* or parenchymatic tissue of the *stem* bounded externally by the epidermis and internally by the phloem of the vascular system or by the pericycle in *roots*; and cork, a tissue in secondary plants which is impermeable to water and gases (D=rindenparenchym).

Cotyledon: (Gk. kotyledon, cup-shaped, hollow) Seed leaf; generally stores food in dicotyledons and absorbs food in monocotyledons (D. keimblatt) - for comparison monocot - dicot see very end of glossary.

Dicot.: Dicotyledons - One of the two classes of angiosperms; are characterized by having two cotyledons, net-veined leaves often revealing secondary growth; vascular bundles are arranged along a circular pattern (eustele); usually taprooted (allorhizic); flower parts usually in multiples of fours or five's (decussate).

Monocot.: Monocotyledons - plant embryo has one cotyledon; flower parts usually in multiples of three (decussate); no true secondary growth (D = krautig); fibrous root system (homorhizic); widely distributed vascular cambium (ataktostele).

Epicotyl: The upper portion of the axis of an embryo or seedling, above the cotyledons (seed leaves) and below the next layer of leaves.

Hypocotyl: The portion of an embryo or seedling situated between (as well as under the soil) the cotyledons and the radicle, e.g. taproots.

Cuticle: Waxy or fatty layer on the outer wall of epidermal cells facing the surrounding environment.

Deciduous: Falling off, as with leaves in the autumn; in moderate climatically regions.

Decussate: see leaf position.

Dichotomous: Divided into two equal forks, and often forked again and again, see also growth, dichasial.

Dicot: see cotyledon.

Dispersion: see leaf position.

Distichious: see leaf position.

Evergreen: Remaining green throughout the year, particularly of leaves that persist on the stem throughout the winter or dry season.

Filament: see flower parts.

Floral Tube: A cup or tube formed by the fusion of the basal parts of the sepals, petals and stamen.

F. Formula: A useful convention to summarize flower structure and provide a convenient short-hand description of flowers:

*....radial symmetrical; ??....zygomorphic

K....calyx; C....corolla; P...perigon;

A....androecium; G....gynoecium; location of bar indicates superior/inferior position of the ovary;

index....number of leaves referring to the individual letter; () partly grown together;

Flower: The reproductive structure of angiosperms; a complete flower includes pedicel, perianth (calyx, corolla), androecium (stamens), and gynoecium (carpels), but all flowers contain at least one stamen or one carpel.

Compound F.: A number of individual florets makes up the final composition as seen in sunflower (*Helianthus annuus*).

Floret: A small flower, usually one of a dense cluster, as in compositae.

Zygomorphic: Irregular, divisible in one plane only into two equal halves.

Parts of the F.:

Pedicel: The stalk of an individual flower in an inflorescence.

Receptacle: Housing the androecium, gynoecium, perianth:

- **Androecium:** The stamens, which bear the filament and the anther (pollen) - see androecium.

Anther: (Gk. anthos, flower) The pollen-bearing portion of the stamen.

Filament: The slender stalk of the stamen which bears the anther.

Stamen: (L. stamen, thread) The part of the flower producing the pollen, composed (usually) of anther and filament; collectively, the stamens make up the androecium.

- **Gynoeceum:** The ovules enclosed in the ovum tipped with the stylet and the stigma - see gynoecium.

Ovary: see there.

Ovule: The structure containing the egg (megaspore) and the development of the female gametophyte (embryo sac), which after fertilization becomes the seed (see carpel).

Stigma: The part of the female organ which receives the male pollen, it is normally situated at the top of the style. The stigma is sometimes lobed (stigma-lobe), less commonly radiated.

Style: A more or less elongated projection of the ovary which bears the stigma.

- **Perianth:** The outer non-sexual parts of the flower, usually composed of two whorls, often with the outer sepals green (sometimes grown together), the inner petals colored (sometimes grown together), or both whorls green or colored; the perianth segments are the individual organs comprising the two whorls (D = bluetenhuelle).

Calyx: The sepals collectively which are part of the perianth; often joined together in a tube, the calyx tube (D = kelch) often green in color.

Claw: The narrow stalk-like part of the petal.

Corolla: (L. corona, crown) The petals collectively, often joined together into a tube - the corolla tube; usually the conspicuously colored flower whorl (D = krone).

C. Tube: A tubelike structure resulting from the fusion of the petals along their edges.

Petal: A flower part of the perianth, usually conspicuously colored; one of the units of the corolla (D = kronblaetter).

Sepals: (L. sepalum, a covering) One of the outermost perianth structures, usually green and protecting in bud; a unit of the calyx; sepals usually enclose the outer flower buds in the bud (D = kelchblaetter).

Tepal: One of the units of the perianth that is not differentiated into sepals and petals as seen in tulips (D = perigon, blütenhülle ohne Krone u. Kelch).

Fruit: In angiosperms only, a mature, ripened ovary (or group of ovaries), containing the seeds, together with any adjacent parts that may be fused with it at maturity.

Pericarp: (Gk. peri, around; karpos, fruit) The fleshy or dry parts surrounding the seed:

- **Endocarp:** (Gk. endo, within; karpos, fruit) The innermost layer of the mature ovary wall, or pericarp.
- **Exocarp:** (Gk. exo, without; karpos, fruit) The outermost layer of the mature ovary wall, or pericarp.
- **Mesocarp:** (Gk. mesos, middle; karpos, fruit) The middle layer of the mature ovary wall, or pericarp, between the exocarp and endocarp.

Classification of F.:

Simple or syncarpic F.: (D=einzelfrucht) The result of a merged carpel (syncarp); cracks open once ripe.

- **Dehiscent F.:** Mature pericarp breaks open freeing the seeds; dry mesocarp.
Follicle: Single carpel that splits down a single side at maturity, e.g.: *columbines, milkweed*.
Legume: Two fused carpels, which split along both sides once ripe, e.g.: *pea*.
Silique: At maturity the two sides of the fruit split off, leaving the seeds attached to the central portion e.g.: *mustard*.
Capsule: A dry fruit formed from two or more fused carpels which disperses the seeds via tiny openings once ripe, e.g.: *poppy*.
- **Indehiscent F.:** Seeds remain in the fleshy mesocarp after fruit has been shed from the parent plant.
Drupe: Fruit with an inner hard stone enclosing the seed; e.g.: *peaches, coconut, cherry, olives*.
Berry: A fleshy many-seeded rounded fruit, e.g.: *tomato, grapes, dates, pumpkin*.
Pomes: Seeds in a compound inferior ovary with tough endocarp e.g.: *apple, pears*.
Nut: A one-seeded fruit with a hard outer covering (endocarp); resembling achene; e.g.: *hazelnut*,
Achene: One-seeded fruit with many free-lying seeds on one fruiting head; e.g.: *loewenzahn*,
Samara: Winged achenes, such those found in elms and ashes e.g.: *Acer platanus*.
Cypsela: Complex achene-like fruit borne from an inferior ovary, usually with papus, e.g.: *Asteraceae*.
Caryopsis: Achen-like fruit that occur in grasses (Poaceae) or grain.

Aggregated or apocarpic F.: (D = sammelfrucht) The result of a separated carpel (apocarp) containing fruitlets with an appearance generally resembling the outer shape of a single fruit.

- **Hip:** One fleshy receptacle which houses many seeds e.g.: *rose, magnolias*.
- **Cone:** The individual sub-fruits develop into a cluster forming the entire unit; e.g.: i.e.: *raspberries, strawberries*.

Multiple or paracarpic F.: (D = fruchtstaende) The result of a completely fused carpel (paracarp) revealing a circular inner structure where the ripe seeds are located; e.g.: *pineapple, ficus* (inflorescence appears to become a single unit in which the flowers are incorporated; the meristem will be used up entirely).

Glume: A chaff-like bract; in particular the bracts at the base of the spikelets of Gramineae.

Growth: In plants it is characterized by growth in height (primary G.) and thickness (secondary G.).

Monopodial G.: Continuation of the branch (in spring) via the terminal sprout as seen in gymnosperms (top terminal bud formed by the apical meristem) grow along a straight axis.

Sympodial G.: The terminal bud (apical meristem) is consumed by the early blossom; continuation of the branch therefore is taken over by the lateral buds, hence growth occurs in a more or less crooked manner, as seen in angiosperms - two distinct growth patterns can be distinguished:

- **Dichasial SG:** Both lateral buds grow into strong branches, resulting in a fork-like continuation.
- **Monochasial SG:** One pseudoterminal bud (in a zweizeilige plant) dictates the direction of growth, resulting in a more or less zig-zack continuation of growth, which later on, due to secondary growth develops into a straight line.

G. Development:

- **Acrotonic:** Growth is intensified in the upper part of the plant, leading to a more or less canopic enhanced shape.
- **Basotonic:** Growth is intensified on the lower part of the plant, resulting in a triangular shaped organism.
- **Mesotonic:** A mixed pattern of plant development, resulting in a columnar appearance.

Inflorescence: A flower cluster and their bracts, with a definite arrangement of flowers (D = Blütenstand).

Bracteous I.: Inflorescence with reduced bracts (poorly developed leaves).

Frondose I.: (L. frondos, lush) Bracts (leaves) well developed.

Naked I.: Without any bracts.

Types of I.:

Cymose: A broad, more or less flat-topped simple or compound flower cluster, with the central flowers opening first; typical in sympodial growth.

- Simple C.: The terminal bud of the inflorescence ceases to progress any further.

dichasic: The terminal bud stops progressing, the two lateral 1st order buds branch out symmetrically, followed by the 2nd order buds and so on (D = dichasial).

monochasic: One lateral buds generates a 1st order branch, followed by a 2nd on top of the 1st, and so forth, following a spiral path (D = monochasial).

- Complex C.: The lateral inflorescence reach a very complex branching pattern of higher order.

Cynoic: (D = cynoid)

Racemose: Having flowers in a raceme-like (youngest flowers and branches at the apex and the oldest at the base) inflorescence; common in monopodial growth.

- Simple R.: The inflorescence has unbranched processes (1st order); monopodial.

Raceme: (D = traube) Elongated main axis where single flowers are borne on stalks that are about equal in length.

Spike: (D = aehre) Elongated main axis where flowers lack stalks.

Strobilus: (Gk. strobilus, cone; D = kolben) Modified stalk-less leaves (sporophylls) grouped terminally on a stem; a cone; e.g.: *Zea mays*.

Capitulum: A head of small stalkless flowers crowded together at the end of the stem, in Asteraceae.

Disk: (D = koepfchen) Stalk-less flowers are crowded together at the receptacle which surrounds or surmounts the ovary.

Simple Umbel: (L. umbella, sunshade; D = dolde) A cluster of flowers whose spreading stalks arise from the apex of the stem, resembling the spokes of an umbrella.

- Complex R.: The inflorescence has multiple processes of 1st and higher order; monopodial.

Double Raceme: (D = doppeltraube) Every racemous process lacks a terminal bud, but as many simple racemous processes (1st and 2nd order) itself.

Compound Raceme: (D = rispe) Every racemous process terminates with a bud and hosts multiple racemous processes of 2nd and 3rd order.

Compound Umbel: (D = doppeldolde) A simple sub-umbel (2nd order) on top of each stalk of the major umbel (1st order).

Thyrasic: (D = thyrsus) A compound with monopodial main axis and sympodial lateral processes.

dichasic: Inflorescence occur only at the apex of the organism; the terminal buds of all lateral processes stops progressing, the two lateral 1st order buds branch out symmetrically (forked), followed by the 2nd order buds and so on.

monochasic: Inflorescence occur only at the apex of the organism; the terminal bud of one lateral process stops progressing, leaving growth to the buds of higher order, resulting in a spiral or helical shape; e.g.: catkins

Involucre: A collection of bracts or leafy structures surrounding a flower head, groups of flowers, or a single flower.

Herb: An annual plant which has no woody stem and is soft and leafy; also an aromatic plant used in seasoning or medicine annual plants; (D = krautig).

Leaf: A thin, expanded organ which is usually green and synthesizes food, arising from the node of a stem and commonly with a leaf-stalk or petiole and less commonly with basal stipules; leaves are shedded in winter when the soil is frozen, hence water circulation inhibited.

Anisophyll: Leaves of different size but same shape are found on one plant, i.e.: *Acer platanus*.

Heterophyll: Leaves of different shape and size can be found on one plant, i.e.: *Hedera helix*.

Paired: The apical leaf in compound leaves is missing.

Unpaired: The apical leaf in compound leaves is present.

- L. **Position:** A mathematical approach (divergent) describes the angle between two subsequently following leafs regarding the turns (upper part of the fraction) and the number of leaves passed (lower part of the fraction) when counted along a virtual circular motion around the stem (from top to bottom) e.g.: divergent of 1/2; 1/3....2/3....2/5....3/8 etc.

Law of alternation: Leaves of one node fall into the gaps of the following node.

Law of equal distances: The angle between leaves of one node is constant;

- **Decussate:** (D= wirtel) Opposite; of leaves of one node which are borne in opposite pairs with each successive pair (of the following node) lying at right angles to the next, and hence leaves in four ranks. (both laws of alternation and equal distances apply).
- **Dispersion:** (D = schraubig) Every node hosts one leaf; leaves on the following node are shifted by a certain angle to the first one following a spiral pattern (law of equal distances).
- **Distichious:** (D = 2-zeilig) Every node hosts one leaf; opposing leaves meet at approx. 180°.
- **Rosette:** (D = scheinwirtel) The arrangement of leaves, radiating outward from the center, which overlap due to "compressed" inter-nodes.

L. **Scar:** A scar left on a twig when a leaf falls revealing the vascular bundle; in deciduous plants.

Parts of L.: Blade and Petiole make account for the upper leaf, whereas base of the leaf and stipules (if present) account for the lower leaf.

Blade: (D = lamina) The flattened part of an organ, such as a leaf or petal.

Petiole: The stalk of a leaf.

Types of L.:

Bract: (D = tragblatt) A little leaf or scale-like structure from the axis of which a flower often arises.

Stipule: (D = nebenblatt) A scale- or leaf-like appendage at the base of the leaf stalk; usually paired.

Succulent: A plant with fleshy, water storing stems or leaves; usually found in CAM-plants.

Lenticel: (L. lenticella, a small window) Spongy areas in the cork surface of the stem, roots, and other plant parts that allow interchange of gasses between internal tissues and the atmosphere through the periderm; occur in vascular plants; tiny little bursts due to secondary growth.

Life, form of: Adaptation of a plant to its environment (location).

Chamaephyta: Plants which carry their buds at least 10 to 50 cm above ground; during cold season covered with snow, hence protected from chill; e.g.: plants of the tundra.

Cryptophyta: Buds are located underground either in rhizomes, tubers (potato) or corms (onions).

Hemicryptophyta: Buds are lie on the surface (grass), hibernating rosette-plants, shrubs with above-ground runners which shed their leaves during the cold season (perennials).

Phanerophyta: Buds located at elevations higher than 50cm above ground (trees and shrubs).

Therophyta: Annual plants which shoot dies after one season; hibernate by forming chill-resistant seeds.

Meristem: (Gk. merizein, to divide) The undifferentiated, embryonic plant tissue from which new cell arise.

Apical M.: (L. apex, tip) The meristem at the tip of the root or shoot in a vascular plant, responsible for primary growth.

Lateral M.: Meristems that give rise to secondary tissue; vascular and cork cambium are responsible for secondary growth (absent in and annual plants like herbaceous).

-oecious: (Gk. oikos, house) Referring to their reproductive organs and their location.

Dioecious P.: (D = zweihäusig; Gk. di, two) Unisexual; having the male and female (or staminate and ovulate) elements on different individuals of the same species.

Monoeceios P.: (D = einhäusig Gk. monos, single) Having the anthers and carpels produced in separate flowers on the same individual.

-oecium: (Gk. oikos, house) The reproductive organs within the flower; see flower -parts.

Androeceum: The stamens, which bear the filament and the anther (pollen).

Gynoeceum: The ovules enclosed in the ovum tipped with the stylet and the stigma.

Ovary: see there **Ovary:** The part of the flower containing the ovules and later seeds, usually with one or more styles and stigma (see also carpel).

Placenta: The part of the ovary to which the ovules are attached (see also carpel).

O. **Position:** The position of the ovary relative to the attachment of the other organs.

- **Epigynous O.:** (Gk. epi, upon; gyne, female) A pattern of floral organization in which sepals, petals, and stamen apparently grow from the center of the ovary (D = mittelstaendig).

- **Hypogenous O.:** (Gk. hypo, under; gyne, female) Floral organization in which the sepals, petals, and stamen are attached to the receptacle below the ovary; also known as superior ovary (D = oberstaendig).

- **Perigynous O.:** (Gk. peri, around; gyne, female) A form of floral organization in which the sepals, petals, and stamens are attached to the rim of a cup-shaped extension (enclosing the ovary) of the receptacle; superficially, the sepals, petals, and stamens appear to be attached to the ovary; also known as an inferior ovary (D = unterstaendig).

Ovule: see flower parts.

Panicle: A branched inflorescence, or more precisely a branched racemose inflorescence (found in grasses).

Pedicele: see flower parts.

Petal: see flower parts.

Perianth: see flower parts.

Pith: see stem parts.

Placenta: see ovary; for types of placentation see carpel.

Plant: The root and the shoot (stem and leaves); from the cell to tissue and organ (leaf) to the organism (plant).

Annual P.: A species with a life cycle which takes approximately 12 months or less to complete; grow from a seed to maturity producing fruits and new seeds and subsequently die, all in one season (D = staude).

Biennial: A plant which feeds and grows in the first year, and fruits in the second year.

Flowering P.: The monocots and dicots (see cotyledon).

Perennial P.: (L. per, through; annus, year) The vegetative structures live year after year; e.g. strauch, tree.

Deciduous P.: (L. decidere, to fall off) Shedding leaves at a certain season - acts as a water saving procedure when cold and icy winters limit the availability of liquid water.

Pollination: The transfer of pollen from an anther to a stigma.

Monoeceus P.: (D = einhäusig Gk. monos, single; oikos, house) Having the anthers and carpels produced in separate flowers on the same individual.

Dioecious P.: (D = zweihäusig; Gk. di, two; oikos, house) Unisexual; having the male and female (or staminate and ovulate) elements on different individuals of the same species.

Allogamy: Pollination not executed by itself, instead other means are used like wind (allochory) or animals (zoochory) which implies a coevolutionary development of animal and plant.

- **Dichogamy:** Temporarily shifted ripening of male and female sex organs to prevent autogamy.

- **Genetic Incompatibility:** Fertilization inhibited due to genetic incompatibility.

Autogamy: Pollination executed by the plant itself; in certain cases the flower does not even open any more (Cleistogamy).

Receptacle: see flower parts.

Rhizome: see stem.

Root: The usually descending axis of a plant, normally below ground, hence lacking chlorophyll which serves to anchor the plant and to absorb and conduct water and minerals into it.

Allorhizie: The seedlings root develops into the main root system; additional roots may develop derived from the shoot e.g.: *Traxacum sp.* (D = loewenzahn), *Picea abies*.

Homorhizie: Root system derives from the stem only (primary H.) once the primary (embryonic) roots cease to function; very common in monocots (secondary H.).

Adventitious R.: Roots growing from stems or leaves (arising from areas other than the known sites)

Primary R.: Main root borne out of the radicle (w/n embryo) which later on branches, developing side roots

Types of R.:

Climbing R.: Internodial roots that are developed in plants which use them as holdfasts on a substrate; e.g. *Hedera helix*.

Primary R.: The first developing root system arising from embryonic tissue.

Prop R.: Aerial roots of plants increase mechanical support - as seen in tropical plants and palms; e.g.: mangroves *Laguncularia racemosa*.

Tap R.: (D = pfahlwurzler) The primary root of a plant formed in direct continuation with the root tip or radicle of the embryo in dicots and gymnosperms: forms a stout, tapering main descending root from which arise smaller, lateral branches; e.g.: *Daucus carota*.

Tuber: (D = wurzelknolle) A swollen part of the stem or root, formed annually and usually underground e.g.: sweet potato (*Solanum tuberosum*).

Sepals: see flower parts.

Shrub or Bush: (D = Staude) An annual plant, revealing basitonic growth, where the above-ground shoot dies after one season, i.e. after seed matured.

Shrublet: (D = Strauch) A small woody-stemmed plant, usually less than 30cm tall and often creeping over the ground, revealing basitonic and sometimes mesotonic growth pattern, where the above-ground shoot grows for many seasons (perennial).

-sperm: (Gk. sperma, a seed) A mature male gamete, usually motile and smaller than the female gamete.

The structure of angio- and gymno-sperm is commonly made of the cotyledon, vegetative body (roots, stem, and leaves) and the reproductive body (flowering parts).

Angiosperm: (Gk. angion, a vessel) Literally, a seed borne in a vessel (carpel); thus one of a group of plants whose seeds are borne within a mature ovary (fruit) of dioecious plants; monoecious plants are considered an evolutionary reduction of dioecious plants; compare gymnosperm.

Gymnosperm: (Gk. gymnos, naked) A seed plant with seeds not enclosed in an ovary; the conifers are the most familiar group.

Spiklet: In Gramineae, a group of one or more florets subtended by one or two sterile bracts or glumes, a little spike.

Spine: see branching system.

Sprout: (D = Trieb) young branches.

Long S.: (D = Langtrieb) Lignified with countless internodal sections set widely apart, contributing to increase in length (height and largeness) by indicating the direction (axis) of growth.

Short S.: (D = Kurztrieb) Lateral outgrowths, with many, short internodal sections, commonly unbranched with a limited, short period of growth (limited life expectancy).

S. Thorn: Thornlike buds, covered with bud scales.

Stamen: (L. stamen, thread) see flower parts.

Stem: The main axis of a plant which is both leaf-bearing and flower bearing.

The most conspicuous structures of the twigs during the cold season, are the buds at the tips, lateral, or auxiliary buds, the leaf scars (after leaves have been shed), the lenticells (once secondary growth occurred).

Internode: The part of the stem lying between two nodes.

Node: A point of the stem where one or more leaves arise.

Pith: (D = Mark) Part of the stems ground tissue system; it is located at the center and serves as a reinforcing element increasing strength and stability.

Types of S.:

Corm: A swollen underground stem surrounded by scales (tunic) and replaced annually by a new one e.g.: onion (*Allium cepa*).

Rhizome: A creeping underground stem which sends up new leaves and stems each season, e.g.: mangrove.

Succulent: A plant with fleshy, water storing stems or leaves; e.g.: *Aloea vera*.

Thorny Sprout: Thornlike buds, covered with bud scales; e.g.: *Prunus spinosa*.

Stengel: Wenn die sprossachse krautig ist und im herbst abstirbt.

Halm: Wenn der spross hohl und durch querscheidewaende deutlich gegliedert ist.

Schaft: Wenn der stengel nur aus einem einzigen internodienabschnitt besteht und mit einer bluetenstand abschliesst.

Stigma: see flower parts.

Stipule: see leaf types.

Style: see flower parts.

Tendrill: (L. tendere to extend) see branching system.

Tepal: see flower parts.

Thorn: see branching system.

Whorl: A circle of leaves or of flower parts.

Comparison between Monocots and Dicots

	MONOCOT	DICOT
embryonic leaves		
family	Liliaceae	Magnoliaceae
stem	herbaceous	woody
vascular bundle	Atactostele (randomly dispersed throughout stem)	Eustele (cylindrically oriented around center)
cambium	absent (no true secondary growth)	present (true secondary growth)
shoot	not - poorly branched	amply branched
fore leaf (b/w bract & flower)	<u>one</u> adorsally located	<u>two</u> transversally located
root system	sec. homeorhizy (short living prim. root; rhizome, corm, taproot used as	allorhizy (primary root utilized to store food, amply branched and long living)

	storage sites)	
leaf venation	parallel to archly patterned	netlike arrangement of veins
leaf blade	linear, long and narrow	entire, cleaved or pinnate
leaf position	tepals mostly decussated with 3 leaves per node	sepals and petals decussated with 5 leaves (rarely 4) per node