Vocabulary

- Taxonomy is the study of the classification of living things.
- Morphology is the study of the shape, general appearance, or form of an organism.
- Silviculture is the care and cultivation of forest trees.
- Ecology is the study of the relationships between living and non-living things and their environment.

Dendrology – the science of woody species. Greek: ***dendron*** – a tree and **logos** – science.

Woody plants – perennial herb with a secondary weight gain.

What is a Tree?

A tree is a woody plant with several distinguishing characteristics:

· Often reaches 15 feet (4.572 m) or more in height at maturity.

· Has a single trunk or dominant multiple trunks.

· Has no normal branches on the lower trunk.

· Has at least a partially defined crown.

· Usually larger than other plants and tend to be long-lived.

The growth form or shape, rather than size, is the feature that distinguishes a tree from other plants such as shrubs (Harris 1992). A shrub is a woody plant with multiple stems that is capable of growing to a height of 15 feet.

Distribution of woody species:

trees (with a strong trunk).

bushes (no trunk).

half-bushes (odrvenjava only in the lower part).

climbing plants (woody plants that can wrap or rely on trees or other substrate).

Broadleaves (*Angiospermae*, usually with a prominent leaf lamina).

Conifers (Gymnospermae, usually needle-like leaves – needles).

Evergreen

Deciduous

Indigenous (local, the nature of the growth in our country).

Non-native (exotic, do not grow with us from nature).

Distribution of trees according to height:

Trees I row: over 25 m

Trees II row: from 12 to 25 m

Trees III row: from 5 to 12 m.

Distribution shrub height:

High bushes: over 2.5 m

Medium height from 1 to 2.5 m

Low bushes: up to 1 m

Features trees

They are divided into morphological, ecological, biological, etc.

Morphological characteristics:

Root (shape, depth).
Tree (habitus) – height.
Trunk (diameter, growth direction).
Crown (shape, size, mode of branching).
Bark (color, thickness, structure).
Leaf (shape, size, color, position, hairiness, etc.).
Flower and inflorescence (shape, color, size, etc.).
Fruit (shape, color, size, etc.).
Shoots (color, size, shape and position of the bud).

Ecological features:

Relationship to environmental factors:

The climate: light, temperature, humidity, wind, rainfall.

Edaphic: soil, parent substrate.

Orographic: relief, exposure, slope, altitude.

Biogeographical distribution – areal.

Leaf surface

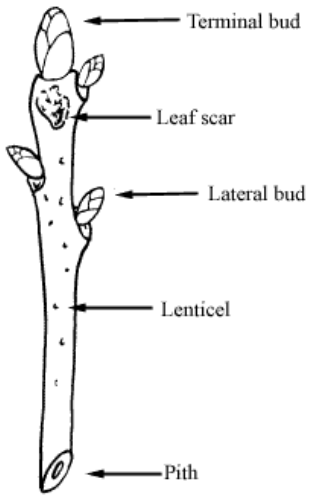
The surface and texture of the leaf are other means of identification. The hair, resin glands, waxes, blooms, and scales provide valuable clues in naming a tree. The texture of the leaf may feel like leather or like paper.

Twigs and Stem

Twigs are useful in identifying trees except for a short period during the spring when the buds are opening and shoots are elongating on these small branches. Several features of twigs, including buds, leaf scars, lenticels, pith, spurs, thorns, spines, and prickles, can help describe

them (table 5 and figure 21). Other factors to consider are color, taste, and odor. The color of the bark can be an most important feature on young stems.

Characteristic	Description
Bud	• Are one location of growth tissue in a tree. · • Are usually visible on the twig. · • May be either lateral, on the side of the twig, or terminal, at the tip of the twig. · • Are scaly or naked, smooth or fuzzy.
Leaf scars	• Are where a leaf falls from the twig. · • Vary in size and shape. · • Have one or more minute dots or patches that show where the ruptured strands of vascular tissue passed from twig to leaf.
Lenticels	• Are small, normally lens-shaped patches on the stem that facilitate gas exchange. · • May be wart-like.
Pith	• Is the central portion of the twig. · • Is usually lighter or darker than the wood that surrounds it. · • Varies in color. · • Is star-shaped or pentagonal in oaks, triangular in alders, terete or cylindrical-like in ash and elms, and chambered in walnuts. · • Varies in composition; in most cases is solid, spongy, or hollow.
Spurs	• Are dwarfed twigs with some internodal development. · • May grow for several years. · • Produce the fruit on many apple varieties
Thorns, spines, and prickles	• Pointed structures that project from the sides of a twig; are important features in some species. · • Thorns are modified twigs. · • Spines are modified stipules. · • Prickles develop from surface tissue and are easily removed.



Characteristic parts of a twig that help in the identification process.

Bark

Bark is one of the most important features for tree identification because of its year-round accessibility. It is especially useful when the tree's leaves and twigs are inaccessible or unavailable during the fall and winter. The shape of the bark is characteristic of some species, for example, the small, rectangular plates on flowering dogwood. Bark on young trees differs from that on more mature trees. Experience is the best way to learn bark characteristics.

Bark characteristics that can be used for identifying mature trees. Typical bark textures are illustrated in bellow:

Bark characteristics that help with identification

Characteristic	Description
shape or general appearance	The shape of the bark is often characteristic of some species, for example, the small-rectangular plates on the flowering dogwood.
Texture	The feel of the bark , such as the smoothness of cherry trees or the layering or plating of white oaks
Thickness	The thickness of the bark can vary within a species as well as between species.
Color	Bark color varies with age, location, site, and light conditions.

Smooth Furrowed Scaly Warty Shaggy

Smooth
Beech
Fagus sylvatica

Horizontal lenticles
Cherry
Prunus avium

Diamond lenticles
Aspen
Populus tremula

Peeling strips
Silver birch
Betula pendula

Vertical cracks
Hornbeam
Carpinus betulus

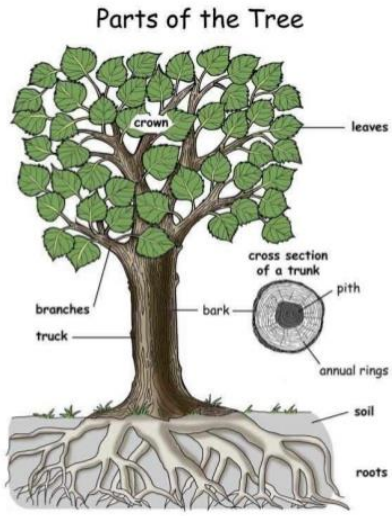
Plates
Scots pine
Pinus sylvestris

Intersecting ridges
Ash
Fraxinius

Ridges broken
horizontallly
Oak *Quercus*

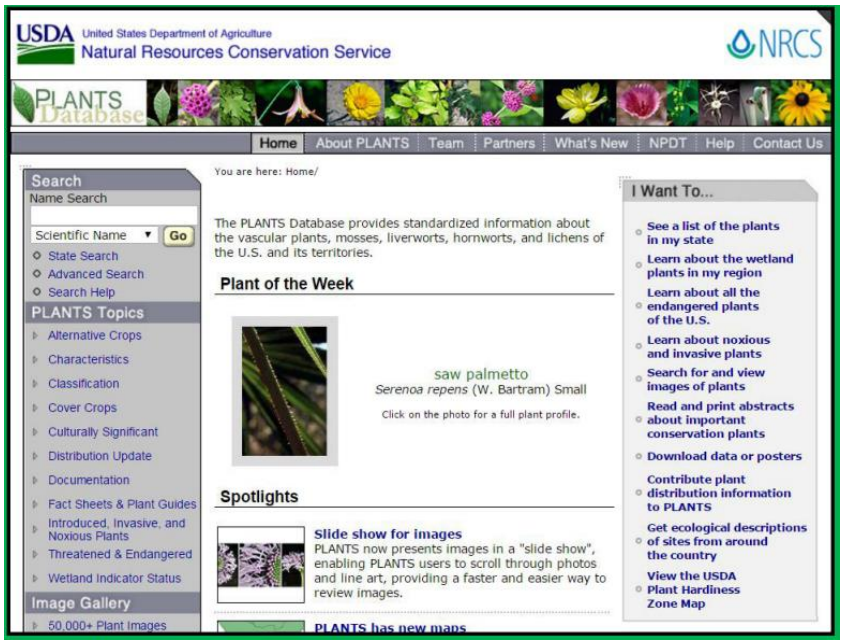
Curved Ridges
Sycamore
Acer

Fibrous
Sequoia
Sequoiadendron



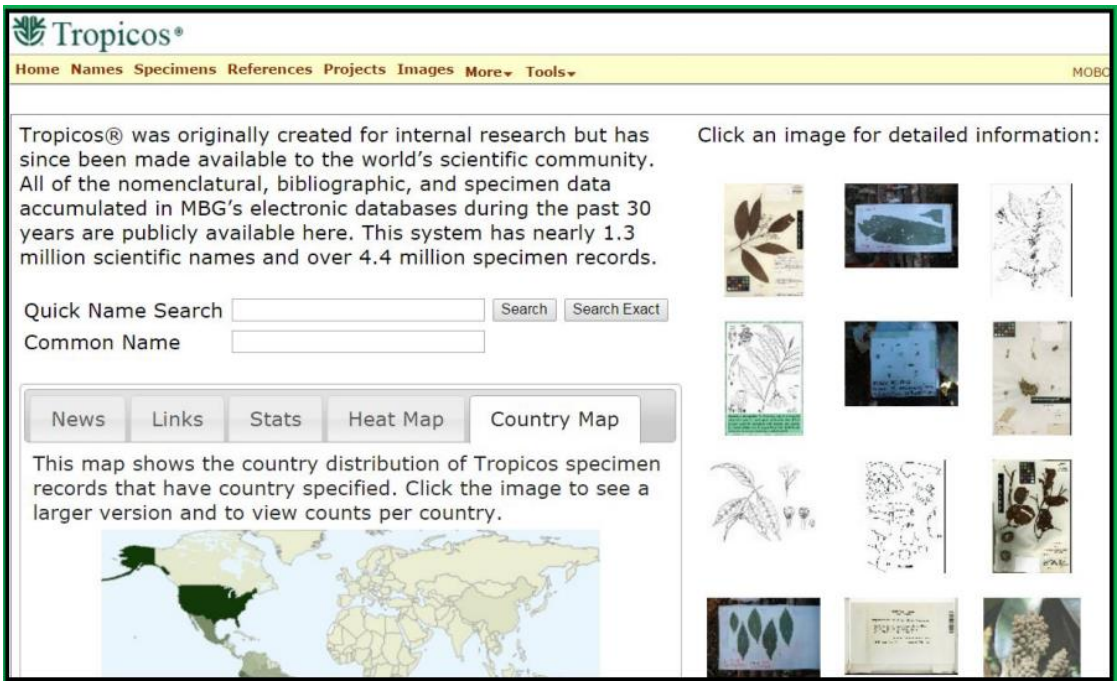
THE UNITED STATES DEPARTMENT OF AGRICULTURE

(https://plants.usda.gov/java/)

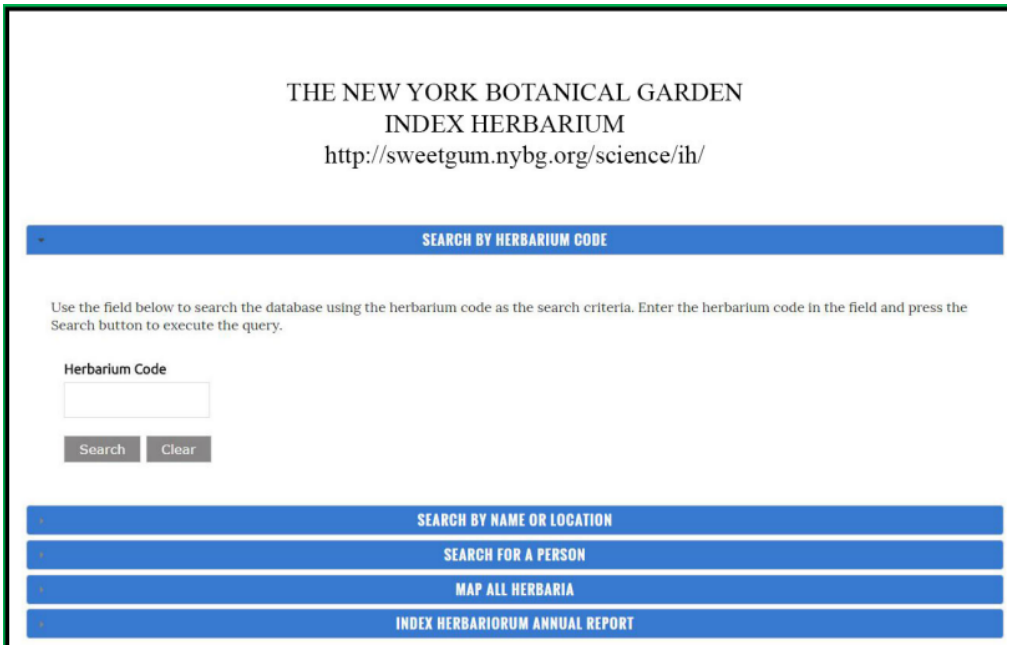


THE ROYAL BOTANIC GARDENS KEW
(http://www.ipni.org/)

MISSOURI BOTANICAL GARDEN
(http://www.tropicos.org/)



INFORMATION ABOUT THE HERBARIA OF THE WORLD
(http://sciweb.nybg.org/Science2/IndexHerbariorum.asp.html)



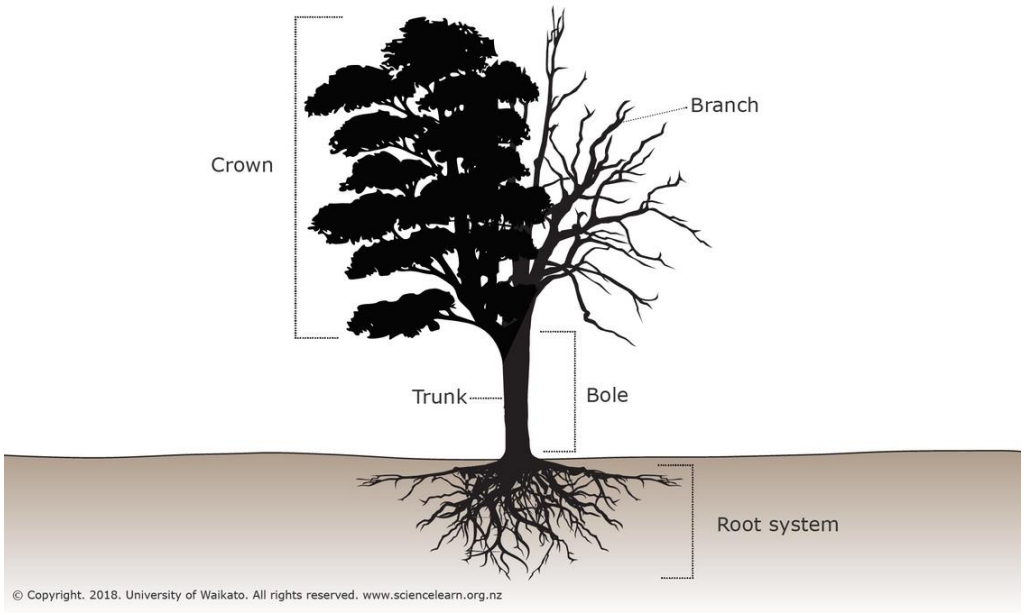
Useful for locating botanical specialists in plant families. Sending a specimen and images to a specialist is a good way to identify an unknown plant.

THIS WEBSITE HAS THE BEST PLANT IDENTIFICATION TOOLS FOR THE NORTHEASTERN UNITED STATES (https://gobotany.newenglandwild.org/)

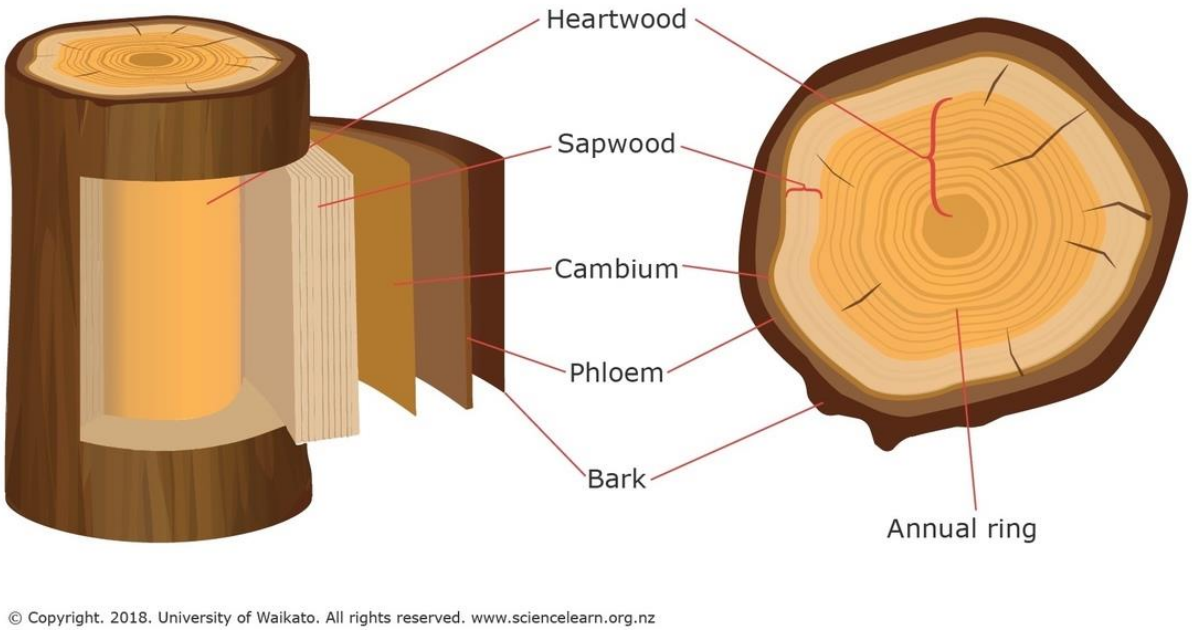
The WFO Plant List | World Flora Online

The information resource for Euro-Mediterranean plant diversity

Parts of a tree



Structure of a woody stem



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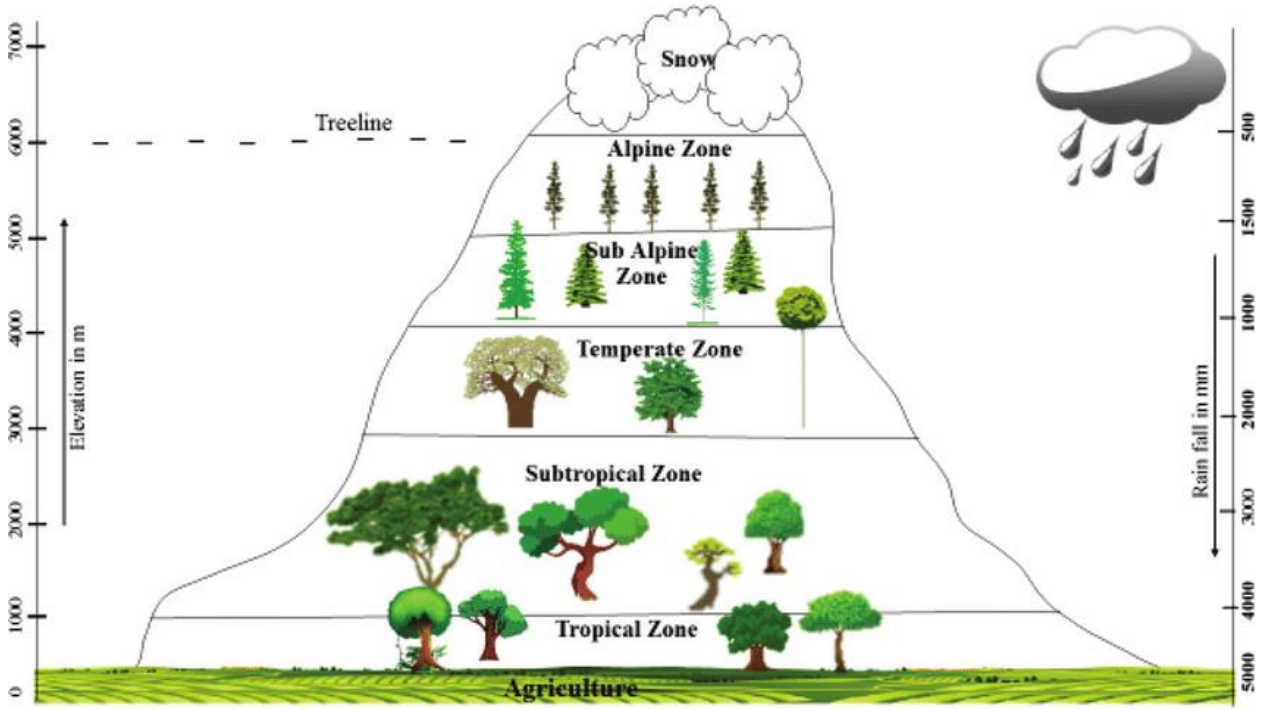
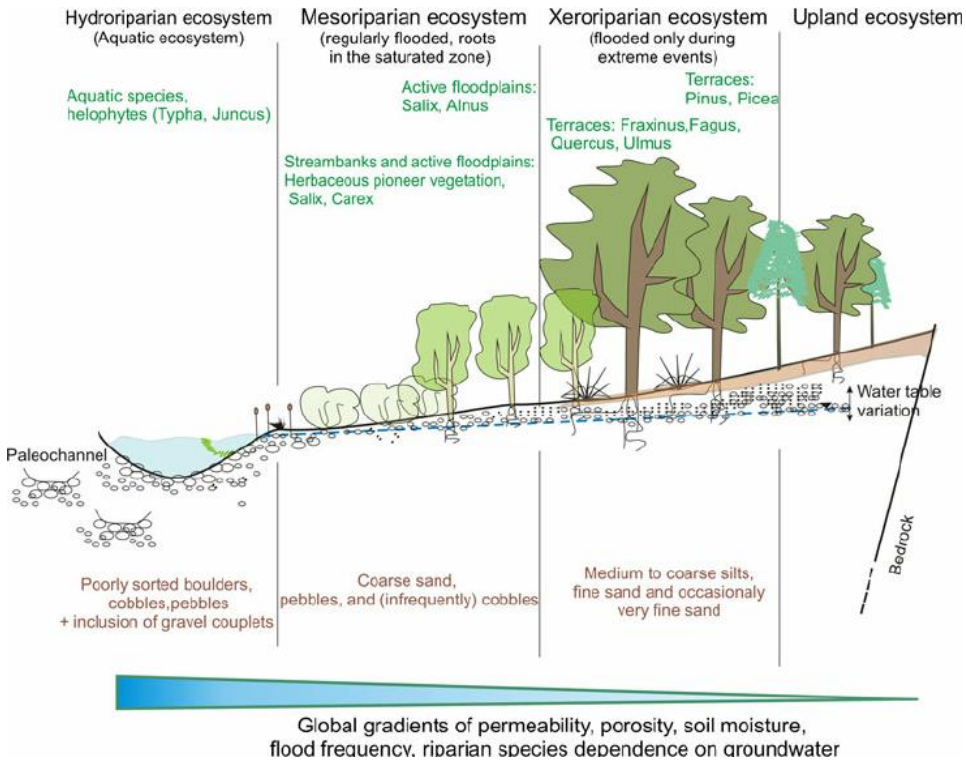

Snow
Treeline
Alpine Zone
Sub Alpine Zone
Temperate Zone
Subtropical Zone
Tropical Zone
Agriculture
Elevation in m
Rain fall in mm
7000
6000
5000
4000
3000
2000
1000
0
500
1500
1000
2000
3000
4000
5000


Hydroriparian ecosystem
(Aquatic ecosystem)
Mesoriparian ecosystem
(regularly flooded, roots in the saturated zone)
Xeroriparian ecosystem
(flooded only during extreme events)
Upland ecosystem
Aquatic species, helophytes (Typha, Juncus)
Active floodplains: Salix, Alnus
Terraces: Pinus, Picea
Terraces: Fraxinus,Fagus, Quercus, Ulmus
Streambanks and active floodplains: Herbaceous pioneer vegetation, Salix, Carex
Water table variation
Paleochannel
Bedrock
Poorly sorted boulders, cobbles,pebbles + inclusion of gravel couplets
Coarse sand, pebbles, and (infrequently) cobbles
Medium to coarse silts, fine sand and occasionaly very fine sand
Global gradients of permeability, porosity, soil moisture, flood frequency, riparian species dependence on groundwater

What Does That Mean?

acaulis	stemless	**micrantha**	small flowered
alba	white	**microphylla**	with small leaves
angustifolia	narrow-leaved	**millefolia**	with many (thousands of) leaves
annua	annual	**montana**	from mountains
argentea	silvery	**multiflora**	many flowers
arvensis	of the field	**nana**	small
aurantiaca	orange	**officinalis**	with herbal uses
aurea	golden, yellow	**pallida**	cream
australis	from the south (not necessarily Australia)	**palustris**	from marshes
autumnalis	of autumn	**parviflora**	small flowered
azurea	blue	**parvifolia**	with small leaves
caerulea	blue	**pauciflora**	few-flowered
caespitosa	dense	**paucifolia**	with few leaves
campanulata	campanulate, like a bell	**pendula**	hanging
campestris	of the field	**perennis**	perennial
canadensis	from Canada	**pinnata**	with pinnate leaves
capensis	from the Cape, South Africa	**polyphylla**	with many leaves, leafy
chinensis	from China	**praecox**	early, of spring
chrysantha	yellow	**prostrata**	prostrate
coccinea	red	**pumila**	small
compacta	compact	**punica**	red
decidua	deciduous	**purpurea**	deep pink
densiflora	dense-flowered	**pygmaea**	small
digitata	(leaves) like a hand, with 5 lobes	**quercifolia**	oak-leaved
esculenta	edible	**rosea**	rose pink
farinosa	floury, powdery	**rotundifolia**	round-leaved
flava	yellow	**rubra**	red
flora plena	with double flowers	**rupestris**	of hills
foetida	with an unpleasant smell	**sanguinea**	blood-red
glabra	smooth	**sativa**	cultivated
grandiflora	large-flowered	**saxatilis**	of rocks
hirsuta	hairy	**semperviva**	perennial
humilis	short	**sibirica**	from Siberia
japonica	from Japan	**spicata**	spiked
lanceolata	lance-shaped (leaves)	**spinosa**	spiny
latifolia	wide-leaved	**stellata**	starry
longiflora	with long flowers	**suphurea**	yellow
longifolia	with long leaves	**sylvestris**	of woods
lutea	yellow	**tenuifolia**	with thin, narrow leaves
macrantha	large flowered	**umbellata**	flowers in an umbel
macrophylla	with large leaves	**vernalis**	of spring
macrorrhiza	with large roots	**villosa**	hairy
maculata	spotted	**viridis**	green
majus	bigger	**vulgaris**	common
maritima	near the sea		