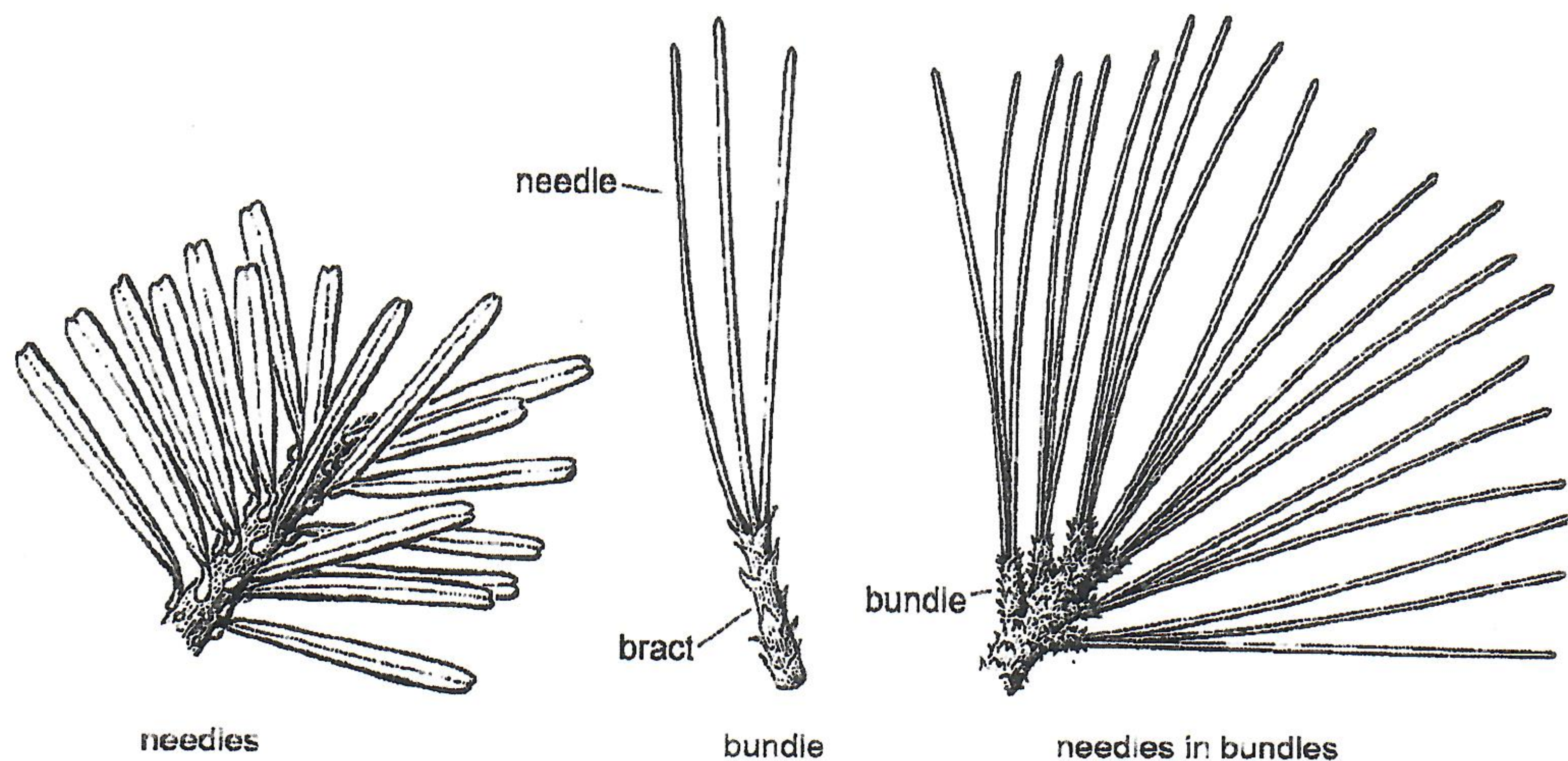


What's that Tree?

Botanical Skills Workshop



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Drawings by Matt Ritter

Glossary of Important Botanical Terms

Adapted from *A Californian's Guide to the Trees Among Us* - Matt Ritter

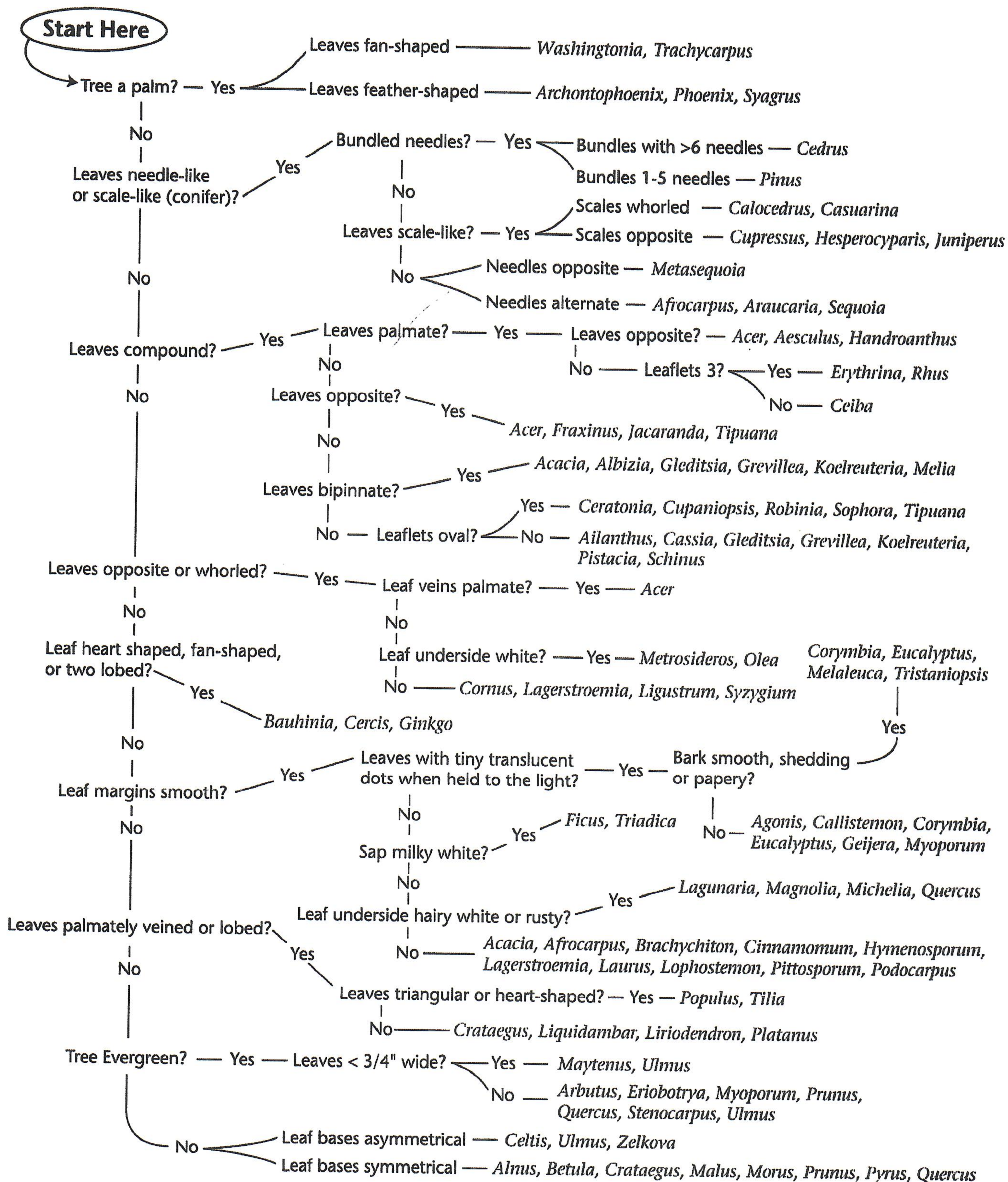
- Alternate leaf arrangement** — One leaf is attached per node on the stem.
- Axil** — The upper angle between the stem and the leaf or leaf stalk (petiole).
- Bipinnate** — Compound leaf form in which the primary leaflets are again divided into secondary leaflets.
- Blade** — The expanded photosynthetic portion of a leaf.
- Bud** — An immature shoot, often covered with protective scale leaves that will develop into a branch, flower, or inflorescence, found in the axil of a leaf and/or the terminal tip of a shoot.
- Compound leaf** — A leaf whose blade is divided into distinct leaflets.
- Entire** — Said of a leaf whose margins are continuous and smooth, toothless.
- Leaf** — A photosynthetic organ arising from a stem, usually with a stalk and a blade.
- Leaf arrangement** — The number of leaves attached at each node on the stem. Described as either alternate (1 per node), opposite (2 per node), or whorled (3 or more per node).
- Leaflet** — A smaller, leaflike unit of a compound leaf.
- Leaf Margin** — The edge of a leaf or other organ.
- Lobe** — An expansion or bulge on the margin of a structure such as a leaf or petal.
- Node** — The position on the stem to which structures, often leaves, are or were attached.
- Opposite** — Leaves that arise from the stem in pairs, two per node.
- Palmate leaf or veins** — A leaf whose veins, lobes, or leaflets radiate from a single point, like fingers from the palm of a hand.
- Petiole** — The stalk of the leaf, connecting the leaf blade to the stem.
- Pinnate leaf or veins** — A leaf whose veins, lobes, or leaflets radiate on opposite sides of a central axis in a featherlike fashion.
- Secondary leaf vein** — A vein branching from the main central vein (midvein).
- Serrate leaf** — A leaf with sawtoothed margins.
- Sessile** — Refers to a leaf, flower, or fruit that lacks a stalk and is attached directly to the stem.
- Simple leaf** — A leaf composed of a single, undivided blade.
- Veins** — The strands of transport tissue often seen as lines in leaves.
- Venation** — The arrangement of veins in a leaf, often described as parallel, pinnate, or palmate.
- Whorl** — A group of three or more leaves, floral parts, or flowers that are arranged in a ring around a central point.

Botanical Skills Workshop — Tree ID Flowchart

Matt Ritter, Winter 2013

never a bud inside
of a compound leaf

IDENTIFICATION FLOWCHART TO THE GENERA OF CALIFORNIA'S TREES



- 4. Leaf upper surface only slightly rough to the touch, tufts of hair only occasionally in lower surface vein axils; fruit margins hairy—American Elm (*Ulmus americana*)
- 4' Leaf upper surface very rough to the touch, tufts of hair always in lower surface vein axils; fruit margins hairless
- 5. Leaf base strongly lopsided, one side sometimes covering the petiole, seed in the center of the samara, leaves with 16 to 20 pairs of veins—Scotch Elm (*Ulmus glabra*)
- 5' Leaf base lopsided but not strongly so, petiole not covered, seed toward the tip of the samara, leaves with 8 to 18 pairs of veins—English Elm (*Ulmus minor*, synonym = *Ulmus procera*)

Key to Commonly Cultivated Pines

- 1. Needles 2 per bundle
 - 2. Needles mostly less than 3 in. long
 - 3. Cones on short stalks, foliage bluish green, often a large garden tree—Scotch Pine (*Pinus sylvestris*)
 - 3' Cones not stalked, foliage dark green, often a small container or rock garden tree—Mugho Pine (*Pinus mugo*)
 - 2' Needles mostly 3 in. long or more
 - 4. Seed wing shorter than seed, tree crown rounded—Italian Stone Pine (*Pinus pinea*)
 - 4' Seed wing longer than seed, tree shape varying
 - 5. Cones falling from tree at maturity (old cones not found on branches)
 - 6. Twigs glaucous - Japanese Red Pine (*Pinus densiflora*)
 - 6' Twigs not glaucous - Japanese Black Pine (*Pinus thunbergii*)
 - 5' Cones persisting on tree for many years (old branches with many cones)
 - 7. Cone scale rounded, without a prickle—Aleppo Pine (*Pinus halepensis*)
 - 7' Cone scale with a small prickle—Monterey Pine (*Pinus radiata*)
- 1' Needles more than 2 per bundle
 - 8. Needles 5 per bundle—Torrey Pine (*Pinus torreyana*)
 - 8' Needles 3 per bundle
 - 9. Needles mostly 6 in. long or more
 - 10. Foliage clearly drooping, cone scale with a sharp prickle—Jelecote Pine (*Pinus patula*)
 - 10' Foliage slightly drooping, cone scale with a blunt prickle—Canary Island Pine (*Pinus canariensis*)
 - 9' Needles mostly less than 6 in. long
 - 11. Cone scale rounded, without a prickle—Aleppo Pine (*Pinus halepensis*)
 - 11' Cone scale with a small prickle—Monterey Pine (*Pinus radiata*)

Key to Commonly Cultivated Araucaria

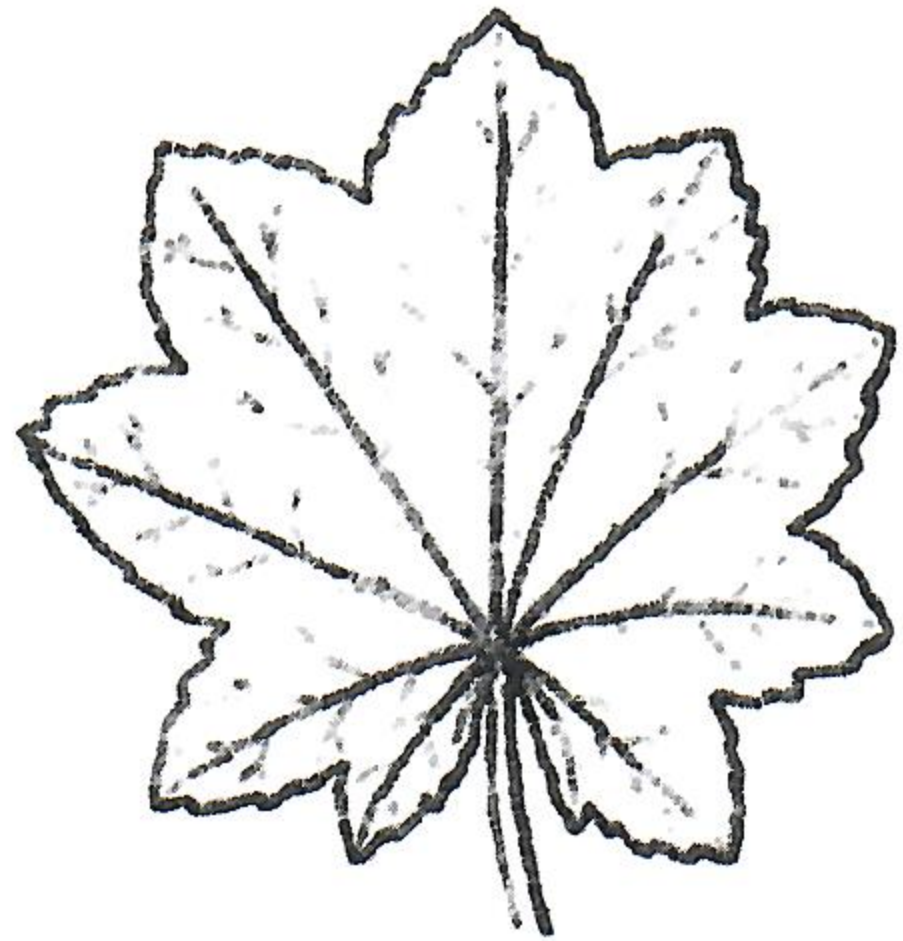
- 1. Leaves 3/4 in. long or longer
 - 2. Leaves spreading, often arranged in two rows, narrowing at the base, stiff but flexible— Bunya Bunya (*Araucaria bidwillii*)
 - 2' Leaves strongly overlapping, often spirally arranged, barely narrowing at the base, stiff and rigid— Monkey Puzzle (*Araucaria araucana*)
- 1' Leaves 1/2 in. long or shorter
 - 3. Crown of mature tree rounded, upper branches arching upward, foliage in dense tufts at ends of branches—Hoop Pine (*Araucaria cunninghamii*)
 - 3' Crown of mature tree pointed, upper branches angled, foliage distributed throughout length of branches
 - 4. Mature tree columnar, often leaning—Cook Pine (*Araucaria columnaris*)
 - 4' Mature tree conical, not leaning—Norfolk Island Pine (*Araucaria heterophylla*)

Palmate

Palmately veined

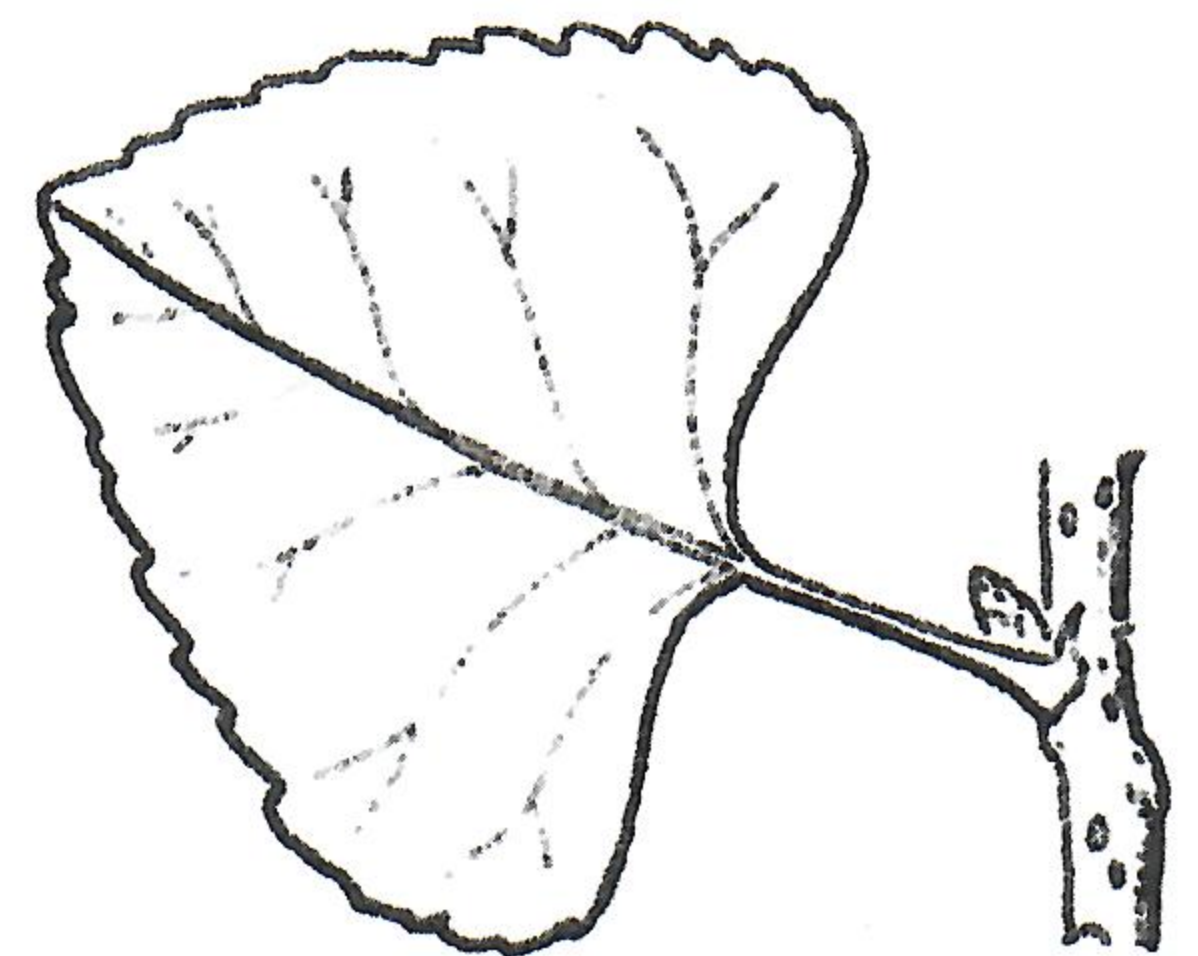
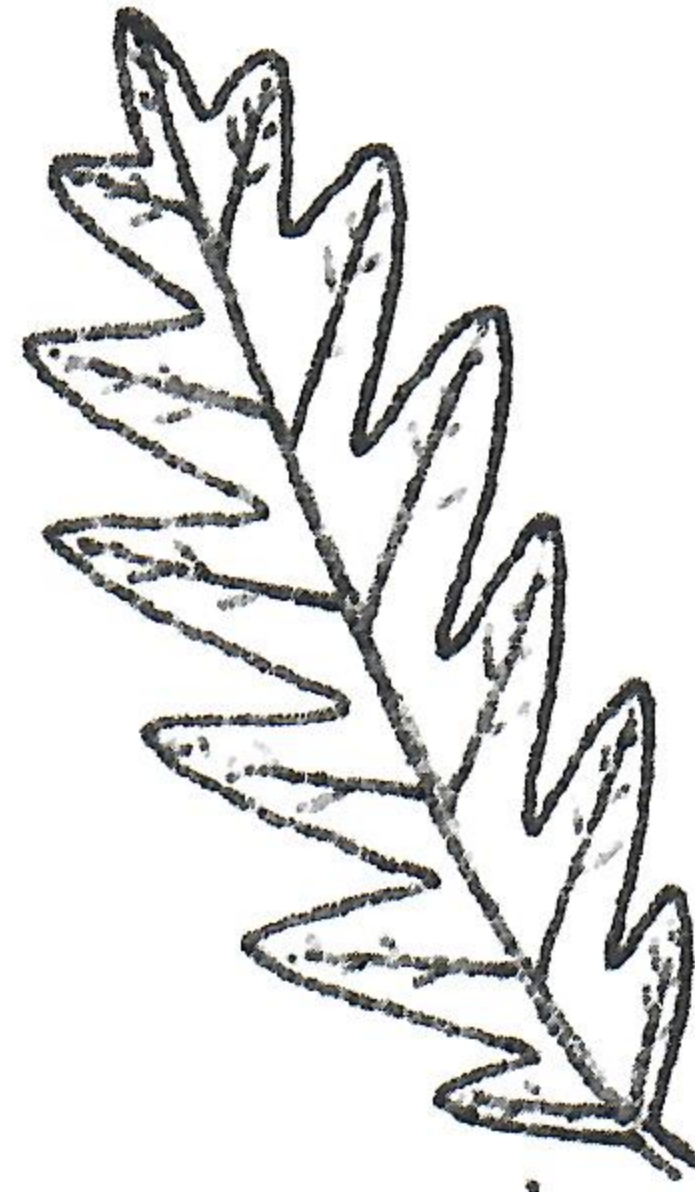
Simple

Leaf



Pinnate

Pinnately veined



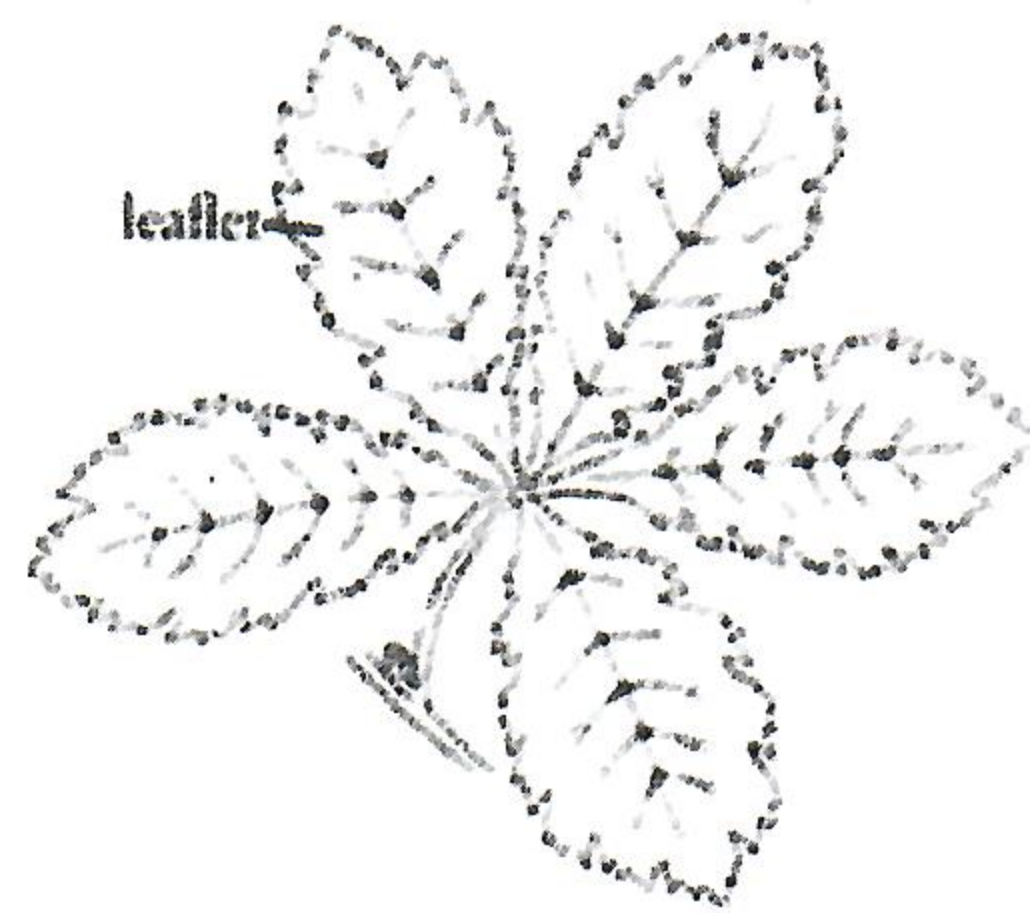
going on stem like structures

an ant can walk all the way around w/out

Compound

Leaf

Palmately compound



leaflet

Pinnately compound

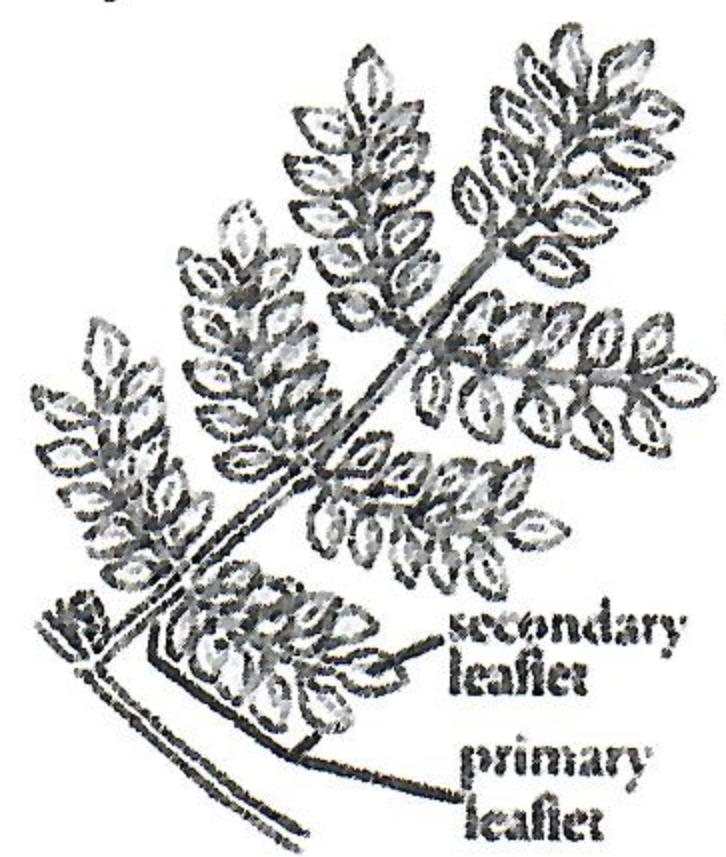
Pinnate



leaflet

fancy

Bipinnate

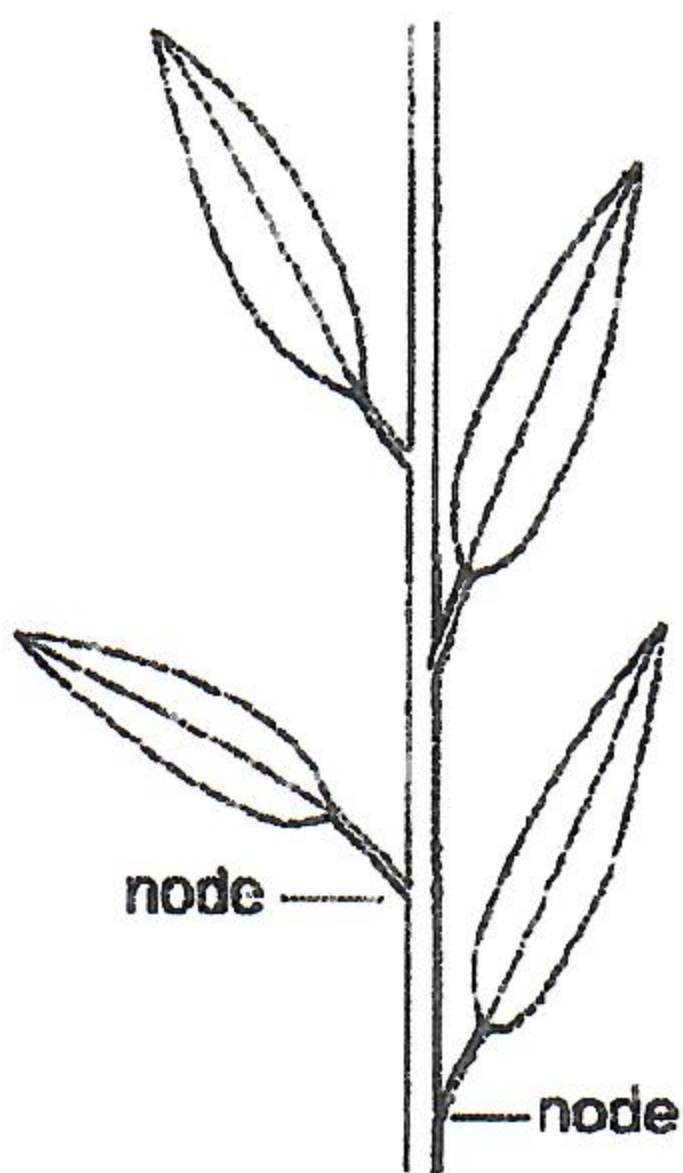


secondary leaflet
primary leaflet

extra fancy

Leaf Arrangement

Leaf Margin

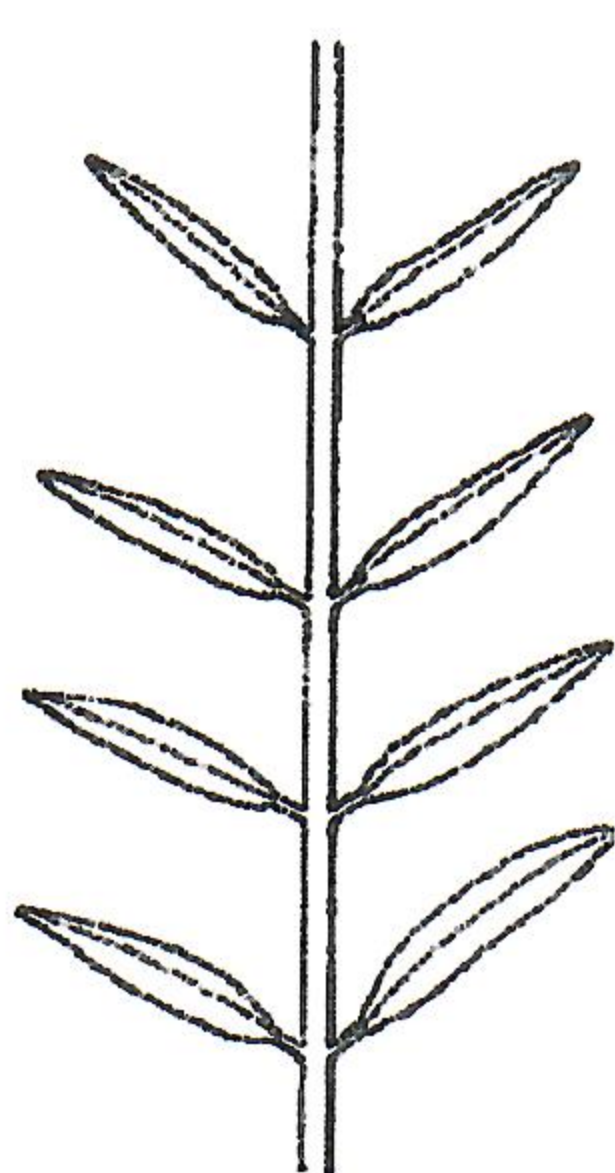


node

node

alternate

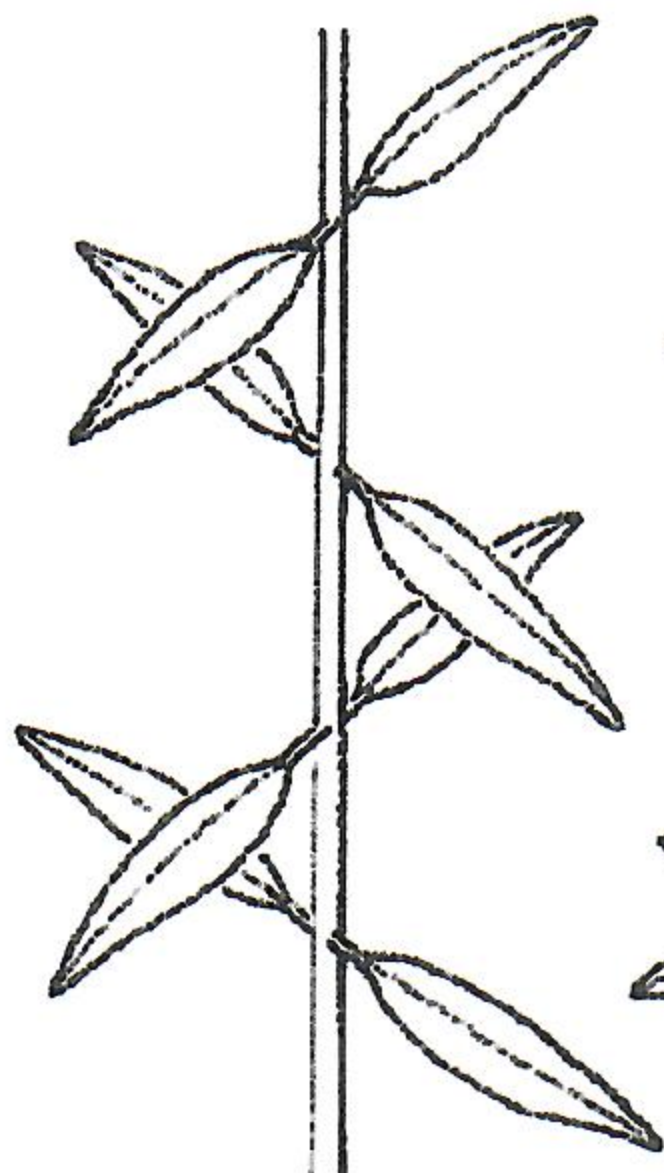
1 leaf per node



opposite

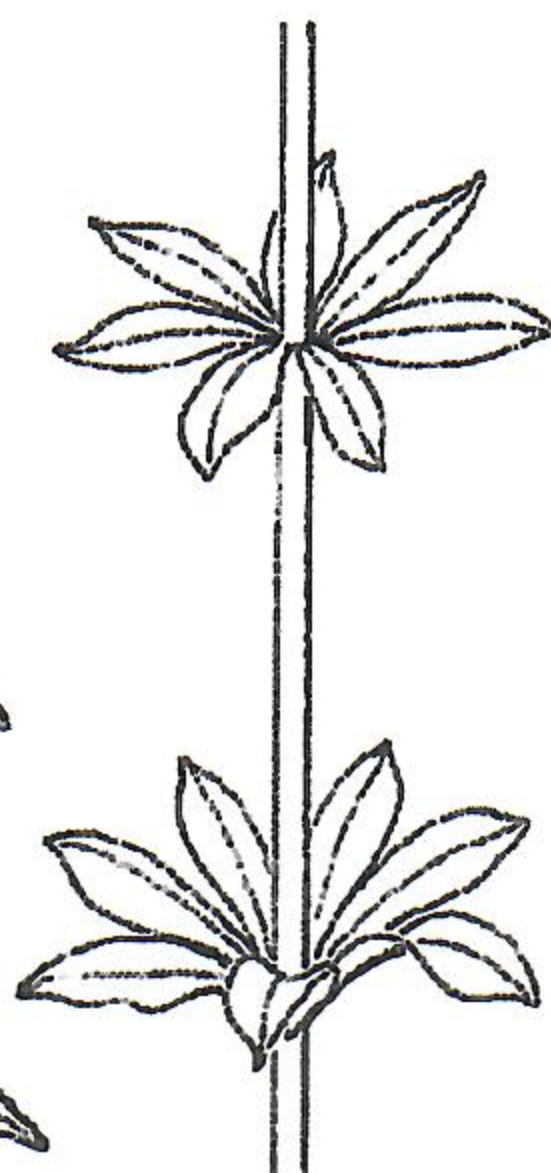
leaves 2-ranked

2 leaves/node



opposite

leaves 4-ranked

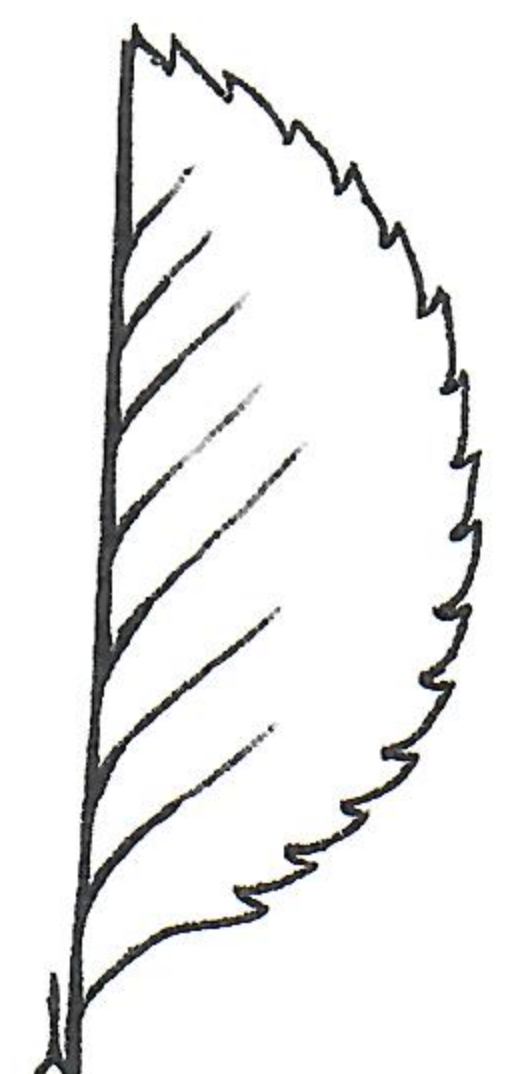


whorled

3 leaves/node



entire



serrate

neither a ... of ...