CONIFER WALK – BIOLOGY 210

A) CONIFER FAMILIES

1. Pinaceae
   - Pollen saccate with 2 wings
   - Cone scale and bract separate
   - Leaves needle-like, spirally arranged
   - monoecious

Genera: *Pinus, Picea, Abies, Tsuga, Larix, Pseudotsuga, Cedrus*

2. Cupressaceae
   - pollen small, with a pore, no wings
   - cone scale and bract fused or almost fused
   - leaves scale-like or linear, opposite, spiral, whorled, or decussate
   - monoecious (or dioecious)

Genera: *Juniperus, Chamaecyparis, Thuja, Libocedrus, Platycladus, Xanthocyparis*
Genera formerly Taxodiaceae: *Sequoia, Sequoiadendron, Taxodium, Metasequoia, Cunninghamia, Cryptomeria*

3. Araucariaceae
   - pollen large, no wings
   - cone scale and bract fused
   - leaves linear-broad, opposite or spiral
   - monoecious or dioecious

Genera: *Araucaria*

4. Sciadopitaceae
   - pollen cones clustered at tip of branches
   - cone scale almost enclosing bract
   - "leaves" long (up to 12 cm), flat, and leathery in whorls (also has small scale leaves)
   - monoecious

Species: *Sciadopitys verticillata*

5. Taxaceae
   - pollen round, no wings
   - no seed cone, instead a single terminal ovule within an aril
   - leaves linear or needle-like, spiral
   - dioecious

Genera: *Taxus*

6. Cephalotaxaceae
   - pollen sac 3, wingless
   - "cone" comprised of a few decussate pairs of scales, each of which has two ovules, one fertilized ovule of the "cone" matures to form a stalked drupe-like seed which has a fleshy outside layer
   - leaves linear-lanceolate, spiral, in 2 ranks
   - dioecious

Genera: *Cephalotaxus*

B) CONIFER SPECIES

1. *Pinus ponderosa* – Pinaceae
   - 'Ponderosa Pine', native to dry interior of western North America
   - can get very large, high quality lumber
   - the bark on this tree is not typical, usually it is more reddish and cracked into plates
   - female cones with prickles
   - needles in bunches of threes (sometimes 2 – 5), very long, it is the only 3-needled pine in BC

2. *Chamaecyparis lawsoniana* – Cupressaceae
   - 'Port Orford Cedar', native to southwestern Oregon, California
   - small round female cones, bracts and scales completely fused (line across centre, 3 seeds per cone scale, 2 wings per seed)
   - one year for female cone to mature (usually open in the fall)
   - male cones are red
   - leaves are decussate (in opposite pairs)
   - frequently cultivated, numerous varieties

3. *Chamaecyparis nootkatensis* – Cupressaceae
   - recently renamed to Xanthocyparis nootkatensis because of its similarity (molecular) to *Xanthocyparis vietnamensis* (discovered in 2001)
   - 'Yellow Cedar' or 'Cypress', native to coastal BC, Washington, Oregon, and Alaska
   - female cone with scale and bract fused, cone scale peltate and in opposite pairs

4. *Thuja plicata* – Cupressaceae
   - 'Western Red Cedar', native to western North America, one of the largest trees in this area and one of the oldest. Used where rot resistance is important (shingles, fences, etc.)
   - foliage decussate (in opposite pairs as in *Chamaecyparis*)
   - female cones are more elongate than in *Chamaecyparis*, scale and bract fused except at the very tip of the bract, spirally arranged

5. *Pseudotsuga menziesii* – Pinaceae
   - 'Douglas Fir', native and largest tree of Canada (150-200 feet tall and 3-6 feet in diameter), it is a major construction timber
   - female cone has a three point bract, large scales with 2 seeds, the impression of the seeds remain on the scale
   - there are cracks in the periderm, the bark grows in to cover cut branches

6. *Picea sitchensis* – Pinaceae
   - 'Sitka Spruce', found along the west coast of North America
   - seldom inland more than 50 miles from coast, grows in river deltas and along sea shore in habitats with high calcium and magnesium
   - used for pulp
   - needles arranged all around the branch
   - female cone with crenulate edge to cone scales, obvious bracts

7. *Tsuga heteorphylla* – Pinaceae
    - 'Western Hemlock', found from Alaska to California and Idaho, grows very large, important lumber tree
    - leaves are small, more or less two-ranked, white stripes down the back of the needles, like other hemlocks the leaves are attached by tiny, thread-like process to woody projections on the twig (this is unlike any other native sp.)
    - female cones are present from last year
    - male cones occur late in summer, no bladder on pollen grain

8. *Metasequoia glyptostroboides* – Taxodiaceae (now Cupressaceae)
    - 'Dawn Redwood', native to China
    - was first described as fossil material, it was the most abundant conifer in western North America up to about 25 million years ago, the first living specimen was found in China in 1944
    - female cones at the top of the tree, set cones very early, fused scale and bract, rounded female cones with seeds
    - hardy and easily cultivated from seed
    - the soft pale green leaves are borne on opposite pairs of deciduous branchlets, turn bronze in autumn

9. *Cryptomeria japonica* – Taxodiaceae (now Cupressaceae)
    - 'Japanese Cedar', native to Japan and China. Main timber tree of Japan for house lumber
    - leaves spirally arranged, similar to early conifer leaves (awl-shaped)
    - branches are spiral (pseudo-whorled)
    - female cones are rounded, cone scale and bract partially fused, seeds tiny and winged (4 – 5 per scale/bract complex)
    - male cones mature earlier than female, pollen grains bladderless

10. *Cunninghamia lanceolata* – Taxodiaceae (now Cupressaceae)
    - 'Chinese Fir', native to central and south China, generally used for timber, wood is light, fragrant, and durable
    - female cones have fused bracts, very young cones are present
    - male cones, this year's and last year's, are present in clusters, note that the bract grows out through male cone clusters so that there is a year's growth between each year's cones
    - whole twigs dehisce, rather than individual needles

11. *Sequoiadendron giganteum* – Taxodiaceae (now Cupressaceae)
    - 'Giant Redwood', grows only in groves on the western slope of the Sierra Nevada Mountains in California
    - shade intolerant
    - spiral leaves and cone scales
    - small winged seeds
    - male cones present in February

12. *Cephalotaxus harringtonia* – Cephalotaxaceae
    - 'Cow's Tail Pine' or 'Plum Yew', native to central China and Japan
    - it is similar in appearance to yew, the seed however is entirely enclosed in its fleshy covering, unlike the yew which has its seed partially exposed in the aril
    - like yew it is dioecious
    - this is a widely cultivated species

13. *Sciadopitys verticillata* – Sciadopitaceae (formerly Taxodiaceae, **never** Pinaceae)
    - 'Japanese Umbrella Pine', endemic to central Japan
    - only species in the family
    - male cones
    - two kinds of "needles"
    - in lab students saw asterosclereids in needles

14. *Araucaria araucana* – Araucariaceae
    - 'Monkey Puzzle', native to Argentina and Chile
    - it is closely related to Norfolk Pine (*Araucaria heterophylla)*
    - this is a male tree, the sexes are separate
    - whorled leaves and branches, the leaves are persistent lasting many years

15. *Larix occidentalis* – Pinaceae
    - 'Western Larch', one of three larches native to BC found in the mountains east of Cascade Mountains and south to Oregon
    - it is not cultivated as much as the other larches

16. *Taxus* sp.
    - 'Yew'
    - there are 8 known species of yew, two of which are native to Canada, *T. brevifolia* and *T. Canadensis*
    - dioecious (separate sexes) these ones are males