

Conifers of Idaho

Students of Idaho botany are fortunate in having a high diversity of native cone-bearing plants available for study and enjoyment. This exercise is intended to acquaint you with the more common members of this fascinating and economically important group of plants.

The following is a list of conifers occurring naturally in Idaho.

<i>*Taxus brevifolia</i>	western yew
<i>*Abies grandis</i>	grand fir, (white fir)
<i>Abies concolor</i>	concolor fir, white fir
<i>Abies lasiocarpa</i>	subalpine fir
<i>*Larix occidentalis</i>	western larch, tamarack
<i>L. lyallii</i>	alpine larch
<i>*Picea engelmannii</i>	Engelmann spruce
<i>Picea pungens</i>	blue spruce
<i>Pinus albicaulis</i>	whitebark pine
<i>Pinus flexilis</i>	limber pine
<i>*Pinus contorta</i>	lodgepole pine, shore pine, scrub pine
<i>*Pinus monticola</i>	western white pine
<i>*Pinus ponderosa</i>	ponderosa pine, western yellow pine, bull pine
<i>P. monophylla</i>	single-leaf pinyon pine
<i>*Pseudotsuga menziesii</i>	Douglas fir
<i>*Tsuga heterophylla</i>	western or lowland hemlock
<i>Tsuga mertensiana</i>	mountain hemlock
<i>*Thuja plicata</i>	western red cedar
<i>Juniperus</i> sp.	juniper

The 19 species above are distributed among three families; the Pinaceae, Taxaceae, and Cupressaceae.

Two of the conifers on the preceding page have scale-like leaves as contrasted with needle-like leaves.

These two genera are _____ and _____

Both are members of the **Cupressaceae** or cypress family.

One of these genera has rounded twigs and globose cones that are fleshy and often bluish. This genus is _____.

The species in Cupressaceae, common in north Idaho, has flattened twigs and elongate, dry cones that are not at all fleshy. This genus is _____.

One conifer has needles that are 2-ranked (needles in one plane) with a short spine at the apex of each needle. The needles are medium to dark green above and pale green beneath. If cones are available, there is no mistaking this unique plant, for the female

cones resemble a red berry. The name of this conifer is _____.

It is a member of **Taxaceae** and is the only representative of this family in our flora. The wood was often used for the construction of bows, and the bark contains the powerful anti-cancer agent "taxol".

The remaining conifers are all members of the **Pinaceae** or pine family. The family is characterized by having comparatively large, dry cones, the leaves needle-like rather than scale-like, and borne in clusters or fascicles of 1-5, 20-50 at the ends of short spur shoots, or borne singly.

The conifer that has its needles in tufts of 20-50 at the ends of short spur shoots is

_____. This tree is a member of a genus that sheds its needles each fall. Coloration of these leaves in the fall, which is brilliant yellow, can be a spectacular sight.

Five conifers have their needles in fascicles of 2-5. These are members of the genus

_____. Considering these five only:

needles 2 per bundle: _____

Cones are small, lop-sided with sharp spines

needles 3 per bundle: _____

Cones are larger, symmetrical, with generally down-curving spines

There are three pines have their needles in bundles of 5. Only one occurs in our area, the state tree of Idaho. The needles slender, up to 10 cm in length, the margins often serrulate (with fine

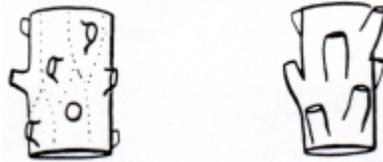
teeth) _____

Cones are relatively long with has thin scales that lack spines.

The other two five-needles pines have needles shorter and stouter than above, the margins smooth rather than finely roughened. They are: ***Pinus albicaulis*** and ***Pinus flexilis***

It is nearly impossible to tell the difference between these two species by leaf characteristics. They both grow at high elevations in the mountains of Idaho. These two species can be distinguished by smell supposedly. *Pinus albicaulis* branches have a rather sweet odor while the branches of *Pinus flexilis* have the odor of turpentine.

Of the remaining conifers, four have leaf bases that are woody, peg-like, and are raised conspicuously above the surface of the twig. When the leaves of these are shed (and this happens rather quickly after cutting), there remains on the branch a series of “pegs” making the branch rough to the touch. The easiest way to find these specimens is to look for missing needles. If you can see a very definite peg where there once was a needle, then you have found one of the four. If, however, you find only a circular or elliptic scar that is nearly flush with the surface, continue your search. Remember there should be four samples that have these “pegs”. The illustration below may be of some help. They illustrate two kinds of peg-like leaf bases.



One genus has pegs that project from the twig at nearly right angles, and

has needles that are generally very stiff and sharp. They also have very papery cones. This

genus is _____.

Considering these two species of the genus only:

young twigs pubescent (hairy) _____
Cones less than 6 cm long

young twigs glabrous (bald) ***Piceae pungens***
Cones more than 6 cm long

The other genus that has peg-like scars has these pegs projecting forward toward the tip of the stem, and needles that are not nearly as stiff or sharp pointed. It can also be distinguished by its drooping leader. This second genus with peg-like scars is _____.

The two species of this genus are easily separable on the basis of leaf features alone.

Considering these two only:

-needles of very different length on the same stem, dark green above, grayish below (stomata only on the lower surface) and essentially 2-ranked. (Cones small)

-needles of about the same length, upper and lower surface of about the same color (stomata on all surfaces), radially arranged along the stem and generally somewhat thicker than above. This is a higher elevation species. (Cones larger) ***Tsuga mertensiana***

The last two genera may be separated by a number of characters, including leaf scars. One genus has leaf scars that contain a small crater in the center of the scar. The other genus lacks this feature. Examine your specimens carefully, looking for areas on the stem that have lost needles. Your dissecting scope or a hand lens is helpful at this point. Match the drawings below with the leaf scars of your specimens.



Do not be discouraged if you cannot discern this difference, for there are easier methods of separating these two genera.

Considering these two genera again, genus "A" has terminal buds that are sharp pointed, while genus "B" has terminal buds that are rounded.

Genus "A" is _____

Genus "B" is _____

Pseudotsuga is often confused with some of the true firs (*Abies*) but can be distinguished readily on the basis of the terminal buds. The true firs (*Abies*) generally have a branching pattern that could be called "regularly opposite". Most specimens of *Pseudotsuga* have branching that is not regularly opposite. The cones of "Doug fir" are very distinctive with three pointed bracts that extend beyond the scale.

The conifer, then, that has leaf scars without the crater, sharp-pointed buds, and a pattern of branching that is not strictly opposite is _____

The three remaining conifers are members of the genus *Abies*, the true firs. These are attractive trees, some of which are often used as ornamentals. The cones of the genus *Abies* are of interest for they are not often seen intact. The scales are deciduous while the cone is attached to the tree, and unless the squirrels have been active, you will seldom see fir cones on the forest floor. The cones are of additional interest for they are borne upright on the branches (generally the upper branches). None of the other members of the Pinaceae (in our flora) has upright cones.

The species of true firs are often easily identifiable on the basis of leaf characteristics alone.

Needles 2-ranked, stomata only on the lower surface _____

Needles radially arranged, stomata on both leaf surfaces (this includes both remaining firs)

Of these two firs, one has resin ducts (as seen in a cross section of the needle) that are small and close to the lower epidermis. This species is native in southeast Idaho but a common "Christmas tree". The leaves are very bluish ***Abies concolor***.

The other *Abies* has relatively large resin ducts located midway between the upper and lower epidermis. These large resin ducts can often be seen without the aid of a lens simply by breaking the needle. The last species, growing at higher elevations, a beautiful tree, narrow and conical is subalpine fir ***Abies subcaulis***