Pinophyta - Gymnosperms
Pinophyta - Gymnosperms

Seed bearing plants without flowers and pistils - “naked seeds”

Gymnasion =

“naked house”
Pinophyta - Gymnosperms

Seed bearing plants without flowers and pistils - “naked seeds”
4 major groups recognized; sometimes as separate phyla

3 families of conifers only in Great Lakes region with 8 genera and 13 species
- Cupressaceae - junipers
- Pinaceae - pines, spruces
- Taxaceae - yews
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General characteristics:

• Less diverse than ferns: 12 families, 80 genera, 820 species
• Woody: trees, shrubs, lianas, few epiphytes
• Worldwide, but more dominant in colder and arctic regions
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General characteristics:

- **Seeds!**

- = mature **ovule**

- “naked seed” in cone

- No water required for sperm movement - **pollen**

- = male gametophyte (**heterosporous**!)

- pollinated by wind (mostly)
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Good books!
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Cupressaceae: cypress family

Leaves needle or scale-like
Opposite or whorled, persistent
Important rot resistant trees (redwood, cedar)

Thuja occidentalis
Arbor vitae, White cedar

Leaves opposite in 4 ranks and heteromorphic
Branches flattened
Small woody cones
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Cupressaceae: cypress family

Leaves needle or scale-like
Opposite or whorled, persistent
Important rot resistant trees (redwood, cedar)

*Juniperus*
Junipers, Red cedar

Leaves closely appressed; can be scale-like or awl-like

Branches not flattened

Blue “berry” cones
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Cupressaceae: cypress family

*Juniperus virginiana*
Red cedar

*Juniperus communis*
Common juniper

*Juniperus horizontalis*
Creeping juniper
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Taxaceae: yew family

Leaves needle-like, spreading in one plane - 2 ranked
No cones, single seed in fleshy aril, but seeds naked
1 genus *Taxus*; taxol drug from western *T. brevifolia*

*Taxus canadensis*
American yew
Ground hemlock

Apostle Islands stand with no deer
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**Taxaceae: yew family**

Leaves needle-like, spreading in one plane - 2 ranked
No cones, single seed in fleshy aril, but seeds naked
1 genus *Taxus*; taxol drug from western *T. brevifolia*

*Taxus cuspidata*
Japanese yew
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Pinaceae: pine family
6 genera, 200 species of Northern Hemisphere
Foliage leaves needle-like, alternate or fascicled
Many seeds enclosed in fleshy to woody cone, with
conspicuous cone scales

*Pinus strobus*
White pine

Alleghenian element
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Pinaceae: pine family

*Pinus resinosa* Red pine
- more xeric than white pine
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Pinaceae: pine family

*Pinus banksiana* - Jack pine
- most xerix of the pines
- showing serotinous cones
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Pinaceae: pine family

*Pinus banksiana* - Jack pine

- **Keystone species** involving glacial geology, jack pine bud worm, defoliation, fire, serotinous cones, endangered Kirtland’s warbler, and parasitic cowbird
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Pinaceae: pine family

7 year old jack pine site – Crawford Co. MI

“sand counties” due to glacial melt off
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**Pinaceae: pine family**

Endangered Kirtland’s Warbler basically restricted to these sand counties in MI and to young stands of jack pine

Jack pine bud worm infestations allow fire and cyclical formation of new stands of jack pine
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Pinaceae: pine family

Parasitic cowbird (and suppression of fire) almost caused the Kirthland’s warbler go extinct
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Pinaceae: pine family

**Abies balsamea**  
Balsam fir

**Larix laricina**  
Larch, tamarack
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Pinaceae: pine family

*Picea mariana*  
Black spruce

*Picea glauca*  
White spruce

*Tsuga canadensis*  
Eastern hemlock