

# ARNOLDIA



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## SIMPLE KEY TO THE PINES

(Native or available from nurseries in the United States)

**T**HIS simple key is offered chiefly for the benefit of the amateur gardener who is frequently confronted with keys which he finds unnecessarily complicated. The key is based primarily on foliage characters which, in most cases, can be observed without the use of a hand lens. It should be clearly understood that any key based primarily on the length of the leaves (and this key is just that) is open to serious criticism because the length of the leaves of any plant will vary with the individual as well as with soil, age and climate variations, disease infestations and altitude at which the tree is growing. Other plant characters vary likewise. However, in order to assist the gardener who has an interest in pines, this key is offered in spite of just such criticism. It includes only those pines which one is likely to find in the woods or nurseries of this country. A few native species have been omitted because they occur only in limited areas, and many exotic species are omitted because they have not yet been widely distributed in cultivation. It goes without saying that the more species included in a key, the more complicated that key becomes.

There are about 80 species of pines distributed throughout the northern hemisphere, 27 of which are growing in the Arnold Arboretum. This key includes all but four of the species native to the United States, as well as 15 exotic ones available from nurseries, all in all, 38 species of pines.

All measures of leaf length should be considered as approximate only. On one individual tree needles may vary in length from 2 inches to as much as 8 inches, but in the key the length given would be 4 to 6 inches, meaning that *mature* needles — not the young ones which are elongating, nor the ones on weak or on over-vigorous branches — are mostly within the 4 to 6 inch length. If this is clearly understood by those using this key, the key will undoubtedly prove helpful in the identification of most of our commonly grown pines.

The key is designed to be used chiefly with living material, hence the color of the foliage and the general habit of the tree sometimes plays an important part. Occasionally, as in differentiating between *Pinus strobus* and *P. monticola*, the two species are so much alike that cone characters are used, but these are resorted to only when absolutely necessary, for many a tree which one would like to identify is not graced with cones at the time one wishes to identify it.

This key can be greatly simplified for there are not many pines which are commonly found in any one area in the United States. As an example, let us consider the five-needled pines. There are at least 15 five-needled pine species of which 11 are growing in the Arnold Arboretum. Thirteen species and 3 varieties are listed in the following key. If this key were designed merely to identify the five-needled pines native to this country, the list would be reduced to 7 species. If the key were to be used in identifying the five-needled pines native in the northeastern United States only, this part dealing with five-needled pines would include merely *P. strobus*.

Hardiness is given according to Zones in the Hardiness Map published in former issues of *Arnoldia* (Vol. 3, No. 10, p. 53, 1943). Habitats are also given, because sometimes such information may prove helpful in assisting in plant identification.

There is no excuse for avoiding a simple key such as this one, merely because of a lack of thorough botanical training. Such keys, when carefully made, are understandable, and if they are used with a full knowledge of their limitations, they will prove most helpful to the gardening public. Identifications made by the use of any key, and this one in particular, should not be considered final, but should be further checked against a complete description in some standard text, and available illustrations.

### SIMPLE KEY TO THE PINES Native or available in North America

Needles in bundles of 2 to 5, rarely solitary, enclosed at the base by a deciduous or persistent sheath . . . . . **Pinus**

1. **Needles 5 in a sheath**

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|--|--|
| <p><i>albicaulis</i>—White Bark Pine<br/> <i>aristata</i>—Bristle-cone Pine<br/> <i>cembra</i>—Swiss Stone Pine<br/> <i>flexilis</i>—Limber Pine<br/> <i>griffithi</i>—Himalayan Pine<br/> <i>koraiensis</i>—Korean Pine<br/> <i>lambertiana</i>—Sugar Pine<br/> <i>monticola</i>—Western White Pine</p> | <p><i>parviflora</i>—Japanese White Pine<br/> <i>parviflora glauca</i><br/> <i>peuce</i>—Balkan Pine<br/> <i>pumila</i>—Japanese Stone Pine<br/> <i>strobus</i>—Eastern White Pine<br/> <i>strobus fastigiata</i><br/> <i>strobus nana</i><br/> <i>torreyana</i>—Torrey Pine</p> |
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2. Needles usually less than 1½ inches long with smooth margin **P. aristata**  
(California to Colorado) Zone 5

2. Needles usually 1½ to 2 inches long

3. Bark of trunk brown to creamy white, needles rigid and stout, margin smooth . . . . . **P. albicaulis**  
(British Columbia to California) Zone 3
3. Bark of trunk black, needles more flexible
  4. Needles bluish green, often twisted, intensely white underneath, leaf margin finely serrulate, i.e., rough to the touch . . . . . **P. parviflora**  
(Japan) Zone 5
  4. Needles intensely bluish green . . . . . **P. parviflora glauca**
  4. Needles light green, not twisted
    5. Mature twigs glabrous, needles smooth . . . . . **P. flexilis**  
(Alberta to California) Zone 4
    5. Mature twigs pubescent; leaf margin finely serrulate, i.e., rough to the touch . . . . . **P. pumila**  
(Japan) Zone 3
2. Needles mostly  $2\frac{1}{2}$  to  $4\frac{1}{2}$  inches long; leaf margin serrulate, i.e., rough to the touch
  3. Mature twigs glabrous
    4. Plant shrubby, not tree-like . . . . . **P. strobis nana**
    4. Branches upright, tree dense
      5. Needles stiff . . . . . **P. peuce**  
(Balkan Mts.) Zone 4
      5. Needles soft and flexible . . . . . **P. strobis fastigiata**
    4. Branches horizontal, tree more open
      5. Cones usually 2 to  $4\frac{3}{4}$  inches long; twigs glabrous or only slightly pubescent . . . . . **P. strobis**  
(Eastern U.S. and Canada) Zone 3
      5. Cones usually  $4\frac{3}{4}$  to 10 inches long; twigs pubescent when young (British Columbia to Idaho and California) Zone 5 **P. monticola**  
(These two species are difficult to tell apart with the naked eye, except that the habit of *P. monticola* is more narrow and dense and the needles stiffer than are those of *P. strobis*.)
  3. Mature twigs pubescent
    4. Tree densely upright, pyramidal in habit . . . . . **P. cembra**  
(Alps of Europe) Zone 4
    4. Tree not as above, more open
      5. Needles lustrous, dark green . . . . . **P. koraiensis**  
(Japan, Korea) Zone 3
      5. Needles dull green
        6. Terminal bud blunt almost globular, cones 12 to 20 inches (Oregon to California) Zone 5 **P. lambertiana**
        6. Terminal bud sharply pointed, definitely not globular, cones 4 to 10 inches . . . . . **P. monticola**  
(British Columbia to Idaho and California) Zone 5

- 2. Needles  $4\frac{1}{2}$  to 8 inches long . . . . . **P. griffithi**  
(Himalayas) Zone 5
- 2. Needles 8 to 12 inches long . . . . . **P. torreyana**  
(Southwestern California) Zone 9
- 1. Needles 3 to 4 only occasionally 5; leaf margin smooth  
**P. cembroides parryana**  
(California) Zone 9 Parry Pinyon Pine
- 1. Needles 3 in a sheath
  - attenuata*—Knob-cone Pine                      *ponderosa*—Ponderosa Pine
  - bungeana*—Lace-bark Pine                      *radiata*—Monterey Pine
  - canariensis*—Canary Pine                      *rigida*—Pitch Pine
  - coulteri*—Coulter Pine                          *sabiniana*—Digger Pine
  - jeffreyi*—Jeffrey Pine                          *taeda*—Loblolly Pine
  - palustris*—Longleaf Pine
- 2. Needles mostly 2 to 5 inches long
  - 3. Leaf sheaths deciduous, bark of older twigs smooth, bark of trunk flaky  
with white or yellow patches . . . . . **P. bungeana**  
(China) Zone 4
  - 3. Leaf sheaths not deciduous, bark of older twigs very rough, bark of  
trunk dark brown to black
    - 4. Foliage dark green, cones usually 2 to 4 inches long                      **P. rigida**  
(Eastern U.S. and Canada) Zone 4
    - 4. Foliage bright or bluish green; cones 3 to 7 inches long
      - 5. Bark on upper part of trunk and branches smooth                      **P. attenuata**  
(Oregon to California) Zone 8
      - 5. Bark on upper part of trunk and branches rough                      **P. radiata**  
(Southern California) Zone 8
- 2. Needles mostly 5 to 10 inches long
  - 3. Winter buds resinous
    - 4. Twigs fragrant when broken; cones 3 to 6 inches; foliage dark green,  
branchlets orange brown . . . . . **P. ponderosa**  
(Eastern and Central U.S.) Zone 5
    - 4. Twigs not fragrant when broken; cones 9 to 14 inches; foliage bluish  
green . . . . . **P. coulteri**  
(California) Zone 8
  - 3. Winter buds not resinous
    - 4. Foliage bluish green
      - 5. Needles stout, bark cinnamon red, cones 6 to 12 inches                      **P. jeffreyi**  
(Oregon and California) Zone 5
      - 5. Needles slim, bark red brown, cones 3 to 6 inches                      **P. taeda**  
(New Jersey to Florida and Texas) Zone 6



PLATE XV

4. Foliage dark green; cones 5 to 12 inches . . . . . **P. coulteri**  
(California) Zone 8
2. Needles 8 to 18 inches long
3. Foliage gray bluish green
4. Needles slender, drooping . . . . . **P. sabiniana**  
(California) Zone 6
4. Needles stiff, erect . . . . . **P. coulteri**  
(California) Zone 8
3. Foliage green
4. Needles mostly 8 to 10 inches long, light green and lustrous  
(Canary Islands) Zone 10 ? **P. canariensis**
4. Needles mostly 12 inches or more long, dark green **P. palustris**  
(Southeastern U.S.) Zone 7
1. **Needles 3 and 2 in a sheath**
- caribaea*—Slash Pine
- \* *cembroides*—Mexican Pinyon Pine
- echinata*—Shortleaf Pine
- ponderosa scopulorum*—Rocky Mountain Ponderosa Pine
- tabulaeformis*—Chinese Pine
2. Needles less than 2 inches long . . . . . **P. cembroides**  
(Southern California and Arizona) Zone 9
2. Needles more than 2 inches long
3. One year twigs greenish to purplish, covered with glaucous bloom  
(Eastern U.S.) Zone 5 **P. echinata**
3. One year twigs yellow brown to brownish
4. Terminal bud very resinous . . . . . **P. ponderosa scopulorum**  
(Rocky Mountain Region) Zone 4
4. Terminal bud not resinous or only slightly so
5. Needles 2 to 7 inches long; cones 1½ to 2 inches long  
(China) Zone 5 **P. tubulaeformis**
5. Needles 8 to 12 inches long; cones 3 to 6½ inches long **P. caribaea**  
(Southeastern U.S., Bahamas, Honduras) Zone 8
1. **Needles 2 in a sheath**
- banksiana*—Jack Pine
- densiflora*—Japanese Red Pine
- densiflora oculus-draconis*
- densiflora umbraculifera*
- echinata*—Shortleaf Pine
- mugo*—Swiss Mountain Pine
- mugo compacta*
- mugo pumilio*
- nigra austriaca*—Austrian Pine
- pinaster*—Cluster Pine
- pungens*—Table Mountain Pine
- resinosa*—Red Pine
- sylvestris*—Scotch Pine
- tabulaeformis*—Chinese Pine
- thunbergi*—Japanese Black Pine
- virginiana*—Virginia Pine
2. Needles ¾ to 3 inches long

- 3. Foliage with each needle marked with a yellow band  
**P. densiflora oculus-draconis**
- 3. Foliage bluish green, bark of upper trunk red **P. sylvestris and vars.**  
(Europe) Zone 2
- 3. Foliage green
  - 4. Plant usually shrubby, with several main branches from the base
    - 5. Needles  $\frac{3}{4}$  to 2 inches long, bark black . . . **P. mugo and vars.**  
(Central Europe) Zone 2
    - 6. Dense almost globose shape . . . . . **P. mugo compacta**
    - 6. Shrubby, upright habit . . . . . **P. mugo pumilio**
    - 5. Needles 3 to 5 inches, bark red to reddish  
**P. densiflora umbraculifera**
  - 4. Plant a tree with a central leader
    - 5. Needles mostly 1 inch long . . . . . **P. banksiana**  
(Northeastern U.S. and Eastern Canada) Zone 2
    - 5. Needles  $1\frac{1}{4}$  to 3 inches long
      - 6. Branchlets usually with glaucous bloom, often greenish to purplish or yellowish
      - 7. Foliage bluish green, cones usually not persistent, bark of upper trunk red; leaves flexible . . . . . **P. densiflora**  
(Japan) Zone 4
      - 7. Foliage bright green, cones persistent, bark of upper trunk black; leaves stiff . . . . . **P. virginiana**  
(Eastern U.S.) Zone 4
    - 6. Branchlets without glaucous bloom, orange to yellow
      - 7. Vigorous shoots often with more than one whorl of branches on the current year's growth . . . . . **P. pungens**  
(Southeastern U.S.) Zone 5
      - 7. Vigorous shoots with only one whorl of branches on the current year's growth
        - 8. Winter buds white or whitish to light yellow **P. thunbergi**  
(Japan) Zone 4
        - 8. Winter buds dark brown . . . . . **P. tabulaeformis**  
(China) Zone 5
- 2. Needles 3 to 8 inches long
  - 3. Winter buds resinous
    - 4. Needles slender and flexible, breaking when bent **P. resinosa**  
(Northeastern U.S. and Eastern Canada) Zone 2
    - 4. Needles stout and stiff, not breaking when bent **P. nigra austriaca**  
(Central Europe) Zone 4
  - 3. Winter buds not resinous (or only slightly so in *P. tabulaeformis*)

4. Buds stout, up to 1 inch long; branchlets bright reddish brown  
(Portugal to Greece) Zone 8 **P. pinaster**
4. Buds less than  $\frac{1}{2}$  inch long
5. Bark of upper trunk red . . . . . **P. densiflora**  
(Japan) Zone 4
5. Bark of upper trunk black
6. One year twigs with glaucous bloom, green to purplish **P. echinata**  
(Eastern U.S.) Zone 5
6. One year twigs without glaucous bloom, yellow to brown
7. Winter buds dark reddish brown . . . . . **P. tabulaeformis**  
(China) Zone 5
7. Winter buds light yellow to white or whitish **P. thunbergi**  
(Japan) Zone 4

DONALD WYMAN

#### EXPLANATION OF THE ILLUSTRATION

The picture (Plate XV, opp. page 66) of the trunk of the lace-bark pine (*Pinus bungeana*), made by Mr. Heman Howard of the Arnold Arboretum, was taken on the property of Mr. and Mrs. Roger Ernst, Brookline. This tree, now about 60 feet tall and nearly 30 feet in branch spread, is standing on what was formerly "Holm Lea" the original home of Professor Charles Sprague Sargent, first Director of the Arnold Arboretum. Since the first plants of this species came to the Arnold Arboretum in 1879 from the old Botanical Garden in Cambridge, Massachusetts, it is highly probable that this tree may have been planted in Brookline about that time.