



CONIFERS

Collecting notes

Cones usually need to be dried and kept separately from the pressed foliage, preferably in envelopes or bags as many disintegrate or shed seeds. Label these separately, with a cross reference, as they will be kept separate in a herbarium. Press side shoots plus a terminal shoot and bud, and photograph or describe bark and shape of crown. It is virtually impossible to prevent needles of *Picea*, etc., from falling during drying.

Key to taxa

Over most of our countryside, except in parts of Scotland, conifers are foreign introductions, much neglected by our botanists especially in County Floras. They are, however, an important part of our vegetation, particularly in their relationship to some of our birds and insects. In large gardens and arboreta are to be found a considerable proportion of the world's species. Naming these is a difficult problem. They should be covered by the account in S. M. Walters *et al.*, *The European Garden Flora vol. 1* (1986), but I find the keys inadequate and the illustrations do not help identification. The fourth edition of W. Dallimore and A. B. Jackson, *A Handbook of Coniferae and Ginkgoaceae*, revised by S. G. Harrison, contains much valuable information, but it is a large book difficult to find one's way about in. Perhaps the best book to use is A. Mitchell, *A Field Guide to the Trees of Britain and Northern Europe* ed. 2 (1978). Although some of the colour characters are difficult to understand and the information is sometimes rather disjointed, it gives the refreshing impression that the author is writing what he himself sees and is not copying from others who themselves have copied from one another. Arboriculturalists have selected and perpetuated many peculiar and often grotesque sports, some of which are mentioned by Mitchell and many superbly illustrated in D. M. van Geldersen and J. R. P. van Hoey Smith, *Conifers* (1986) and *Conifers: the illustrated encyclopaedia* 2 vols. (1996).

There are large numbers of conifers to be found in plantations, woodland, shelter belts, hedgerows, copses, parks, cemeteries and churchyards throughout our islands (a provisional checklist is given by C. Crook (1997) *BSBI News* 75: 42-47). They are found in important areas for conservation and should be properly recorded. The following key includes all those species I think are most likely to be found in these places. It can be used in conjunction with Mitchell (1978). It has been written after I have spent the winter looking at living specimens of many of the species. I have also consulted much literature. Nevertheless the key is still not entirely satisfactory and any improvements would be welcome.

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| 1 | Leaves all small and scale-like, usually more or less appressed to the twigs and shoots | 2 |
| 1 | At least some leaves needle-like, linear, acicular (needle or awl-like) or spine-like, scale-leaves rarely present as well | 11 |
| 2 | Twigs rounded or 4-sided, the scale-leaves even on all sides | 3 |
| 2 | Twigs flat, the facial scale-leaves usually flat, rarely keeled, the lateral scale-leaves keeled | 4 |

Plant Crib

Cupressus

- 3 Scale-leaves entire, obtuse at apex, without resin gland on back *Cupressus macrocarpa* Hartw. ex Gordon
3 Scale-leaves finely toothed, acute at apex, with a conspicuous gland on back exuding white resin *Cupressus glabra* Sudw

Chamaecyparis / Cupressocyparis

- 4 Young shoots only slightly flat, nearly 4-sided × *Cupressocyparis leylandii* (A. B. Jack. & Dallim.) Dallim. 5
4 Young shoots distinctly flat 5
5 Terminal shoot usually 'whip-like', drooping; cones globose, the peltate scales touching only at the margins 6
5 Terminal shoot erect; cones ovate to oblong, their scales overlapping 9
6 Scale-leaves without white markings on the lower surface, when crushed with a heavy unpleasant smell *Chamaecyparis nootkatensis* (D. Don) Spach
6 Scale-leaves with white or bluish markings on the under-surface, when crushed with a strong resinous aroma 7
7 Scale-leaves obtuse *Chamaecyparis obtusa* (Siebold & Zucc.) Endl.
7 Scale-leaves acute 8
8 Lateral scale-leaves keeled, overlapping the rhomboidal, smaller facial scale-leaves *Chamaecyparis lawsoniana* (A. Murray bis) Parl.
8 Lateral scale-leaves boat-shaped, the facial ones flat *Chamaecyparis pisifera* (Siebold & Zucc.) Siebold & Zucc.

Thuja

- 9 Foliage in vertical sprays, without scent when crushed; scale-leaves the same colour on both sides *Thuja orientalis* L.
9 Foliage spreading in flat sprays, aromatic when crushed; scale-leaves a different colour on lower sides from upper 10
10 Scale-leaves with conspicuous glands, yellowish- or bluish-green beneath, smelling of cooked apples with cloves when crushed *Thuja occidentalis* L.
10 Scale-leaves with inconspicuous glands with narrow streaks of greenish-white beneath, with a powerful aroma of apples or pineapple *Thuja plicata* D. Don
11 Leaves always solitary 12
11 Leaves in clusters 39
12 Leaves opposite or in whorls of 3 13
12 Leaves spirally arranged, some sometimes appearing to be in 2 rows 18
13 Leaves with distinct white stripes (stomatal bands) on the upper side 14
13 Leaves without distinct white stripes above 17

Juniperus

- 14 Leaves all acicular 15
14 Both acicular and scale-like leaves present 16

Plant Crib

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- 15 An erect or spreading bush; leaves 8-20 x c. 1 mm, apex gradually tapered to a long point; fruit globose *Juniperus communis* L. subsp. *communis*
- 15 A procumbent bush; leaves 4-10 x c. 1.5 mm, apex more suddenly contracted to a shorter point; fruit longer than broad *Juniperus communis* L. subsp. *nana* (Hook.) Syme
- 16 Scale-leaves obtuse *Juniperus chinensis* L.
- 16 Scale-leaves acute *Juniperus virginiana* L.
- 17 Leaves with whitish stripes beneath (juvenile forms of *Chamaecyparis*)
- 17 Leaves green on both sides (juvenile forms of *Thuja*)
- Araucaria***
- 18 Leaves ovate-triangular 25-30 mm long, stiff and prickly and covering the stem *Araucaria arucana* (Molina) K. Koch
- 18 Leaves not as above 19
- 19 Young shoots yellowish, brownish or reddish 20
- 19 Young shoots greenish 33
- 20 Leaves attached directly to the twigs, and when removed twig smooth 21
- 20 Leaves attached to a small projection and when removed twig rough 23
- Abies***
- 21 Leaves bluish-green on upper side with 4-6 rows of stomata; young shoots with short reddish hairs *Abies procera* Rehder
- 21 Leaves dark shining green on upper side and stomata usually absent; young shoots with short whitish or brownish hairs 22
- 22 Leaves 20-60 mm; buds resinous; cones 5-12 cm, bracts included *Abies grandis* (D. Don) Lindl.
- 22 Leaves 15-30 mm; buds not or only slightly resinous; cones 10-20 cm, bracts exerted *Abies alba* Mill.
- 23 Leaves without a petiole 24
- 23 Leaves with a distinct petiole 29
- Picea***
- 24 Leaves flat, with 2 bands of stomata only on the upper surface 25
- 24 Leaves tetragonal, with stomata on all 4 sides 26
- 25 Young shoots glabrous; leaves 15-25 mm, pungent (i.e. sharply pointed); cones 6-10 cm *Picea sitchensis* (Bong.) Carrière
- 25 Young shoots hairy; leaves 8-18 mm, obtuse and mucronulate; cones 3-6 cm *Picea omorika* (Panvic) Purk.
- 26 Leaves 6-10 mm, obtuse *Picea orientalis* (L.) Link
- 26 Leaves 10-25 mm, acute 27
- 27 Young shoots densely pubescent with short hairs; cones 6-8 cm. *Picea abies* (L.) H. Karst. subsp. *obovata* (Ledeb.) Hultén
- 27 Young shoots glabrous or with scattered minute hairs; cones 10-18 cm 28
- 28 Cone scales with a truncate and erose or emarginate apex *Picea abies* (L.) Karsten subsp. *abies* var. *abies*
- 28 Cone scales with an in-curved acumen at the apex *Picea abies* (L.) H. Karst. subsp. *abies* var. *acuminata* Beck
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Plant Crib

Tsuga / Pseudotsuga

- 29 Leaves 10-25 mm; petiole appressed to the shoot; buds small and rounded or shortly pointed 30
- 29 Leaves 20-35 mm; petiole at an oblique angle to the shoot; buds long and narrow, acuminate 31
- 30 Young shoots with long and short hairs intermixed; buds rounded at apex; leaves parallel-sided
Tsuga heterophylla (Raf.) Sarg.
- 30 Young shoots shaggy with long hairs; buds pointed at apex; leaves tapering towards the apex
Tsuga canadensis (L.) Carrière
- 31 Leaves with strong, sweet, resinous aroma when crushed, dark yellowish or medium green on upper surface; cones 7-10 x 2.5-4.5 cm, with 40-50 scales, bracts erect
Pseudotsuga menziesii (Mirbel) Franco subsp. *menziesii*
- 31 Leaves often smelling of turpentine when crushed, dark bluish- or greyish-green on upper surface; cones 4.5-8.0 x 2-3 cm, with up to 30 scales, bracts often prominently reflexed 32
- 32 Leaves not 2-ranked but all round the old twigs; cone bracts reflexed
Pseudotsuga menziesii subsp. *glaucescens* (Schwerin) P. D. Sell var. *glauca* (Beissn.) Franco
- 32 Leaves more or less 2-ranked on the old twigs, the upper rank forming a V-shaped furrow along the top of the twig; cone bracts erect
Pseudotsuga menziesii subsp. *glaucescens* var. *caesia* (Schwer.) Franco
- 33 Leaves with a petiole 34
- 33 Leaves sessile 36

Taxus baccata

- 34 Branchlets and twigs spreading *Taxus baccata* L. forma *baccata*
- 34 Branchlets and twigs hanging or erect 35
- 35 Branchlets and twigs erect *Taxus baccata* forma *fasciculata* (Lindl.) Pilger
- 35 Branchlets and twigs hanging *Taxus baccata* forma *dovastonii* (Carrière) Pilger

Sequoia / Sequoiadendron / Cryptomeria

- 36 Leaves dimorphic, those of side shoots linear to linear-oblong, flat, distichous
Sequoia sempervirens (D. Don ex Lamb.) Endl.
- 36 Leaves all subulate, triangular or rhomboid in section 37
- 37 Leaves spirally arranged, appressed or slightly patent at apex, triangular in section; cones 30-80 mm, ovoid or oblong-ovoid
Sequoiadendron giganteum (Lindl.) Buchholz
- 37 Leaves in 5 ranks, pointing forwards, in-curved, rhomboid in section; cones 10-25 mm, subglobose or broadly ovoid 38
- 38 Crown of tree rather dense with rigid twigs and shoots, side shoots at an angle of 60 degrees; leaves dark green; cones with up to 30 scales, each scale with 5 seeds.
Cryptomeria japonica (L. fil.) D. Don subsp. *japonica*
- 38 Crown of tree more lax with slender drooping twigs and shoots, side shoots at an angle of 40 degrees; leaves yellowish-green; cones with less than 20 scales, each fertile scale usually with 2 seeds
Cryptomeria japonica subsp. *sinensis* (Siebold & Zucc.) P. D. Sell
- 39 Many clusters with more than 8 leaves 40
- 39 Leaves 2-6 in a cluster (*Pinus*) 48
- 40 Leaves deciduous; female strobili with long bracts often exceeding scales; cones not more than 4.5 cm 41
- 40 Leaves evergreen; female strobili with bracts minute or absent; cones more than 5 cm 43

Plant Crib

Larix

41 Young shoots reddish to dark brown; buds resinous; bracts of young cones usually greenish with pink margins; mature cones broadly ovoid, when open nearly as wide as long and when viewed from above with a distinct rosette appearance, the bracts concealed and peduncles reddish

Larix kaempferi (Lindl.) Carrière

41 Young shoots pale yellow to orange-brown; buds not resinous; bracts of young cones usually pink to red; mature cones narrowly ovoid, when open longer than broad, with at least some bracts exerted and peduncles yellow 42

42 Bracts of young cones straight; scales of cones straight or in-curved, all the bracts long-exserted

Larix decidua Mill.

42 Bracts of young cones reflexed; scales of cones slightly curved outwards, the bracts short with a few exerted

Larix × marschlinsii Coaz

Cedrus

43 At least the low branches arching over so that the leading shoot and end of twigs although stiff appear to be drooping or hanging; leaves 25-38(-50) mm; cones 7-14 x 5-9 cm

Cedrus libani subsp. *deodara* (Roxb. ex D. Don) P. D. Sell

43 Branches spreading or ascending so that the leading shoots and ends of twigs are patent or slightly drooping or upturned; leaves 7-35 mm; cones 3-15 x 3-8 mm 44

44 Trees broad, the branches and twigs forming Table tops giving the crown a tiered appearance; cones 9-15 x 6-7 cm

Cedrus libani A. Rich. subsp. *libani*

44 Trees broad or narrow, branches and twigs not forming Table tops; cones 5-12 x 3-6 cm 45

45 Twigs very dense; leaves 7-15(-20) mm; cones 8-12 x 3-5 cm, long tapered from base

Cedrus libani subsp. *brevifolia* (Hook. fil.) Meikle

45 Twigs more spreading and open; leaves 10-35 mm; cones 5-8.5 x 3-6.5 cm, broadly ellipsoid (barrel-shaped) 46

46 Tree pyramidal or columnar

Cedrus libani subsp. *stenocoma* (O. Schwarz) P. H. Davis

46 Tree broad with patent or ascending branches and twigs 47

47 Leaves shining deep green or slightly bluish

Cedrus libani subsp. *atlantica* (Endl.) Batt. & Trab. forma *atlantica* (Endl.) P. D. Sell

47 Leaves bright bluish-grey or even whitish

Cedrus libani subsp. *atlantica* forma *glaucissima* P. D. Sell

Pinus

48 Leaves (4-)5(-6) in a cluster 49

48 Leaves 2 or 3 in a cluster 51

49 Young shoots with short reddish-brown hairs

Pinus strobus L.

49 Young shoots glabrous 50

50 Young shoots shining green; leaves 70-120 mm; cones 80-150 mm

Pinus peuce Griseb.

50 Young shoots glaucous; leaves 80-200 mm; cones 150-250 mm

Pinus wallichiana A. B. Jack.

51 Leaves in groups of 3, rarely mixed with some in pairs 52

51 Leaves in pairs 53

52 Buds cylindrical; cones symmetrical, umbo with a strong erect, persistent mucro

Pinus ponderosa Douglas ex P. & C. Lawson

52 Buds ovoid; cones asymmetrical, umbo with a small caducous mucro

Pinus radiata D. Don

Plant Crib

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- 53 Buds not resinous; cone scales recurved at apex 54
53 Buds resinous; cone scales not recurved at apex 55
- 54 Leaves 18-25 cm; cones 14-22 cm *Pinus pinaster* Aiton subsp. *pinaster*
54 Leaves 10-20 cm; cones 9-18 cm *Pinus pinaster* subsp. *atlantica* Villar
- 55 Leaves 80-160 mm 56
55 Leaves 30-80 mm 58
- 56 Crown pyramidal with irregular branching; leaves straight, rigid, pungent, with 2-3 rows of hypodermal cells *Pinus nigra* J. F. Arnold subsp. *nigra*
56 Crown narrow, cylindrical or ovoid-elongate; leaves often curved, more or less flexible, not or slightly pungent, with 1 or sometimes 2 rows of hypodermal cells 57
- 57 Branches usually more or patent and evenly spread; leaves often twisted; cones with a blunt umbo *Pinus nigra* subsp. *laricio* Maire
57 Branches usually sloping down; leaves straight; cone scales almost smooth *Pinus nigra* subsp. *salzmannii* (Dunal) Franco
- 58 Bark on upper part of trunk flaking to show orange blaze visible at a considerable distance; young twigs yellowish-green; leaves often more or less bluish-green; cone dull 59
58 Trunk without orange-blaze; young twigs green; leaves clear green; cone shining 60
- 59 Crown long remaining pyramidal, rounded only in old trees; bark thin at least above; leaves 30-45 mm; cones 25-45 mm *Pinus sylvestris* subsp. *scotica* (P. K. Schott) E. F. Warb.
59 Crown usually quickly becoming flat-topped; bark sometimes thick; leaves up to 70 mm; cones up to 60 mm *Pinus sylvestris* L. subsp. *sylvestris*
(The introduced *Pinus sylvestris* is really of mixed origin and probably contains more than one subspecies.)
- 60 Leaves straight, resin canals marginal 61
60 Leaves twisted, resin canals median 62
- 61 Shrub up to 3 m; cones 20-50 mm, scales flat or concave-convex, not recurved and hooked *Pinus mugo* Turra subsp. *mugo*
61 Erect tree up to 25 m; cones 50-70 mm, scales recurved and hooked *Pinus mugo* subsp. *uncinata* Mill. ex Mirb.
- 62 Bushy tree with a dense crown up to 10 m; leaves 30-70 x 0.9-1.5 mm *Pinus contorta* Douglas ex Loudon subsp. *contorta*
62 Narrowly conical tree up to 50 m; leaves 40-80 x 1.5-2.0 mm 63
- 63 Buds rounded-ovoid; leaves 40-70 mm; cones 35-40 mm, remaining closed for many years *Pinus contorta* subsp. *latifolia* (Engelm.) Critchf.
63 Buds cylindrical; leaves 50-80 mm; cones 30-60 mm, opening at maturity *Pinus contorta* subsp. *murrayana* (Grev. & Balf.) Critchf.

Author P. D. Sell, March 1988, minor updates 1998.