

Notes for a workshop on Conifers for The Norfolk Flora Group

at Lynford Arboretum on Tuesday 19th March 2019 by

Matt Parratt

with thanks to Ros Bennett whose keys these are based on

CEDRUS – True Cedars: All Cedars have evergreen thick spirally arranged needles in bunches of 20 (10) or more on short shoots. (Like Larches but Larch leaves are deciduous.) From the Atlas mts of Morocco (to Cyprus, *C. brevifolia*) to the Lebanon to the Himalaya. Most key features are unworkable especially in young specimens. These are the 3 most common.

Species	Leading tips of young shoots	Leaf length	Translucent tip of leaf	Cone size	Other features
<i>C. atlantica</i> Atlas cedar	Ascending	15-20mm	Gradually tapering, 0.5mm	c.8cm	Usually the glaucous (blue form) in the UK
<i>C. libani</i> Cedar of Lebanon	Level	15-25mm	Abruptly tapering, 0.2mm	7-10cm	Usually the dark green form in the UK
<i>C. deodar</i> Deodar	Drooping	30-35mm	Gradually tapering, 0.4mm	8-12cm	

Larix – Larches: All Larches have deciduous flat needles in bunches of 20 (10) or more on short shoots. (Like Cedars but Cedars are evergreen.). Larches are extremely hardy at very low temperatures making them useful trees commercially. The cones are persistent for 2 or 3 years. Hybrid larch is in reality quite variable and characters are not always clear cut.

Species	Shoot colour/bloom	Cone scales	Cone size/shape	Young shoots	Other characters
<i>L. decidua</i> European larch	Golden amber/‘blonde’, no bloom	Straight	2-3.5 cm, ovate	Pendent	
<i>L. kaempferi</i> Japanese larch	Dark orange/brown/purple, White waxy bloom	Strongly recurved, ‘rose-like’ appearance from above.	1.5-3.5cm, globose	Horizontal or upturned	
<i>L. x marschlinsii</i> Hybrid/Dunkeld larch	Orange/brown/purple, slight bloom	+/- Slightly recurved	c.4 cm, ovate	Mixed	In reality the hybrid can present with characters between the parents.

Picea – Spruces: The needles of all Spruces are attached to twigs via woody pegs which remain on the twigs when needles fall. Needles are either the same colour all over, or have distinctively different coloured surface. Cones always hang down & > 3cms. . Sitka and Norway are the most common, with Serbian becoming more so. The other two are less commonly seen. Other species can include *P. pungens* 'glauca' (Colorado blue spruce), *P. orientalis* (Oriental spruce), and *P. breweriana* (Brewer's spruce).

Watch out for Hemlocks (*Tsuga* species) where the needles are attached via a short stalk (petiole) which is more or less pressed up against the twigs (appressed).

Species	Needle colour (same = concolourous, different = discolorous)	Needle length	Twig hairs	Cone length cm	Other features
P. sitchensis (Sitka spruce)	discolorous	15 – 25 mm	Glabrous	6 – 10	Cones stubby and more papery than <i>P. abies</i>
P. omorika (Serbian spruce)	Strongly discolorous	8 – 18 mm	Pubescent	3 – 6	Distinctive art deco form, ski-jump branches. Cones clustered at the very top of the tree.
P. engelmannii Engelmann spruce	Concolorous (may sometimes be borderline discolorous)	15 – 25 mm	Pubescent	3.5 – 7.5	Crushed leaves with a menthol scent. Cultivar 'glauca' with strongly glaucous (blue) needles.
P. abies (Norway spruce)	Concolorous	10 – 25 mm Only faintly striped	Glabrous (sometimes pubescent)	10 – 20	Cones like pangolin tails
P. glauca (White spruce)	Concolourous, glaucous grey	8 – 18 mm	Glabrous	2.5 – 6	Crushed leaves with a blackcurrant-like smell, sometimes described as fetid, or mousey!

Pinus – Pines: The long, thin needles of Pines are bound together in bundles of 2, 3, (4) or 5 (8), with the base of the bundle wrapped in a papery sheath. When needles are shed they fall as a bundle rather than individually

SPECIES	Leaves in groups of	Needle length (cm)	Cone length (cm)	Cone scale tips	Needle colour	Other characters
<i>P. pinaster</i> Maritime pine	2	15 - 20	8 – 20		Dark grey/green	Some with twist. Apical buds large, and with strongly reflexed bud scales.
<i>P. nigra</i> Austrian/Corsican	2	8 - 18	3 - 9	Small, stout hook/spine	Green	Corsican more common, <i>P. nigra</i> subsp. <i>laricio</i> .
<i>P. sylvestris</i> Scot's pine	2	2 – 8	2 – 7.5		Glaucous	Many white fibres in broken needle, flaky orange bark in upper trunk/branches.
<i>P. contorta</i> Lodgepole pine	2	3 – 8	2 – 6	Long spine-tipped, wears away as cones age.	Green	Twisted needles. Cones retained for several years.
<i>P. mugo</i> Dwarf Mountain pine	2	2 - 8	5	Small spine	Green	Sprawling, shrubby form. Cones often retained for a few years.
<i>P. ponderosa</i> Western yellow pine	3	15 – 25 x 2mm	7 – 15	Spine-tipped	Dull yellow-green	Cone bases often retained on tree when cones fall.
<i>P. radiata</i> Monterey pine	3	10 – 25 x 1mm	7 – 14	Non – persistent spine	Bright grassy green	Big, asymmetric cones retained for decades.
<i>P. strobus</i> Weymouth pine	5	5 - 14	8 – 20			'Goatees' of short stout hairs immediately below needle bunches. Bark with vertical fissures/strips.
<i>P. peuce</i> Macedonian pine	5	7 - 12	8 - 15			Glabrous twig, bark 'patchy'.

Abies – True/Silver firs: The needles of *Abies* are attached via a sucker-like structure and leave a circular scar when pulled off. The cones are erect and disintegrate on the tree. You might also come across *A. amabilis* (beautiful fir), *A. concolor* (Colorado fir), *A. fraseri* (Fraser fir), and *A. koreana* (Korean fir). Note these foliage characters are for branches low down on the tree, canopy foliage can be quite different!

****Watch out for Douglas fir (*Pseudotsuga menziesii*)** – cones hang down and have prominent 3-pointed bracts, buds are sharply pointed and chestnut brown, leaves smell of citronella.

Species	Arrangement of Needles (Pectinate = spread out in 2 ranks)	Twig pubescence	Cones and bracts	Other features
<i>A alba</i> Eur. Silver Fir	Pectinate	Conspicuous	Up to 15cm, bracts slightly exerted.	<u>Buds not resinous</u> , red/brown Bark with resin blisters in young trees
<i>A grandis</i> Giant Fir	Very Pectinate – like fishbones.	slight	7-9cm, inserted.	Small <u>resinous buds</u> , like grey pearls Grapefruit smell (leaves). Bark with resin blisters in young trees.
<i>A procera</i> Noble Fir	Not pectinate	Conspicuous, reddish	20-25cm, exerted, down pointing (deflexed)	<u>Resinous buds</u> . Upper leaves start appressed, then curve up away from shoot– 'hockey sticks' . Leaves often glaucous ('blue'). Bark with resin blisters in young trees.
<i>A nordmanniana</i> Caucasian Fir	Not pectinate	slight	10-15cm, exerted, down pointing (deflexed)	<u>Buds not resinous</u> , brown, gently pointed. Upper leaves flattened, forward pointing and overlapping (imbricate). Common non-drop Christmas tree.
<i>A cephalonica</i> Grecian fir	Not pectinate. All around the shoot ('bottlebrush-like')	-	15cm, exerted, down pointing (deflexed)	Leaf tips normally pointed compared with other species here.

Cypresses and false cypresses - *Cupressus*, *Chamaecyparis*, *Xanthocyparis*, *Thuja*, and *Calocedrus*:

Species	Cone shape/size	Leaves similar or different	Foliage sprays	Other features
<i>Cupressus macrocarpa</i> Monterey cypress	Globose, 3-4cm	Similar	3D, dark green	Cone scales with a curved central boss. Pollen cones yellow.
<i>Cupressus glabra</i> Smooth Arizona cypress	Spherical, 1.5-2.5cm	Similar	3D, often strongly glaucous.	Bark flaking to reveal reddish-purple or sometimes yellowish patches. Scale leaves with a blob of white resin in centre. Pollen cones yellow.
<i>Chamaecyparis lawsoniana</i> Lawson cypress	Spherical, 0.7cm	Different	2D	Prominent translucent glands in leaves; crushed foliage smells like resinous parsley; leader lops over. Pollen cones initially black, ripening red. Many horticultural cultivars!!
<i>Xanthocyparis nootkatensis</i> Nootka cypress	Spherical, 2cm, scales with prominent central spine.	Similar,	2D, pendulous appearance	Distinctive flame or tear-drop form when open grown. Crushed foliage with a 'rank' oily aroma. Pollen cones yellow
<i>X cuprocypris</i> Leyland cypress	Not all cultivars bear cones. Spherical, 2-3cm. Scales with a blunt central spine.	Generally similar, but variable	3D, 'untidy'	Usually columnar, Pollen cones yellow
<i>Thuja plicata</i> Western red-cedar	Goblet/tulip shaped,	Different	2D	Crushed foliage with a strong sweet smell like fruit salad penny chews, Wrigleys juicy fruit chewing gum, or fake pineapple. Many cultivars!
<i>Thuja orientalis</i> Chinese thuja	Ovoid, 1-1.5cm. Waxy bloom when young.	Different	2D, vertical sprays	Foliage with very little or no scent; cone scale tips with strongly reflexed hooks. Seeds wingless
<i>Calocedrus decurrens</i> Incense cedar	2cm, goblet/tulip shaped. 2 fertile scales	Different	2D, vertical sprays	Crushed foliage smells of boot polish. Distinctive 'torpedo' silhouette. Pollen cones yellow.

Redwoods and allies - *Sequoia*, *Sequoiadendron*, *Metasequoia*, *Cryptomeria*, *Taxodium*: Originally in their own family (*Taxodiaceae*), but now in the Cypress family (*Cupressaceae*).

Species	Leaves	Cones	Bark	Other features
<i>Sequoia sempervirens</i> Coast redwood	Scale like on leaders, linear on laterals. Stiff.	Barrel shaped	Soft, fibrous, reddish	Branchlets with a distinct 'pinch point' gives appearance of a chain of feathers.
<i>Sequoiadendron giganteum</i> Giant redwood/Wellingtonia	Scale-like, 'dreadlocks'	Barrel shaped, 'hand grenades'. Scales like Mick Jagger lips	Soft, fibrous	Massive trunk. Slight aniseed scent if 'heels' are removed.
<i>Metasequoia glyptostroboides</i> Dawn redwood	Appear to be strongly opposite, linear, 'feathery', deciduous	Ovate, with a long stalk. Usually only in upper parts of crown.	Hard, fibrous, reddish	Heavily fluted trunk
<i>Cryptomeria japonica</i> Japanese cedar/Sugi	Awl or talon like, slightly incurved	Globose, with hooked scale tips. Abundant.	Hard, reddish, peeling in long vertical strips.	Prolific cone production from a young age.
<i>Taxodium distichum</i> Swamp cypress	Appear to be alternate, linear, 'feathery', deciduous	Ovate-globose, with short stalk. All over the tree.	Hard, more brown than red.	Often planted by water and with 'knees' (pneumatophores) pushing through the soil nearby.