



TILIA

For identification of species of *Tilia* it is essential to obtain shoots from the exposed part of the tree's crown which have flowers or fruits, or the potential to produce them. Shoots from sprouts, shaded branches or the lower part of the canopy are difficult or perhaps impossible to identify. The two native British species are variable (particularly *T. platyphyllos*) and hybridise, but the distribution of hairs and types of hair on the leaves, the position of the inflorescences and above all the size of the fruits, their form and thickness and strength of the fruit wall, provide reliable characters. *Tilia platyphyllos* is often planted and some provenances are very different from the native plant; for example, races from SE Europe and the Alps may have completely glabrous leaves (but never glaucous on the underside).

***Tilia cordata* Mill.**

Twigs in the first-year glabrous, shining. Buds 6-7 × 4-5 mm, ovoid, usually with only two scales exposed, their outer surface glabrous, shining.

Leaves: Lamina circular, 35-70 mm in diameter, usually cordate at the base with a long terminal acumen; upper surface flat, dull green, glabrous; lower surface glaucous (not on shade leaves!), with obscure transverse veins when fresh, glabrous except for patches of reddish-brown, tangled, stellate hairs in the axils of the main veins and often spreading along part of the vein at the base; marginal teeth triangular with a very short, blunt tip. Petiole slender, glabrous, often more than 2/3 the length of the lamina.

Bracts 35-60 × 9-18 mm, often elliptical, usually with a long stalk. Inflorescence held above the bract. Flowers 5-20, each with 25-35 stamens.

Fruits, when sterile small and spherical, when fertile 6-8 mm × 4-5 mm, ellipsoidal to obovoid with a slightly asymmetrical point (style base) (shaped like a lemon), covered in dense brown tomentum; wall 0.25-0.35 mm thick, fragile and easily crushed when squeezed between fingers.

***Tilia platyphyllos* Scop. subsp. *cordifolia* (Besser) C. K. Schneid.**

Twigs in their first year usually with at least patches of sparse or dense, flat stellate hairs and sometimes simple hairs. Buds 7-9 × 5-6 mm, ovoid, subacute, usually with three scales exposed their surfaces glabrous or with sparse stellate hairs.

Leaves: Lamina variable in size, circular to broadly ovate, 40-130 mm in diameter, cordate or obliquely truncate at the base, with a relatively short acumen; upper surface gently rugose, green with sparse simple hairs at least along the main veins; lower surface pale green (not glaucous) with simple hairs forming a velvety fur along the main veins and often over the whole surface; transverse veins apparent in fresh material. Marginal teeth triangular, usually acute with a well defined tip. Petioles usually more than 1.5 mm diameter, glabrous or hairy, usually less than 1/3 the length of the lamina.

Plant Crib

Bracts 45-110 × 15-22 mm, oblong or oblanceolate with a short stalk (to 5 mm) or almost sessile, with hairs on the surface without the peduncle. Inflorescence hanging below the leaves with 1-5 flowers, each with 35-45 stamens.

Fruits usually fertile, 9.5-12 × 8.5-11 mm, almost spherical and generally flat at the apex, becoming pentagonal in cross section when dry, usually ribbed, covered in white tomentum; wall 0.8-1.1 mm across, not easily broken when squeezed between the fingers.

Hybrids

Hybrids occur where the two species grow naturally together though *T. cordata* flowers about 10-15 days later than *T. platyphyllos*. Natural hybrids show a wide range of morphological intermediacy (Pigott 1969). Hybrid clones have been widely planted since the sixteenth century (Pigott 1992). The most striking is *T. × europaea* L. 'Pallida' (in fact, the Linnaean type) with buttressed and fluted trunk, bearing epicormic bud-clusters which often produce dense masses of sprouts, even within the crown. The leaves are characteristically obliquely truncate or shallowly cordate, glabrous except for discrete groups of pale brown, tufted hairs in the axils of the main veins. The bracts are elliptical and the inflorescences, each with about 7 flowers, hang below the leaves. A second clone related to the Dutch 'Zwarte Linde' is also widely planted, and has a cylindrical trunk, with occasional sprouts at the base; the leaves are cordate and more or less glabrous except for patches of tufted hairs in the vein axils, and the bracts are oblanceolate and bear 3-5 flowers. Both these hybrid clones have almost spherical fruits but otherwise are intermediate in characters between the two species. The fruits are fertile and a proportion of the progeny of 'Pallida', at least, are indistinguishable from *T. platyphyllos*.

Three other taxa of *Tilia* are often planted but rarely in natural situations (see also Pigott 1997 for planted taxa). *Tilia × euchlora* Koch has a densely branched, bell-shaped canopy with green twigs, greenish-pink winter buds, dark green glossy cordate leaves, the marginal teeth small and triangular with short but prominent tips. The pale yellowish green bracts are narrowly elliptical and bend stiffly back at the attachment of the peduncle. The fruits are ovoid, subacute and sterile (this is in keeping with the supposed origin of the clone as a hybrid between *T. cordata* ($2n = 82$) and the Crimean *T. dasystyla* ($2n = 164$)). Two varieties of *T. tomentosa* Moench are often planted and both have dense white tomentum on the underside of their leaves and tomentose young twigs and small tomentose winter buds. The type has relatively short petioles and often shallowly lobed leaves with irregular marginal teeth; the fruit are fertile and ellipsoidal with a terminal point. Seedlings often occur. *Tilia tomentosa* 'Petiolaris' is a handsome weeping tree with asymmetrical cordate leaves, even teeth and long slender petioles; the fruit are spherical and sulcate (with five grooves like a peeled tangerine) and although fertile do not germinate in normal conditions.

- References** Pigott, C. D. (1969). *Journal of Ecology* **57**: 491-504.
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