EPILOBIUM (WILLOWHERBS) IN HAMPSHIRE: WORKSHOP NOTES

Issue 1
24th July 2013

Martin Rand, BSBI Recorder (South Hants)
Mike Rowe

Introduction

Willowherbs (*Epilobium*) are a genus in the family *Onagraceae*, which in Britain also includes the following genera:

- *Chamerion* (Rosebay Willowherb)
- *Ludwigia* (Hampshire-purslane and Water-primroses)
- *Oenothera* (Evening-primroses)
- *Circaea* (Enchanter's-nightshades)

and a few garden ornamentals.

Most members of the family occurring in Britain have 4 sepals, 4 petals, 8 stamens, and a single style which may be unlobed or 4-lobed according to species. Exceptions are *Circaea* (2 sepals, 2 petals, 2 stamens), *Ludwigia palustris* (4 sepals, 4 petals, 4 stamens) and some other *Ludwigia* (5 sepals, 5 petals, 10 stamens). All *Epilobium* follow this pattern. This combination will usually separate out species from members of *Brassicaceae*, which have 6 or, less commonly, 4 stamens. Also in *Epilobium* the sepals are normally fused for a short distance at the base, the fruits split into 4 down the mid-line of each cell of the ovary from the summit, and the seeds have a distinctive long plume of hairs.

Epilobium species are perennial, but this may not always be obvious: young plants can flower early in life, and in some species flowering stems come from rosettes with insubstantial root systems that have arisen from vanished stolons.

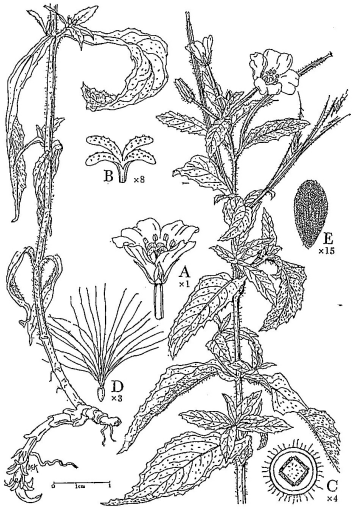
True species of *Epilobium* are not too challenging to identify. Problems can arise either because of the widespread hybridisation in the genus, or because you think you have a hybrid when you don't – the species themselves can be variable in size or in one or more other characters. It's important to consider the full range of characters; to look at the population of plants; and, wherever possible, to look at the seed viability: most hybrids have low fertility. There is a section towards the end of these notes giving some information on the reliably recorded hybrids likely to occur in our area involving two parents. (Three-way crosses are also known.)

Hampshire Willowherbs – a key to species

Creeping plant; only tips of shoots ascending	Stigma club-shaped	Stems with lines of short non-glandular hairs	Glandular hairs absent	Leaves with several (3-14)sharp teeth	Leaves with faint lateral veins usually visible only below				*E. pedunculare* Rockery Willowherb
				Leaves with a few blunt teeth		Seeds minutely papillose			*E. brunnescens* New Zealand Willowherb
					Leaves with prominent lateral veins visible above	Seeds smooth			*Epilobium komarovianum* Bronzy Willowherb
Greater part of stem ascending	Stigma 4-lobed; stems round	Stems with spreading non-glandular hairs	Prominent glandular hairs on upper parts	Leaves more or less clasping, with line running onto stem	Leaves oblong to lanceolate, rounded at base	Leaves toothed all round	All or nearly all leaves opposite	Petals 12-16mm, shallowly lobed, deep pink	*Epilobium hirsutum* Great Willowherb
			Glandular hairs short, often sparse	Leaves unstalked, not running onto stem	Leaves ovate to oblong-lanceolate, rounded at base			Petals 6-9mm, quite deeply lobed, pale pink	*Epilobium parviflorum* Hoary Willowherb
		Stems glabrous or with non-glandular hairs short, appressed or incurved		Leaf stems often short, not more than 6mm	Leaves ovate-lanceolate to lanceolate, rounded at base			Petals 8-10mm, deeply lobed, pale pink becoming darker	*Epilobium montanum* Broad-leaved Willowherb
				Leaf stems up to 8mm	Leaves elliptical to elliptical-lanceolate, broadly wedge-shaped at base	Leaves untoothed towards base	Upper leaves usually alternate	Petals 6-8mm. shallowly lobed, white becoming progressively pinker	*Epilobium lanceolatum* Spear-leaved Willowherb

Greater part of stem ascending *(continued)*	Stigma club-shaped	Glandular hairs absent, or very sparse on stem	Glandular hairs totally absent	Leaves unstalked or with stems 3mm or less	Leaves broadly linear to narrowly lanceolate (not more than 1.7cm broad)	4 prominent raised lines on stem (esp. lower stem)	Upper leaves usually alternate; toothing obvious	Petals 5-7mm, deeply lobed, mauve-pink	*Epilobium tetragonum* Square-stemmed Willowherb
			Glandular hairs absent or very sparse on upper stem			Stem round or with two very faint lines	Most or all leaves opposite; toothing absent or obscure	Petals 4-7mm, lobed, pale pink or lilac	*Epilobium palustre* Marsh Willowherb
		Glandular hairs more obvious, on various parts of plant	Glandular hairs confined to floral parts			Stem with 2 or 4 raised lines (if 4 then 2 often faint)	Upper leaves usually alternate	Petals 5-6mm, shallowly lobed, deep pink	*Epilobium obscurum* Short-fruited Willowherb
			Glandular hairs on upper stem and floral parts					Petals 3-6mm, deeply lobed, pink-purple	*Epilobium ciliatum* American Willowherb
				Leaf stems 3-20mm	Leaves ovate-elliptical, 1.5-3cm broad			Petals 4-7mm, shallowly lobed, white becoming veined pink	*Epilobium roseum* Pale Willowherb

Hampshire Willowherb species

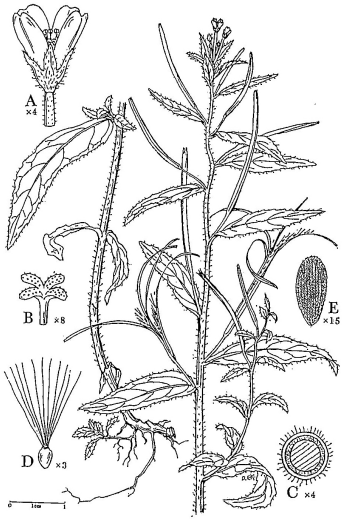


***Epilobium hirsutum* L.** **Great Willowherb**

In flower this is an easily recognised species because of its robustness and its large, richly coloured (or rarely white) flowers. It produces sturdy long white sub-surface stolons in summer. The rosettes of leaves on young shoots early in the year can be deceptive, as they are largely hairless and shiny. There are forms with more (var. *hirsutum*) and fewer (var. *villosissimum*) long eglandular hairs on the upper parts.

It is a native occurring in choked streams and stream margins, ditches, tall-herb marshes and fens, avoiding acid conditions and tolerant of nitrogen enrichment. Occasionally it appears on drier waste or disturbed ground, or even in arable, but much less so than *E. parviflorum*.

It is widespread across Britain apart from the most upland areas. In Hampshire it occurs in most parts of the county but is rare on much of the central chalk plateau and the centre of the New Forest, for lack of suitable habitat.

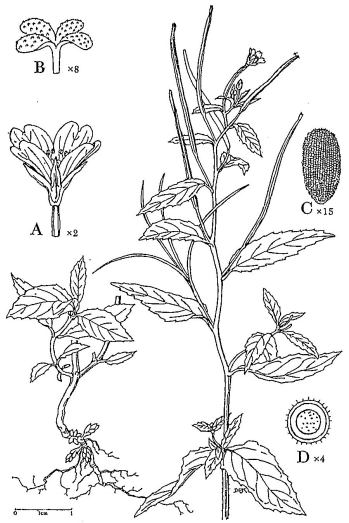


***Epilobium parviflorum* Schreb.** **Hoary Willowherb**

With much smaller and generally paler flowers than *E. hirsutum*, this species can usually be picked out easily by its cross-shaped stigma and densely and softly hairy upper parts. It produces short stolons and overwintering rosettes.

Like *E. hirsutum*, it occurs in a wide range of wet habitats but is less tolerant of nitrogen enrichment. It occurs more frequently in arable fields and on waste and disturbed ground.

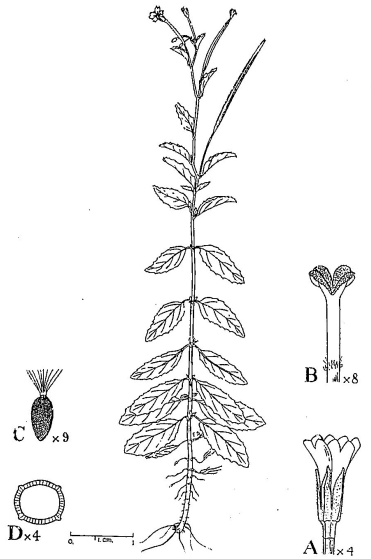
It is again widespread in all but the most upland areas in Britain; in Hampshire it is widespread across the county but more scattered on the central chalk plateau and much of the New Forest. It is probably somewhat under-recorded.



Epilobium montanum L. — Broad-leaved Willowherb

This is quite a distinctive species, with 4-lobed stigma and broad shortly-stalked leaves, rounded at the base. Leaves are usually opposite most of the way up the stem, or occasionally in whorls of three. It has glandular hairs on the upper part of the stem, usually fairly sparse but sometimes more numerous; also on the flower stalks and sepals, but there often very inconspicuous. It produces short stolons in autumn (often more or less buried) with overwintering buds throwing up leaf rosettes later in the next year.

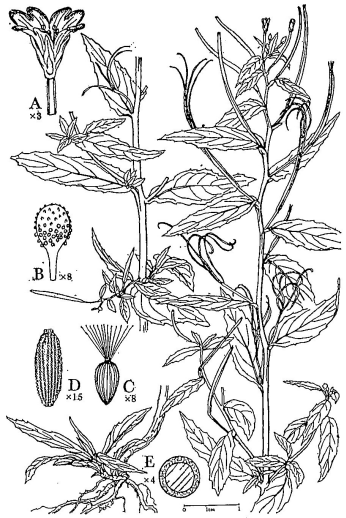
This is one of our commonest and most widespread willowherbs, especially in shady and rather damp places, but can also occur as a weed of gardens and waste ground. In Hampshire is is in all parts of the county, but thins out on drier soils on the chalk.



Epilobium lanceolatum Sebast. & Mauri — Spear-leaved Willowherb

The last of the species with a cross-shaped stigma, this can often be spotted from a distance because of its unbranched or very simply branched stem. Upper leaves are most often alternate, untoothed and more or less wedge-shaped at the base, and narrowing into a conspicuous stalk (typically at least 4mm long). There are short glandular hairs on the upper part of the stem, flower stalks and sepals. Flowers usually start white in bud, turning pinker as they open. In late autumn it produces short above-ground stolons with leafy buds, developing into rosettes in the next year.

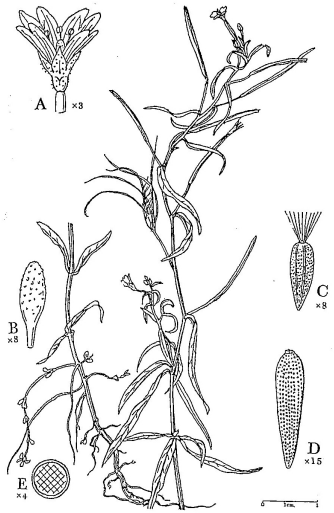
This is a plant of dunes and all sorts of open and waste ground, favouring infertile and somewhat acid soils . It is pretty well confined to the southern half of Britain, especially the south-west. In Hampshire it may be under-recorded but seems to be scarce, with concentrations around the southern fringes of the New Forest and the heathlands of East Hampshire. It is absent from the chalk.



Epilobium tetragonum L. — Square-stalked Willowherb

We come now to a group of rather confusingly similar species with club-shaped stigmas and narrow, unstalked or shortly stalked leaves. A key character in this species is the total absence of glandular hairs. The stem usually has four prominent ridges or wings, especially in the lower half, giving it a square-stemmed appearance; several other species also have two or four such lines running down from the leaf bases, but in none are they so prominent. The leaves are narrowly oblong to lanceolate with fine but frequent teeth. In autumn very short stolons are produced that throw up a lax untidy-looking rosette of overwintering leaves. In open ground these can often be spotted next to the remains of last season's stems. Two forms have been described as subspecies, but intermediates can be found: subsp. *tetragonum*, with leaves running into ridges onto the stem, and subsp. *lamyi*, with leaves not decurrent but narrowing into a short stalk, and sometimes with less toothed leaves and larger flowers.

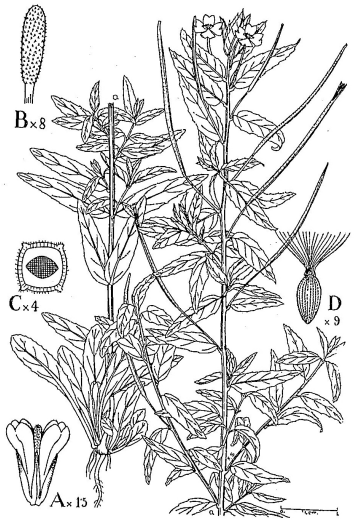
It is widespread south of a line from the Ribble to the Tweed, and common in southern Britain where it inhabits damp banks of streams and ditches, hedgerows and woodland glades, but also arable and fallow land on heavier soils, preferring rather acid conditions. In Hampshire it is widespread but rarer over chalk.



Epilobium palustre L. — Marsh Willowherb

This is another species usually lacking glandular hairs, but it may have a few at the top of the stem only. It can reach 60cm but is often a rather neat, small, little-branched plant. Leaves are nearly all opposite, narrow, blunt-tipped, untoothed or with barely discernible tiny teeth. The inflorescence often has a characteristically droopy tip as it comes into flower. Stolons are long and thread-like, with a tight, bulb-like scaly overwintering bud which is hard to find in the vegetation.

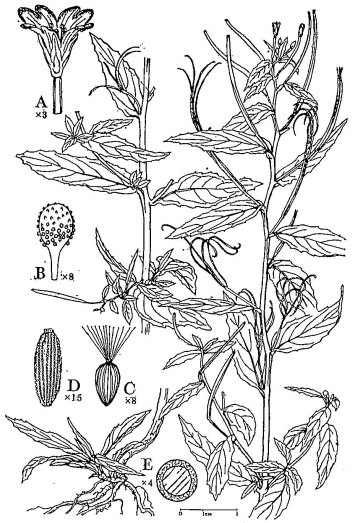
This is a more specialist species than most others, favouring generally acidic marshes and mires with a short to medium length herb layer, and with a very low tolerance of nutrient enrichment. It is commonest in the north and west of Britain, rare or absent in parts of eastern and south-eastern England. In Hampshire it is a very characteristic plant of suitable habitat in the New Forest / Avon Valley, Thames Basin and Wealden heathland, with a thin scattering of records elsewhere.



Epilobium obscurum Schreb. — Short-fruited Willowherb

This species bears glandular hairs only on the sepals, the tube at their base, and sometimes on adjoining parts of the developing fruit. Stems typically curve upwards from a spreading base and can be quite well-branched in robust specimens. Leaves are blunt-tipped with a few well-separated teeth, rounded at the base and unstalked, running into lines on the stem. The fruit can appear fairly short in relation to the overall plant, but not (4-6cm) so much so as to be very distinctive. Stolons are slender, fairly long, with occasional pairs of small leaves but no overwintering rosettes.

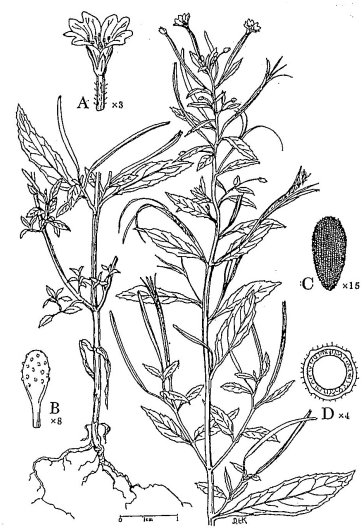
This is a plant predominantly of less base-rich damp and marshy places, also in waste and cultivated ground but less frequently so than *E. tetragonum*. It is only moderately tolerant of nutrient enrichment. It occurs across the whole of Britain, thinning out only in the Fens and more mountainous parts of Scotland. In Hampshire it is found predominantly away from the chalk plateau.



Epilobium ciliatum Raf. — American Willowherb

This is one of the taller species, and larger specimens are often well-branched. It is conspicuously glandular on all the upper parts of the stem as well as the sepals, calyx-tube and fruit. Leaves have an acute tip, frequent, irregular teeth, and a rounded to almost cordate base, sessile or on a short stalk. This is the only upright Willowherb occurring in Britain that has no stolons, although *E. roseum*'s may be very short and inconspicuous. Rosettes of uncharacteristic little rounded leaves form towards the end of summer.

A North American species first recorded in Britain in 1891. Since then it has gone on to colonise all of the country apart from some of the more mountainous and northern areas, and in many places is now one of the commonest Willowherbs to be found. It inhabits all sorts of damp and dry, shady and sunny habitats including waste and cultivated ground and is fairly tolerant of nutrient enrichment. In Hampshire it is known and generally common in all parts of the county.



***Epilobium roseum* Schreb.** **Pale Willowherb**

Glandular-hairy on upper parts of stem and on sepals, calyx-tube and fruit like *E. ciliatum*, this species can be distinguished by its broader leaves and comparatively long leaf stalks. The pallid flowers are also distinctive. The leaves have an acute tip, and are serrately toothed except on the rather narrowly wedge-shaped base. Short late autumn stolons bear rather lax overwintering rosettes of more or less sessile leaves.

This is a plant of shady damp, waste or cultivated ground. In the south, when found by walls and buildings, it is often on the north-facing side. It is quite tolerant of nutrient enrichment. It is widespread (but often not common) north to Lancashire and Yorkshire and in the Scottish central lowlands. In Hampshire records are rather sparse, and show little pattern other than some clustering around urban centres; this may just reflect recording bias.

***Epilobium brunnescens* (Cockayne) P.H. Raven & Engelhorn** **New Zealand Willowherb**

This is a native of New Zealand first recorded in 1908 and very common over northern and western Britain. In Hampshire it has been recorded a handful of times in widely scattered parts of the county on damp bare and waste ground and as a garden weed.

***Epilobium pedunculare* A. Cunn.** **Rockery Willowherb**

Another New Zealand species found mostly in the upland and western parts of Britain as a weed of damp, bare ground in gardens and on roadsides. It has not yet been recorded in Hampshire but is known from a couple of neighbouring counties.

***Epilobium komarovianum* H. Lév.** **Bronzy Willowherb**

Yet another New Zealand species with a very scattered distribution as a garden weed, mostly in wetter parts of the country. Not yet recorded in Hampshire but may turn up.

Hybrids

Epilobium has a well-deserved reputation for producing hybrids, and 53 have been described for Britain (nearly 4 times the number of species described). However, this does not mean that hybrids are ubiquitous, and some are exceedingly rare – in some cases, not seen for a century or more. Below are some tips on recognising those more likely to be encountered in the south of England. At the moment, the best account of hybrid characters in one reference work is in Sell & Murrell (2009).

Here are some general guidelines.

- Before thinking about hybrids, make sure you know your species and the range of variation within each.
- Look at the whole population as far as possible and determine what you have in the way of good species, taking into account all the characteristic features. You may or may not find the fully or mostly sterile hybrids in the absence of the parents.
- Hybrids often occur only as single plants.
- Hybrid vigour is a useful pointer but remember that some species (particularly the more nitrogen-tolerant as well as *E. ciliatum*) can be large and much-branched. However hybrids do often have long branches overtopping the main stem.
- Hybrids often have extended flowering periods, going on into late August or September.
- Fully or partially sterile species will have at least a proportion of abortive seeds. Check a ripening fruit to see if there are gaps in the lines.
- Plants that are hybrid between species of different stigma shape will have irregular or half-hearted cross-shaped lobing. But beware of flowers that have not fully developed; lobing in these will also be obscure. Also *E. hirsutum* can produce poorly formed lobes without being hybridised.
- Plants that are clearly not *E. hirsutum* or *E. parviflorum*, but have long spreading hairs, are good candidates for hybrids involving one or other of those as parents.
- Plants that are clearly not *E. hirsutum, E. parviflorum*, *E. ciliatum* or *E. roseum* but have **abundant** spreading glandular hairs are good candidates for hybrids involving one or other of those as parents.

The commoner hybrids

Name	Parentage	Fertility	Frequency
E. x *erroneum*	*E. hirsutum* x *E. montanum*	Very low to none	Fairly frequent N to central Scotland
E. x *subhirsutum*	*E. hirsutum* x *E. parviflorum*	Moderate	Fairly frequent N to Lancs and Durham, very rare elsewhere
E. x *brevipilum*	*E. hirsutum* x *E. tetragonum*	Usually none	Rare, SE and E England and Midlands N to Yorks.
E. x *palatinum*	*E. parviflorum* x *E. tetragonum*	Moderate	Rare N to Humber / Trent, commonest in E

Name	Parentage	Fertility	Frequency
E. x *persicinum*	*E. parviflorum* x *E. roseum*	?	Scarce in S, E and Midlands
E. x *limosum*	*E. montanum* x *E. parviflorum*	Moderate to high	Fairly N frequent to Lancs and Yorks
E. x *heterocaule*	*E. montanum* x *E. roseum*	Moderate	Scarce N to central Scotland but with several Hants records
E. x *schmidtianum*	*E. obscurum* x *E. palustre*	Moderate to high	Scarce throughout Britain
E. x *dacicum*	*E. obscurum* x *E. parviflorum*	Low to none	Fairly frequent N to Scottish border
E. x *novae-civitatis*	*E. ciliatum* x *E. hirsutum*	Low	Frequent in SE England, scattered and often localised N to central Scotland
E. x *interjectum*	*E. ciliatum* x *E. montanum*	Low to fairly high	Common in S Britain, widespread but rarer in N and Scotland. Probably the commonest hybrid
E. x *vicinum*	*E. ciliatum* x *E. obscurum*	Low to fairly high	Another relatively common hybrid, widespread over much of Britain
E. x *floridulum*	*E. ciliatum* x *E. parviflorum*	Low to fairly high	Frequent N to Lancs and Yorks, rare elsewhere
E. x *mentiens*	*E. ciliatum* x *E. tetragonum*	High to full	Probably common in SE, rare elsewhere

Further reading

Clapham, A R, Tutin, T G & Moore, D M (1987): *Flora of the British Isles*, pp. 261-265, Cambridge University Press. I find the key more usable, and the accounts more extended, than in Stace. Short on mention of hybrids.

Compton, R H (1911): Notes on *Epilobium* hybrids. *London Journal of Botany*, **49**: 158-163.

– (1913): Further notes on *Epilobium* hybrids. *London Journal of Botany*, **51**: 79-85.

Both the above are available online at http://archive.org. Valuable notes on how to go about identifying hybrids, as well as detailed accounts of a few.

McClintock, D (1972): New Zealand Epilobiums in Britain. *Watsonia*, **9**: 140-142. Notes on the occurrence of all three creeping species mentioned in these notes, with a key. Online: http://archive.bsbi.org.uk/Wats9p137.pdf.

Preston, C D (1988): The spread of *Epilobium ciliatum* Raf. in the British Isles. *Watsonia,* **17**: 279-288.

Sell, P D & Murrell, G (2009): *Flora of Great Britain and Ireland*, vol. 3, pp. 118-132, Cambridge University Press. This is the best reference to get detailed accounts of hybrids in one place at present.

E S Marshall contributed notes on *Epilobium* to the *London Journal of Botany*, vols. 26-29, 54 and 56. Online: http://archive.org.

G M Ash, R H Compton and P M Hall also supplied helpful notes on hybrids in several volumes (2, 3, 11, 13) of the *Rep. Bot. Soc. Exch. Club Brit. Isles.* Online: http://archive.bsbi.org.uk/bec_reports.html

There are notes on many hybrids in issues o*f BSBI News*. Check the online index at http://archive.bsbi.org.uk/BSBINewsIndex.pdf.