

## *Geum macrophyllum* – an alien that is spreading in Great Britain

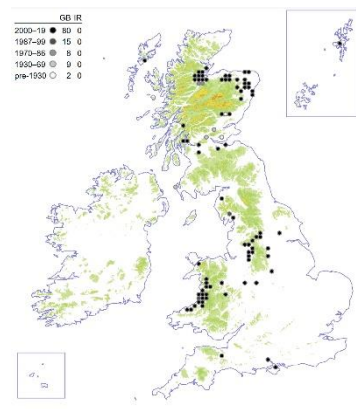
Maria Chamberlain and Chris Jeffree describe how to distinguish this plant from *Geum urbanum*



The large-leaved avens, *Geum macrophyllum* Willd., is larger showier and brighter than our native *Geum urbanum*. Its native range extends across North America, over the Bering Sea to north-eastern Russia (Gajewski, 1957). The BSBI map shows that it is now gaining strongholds in several areas of the UK, although there appear to be none in the London area. In 2003 Stace recorded it in 17 vice-counties; in 2013 the BSBI Distribution Base showed records from 25; in 2019 it showed up in 80. It was first reported in our home area of Stockbridge in 2010 (McKean and McHaffie, 2012). However, we first became aware of it in Inverleith Park just this year, although we did do a thorough survey of the area during lockdown. Although, this species was not mentioned in Plant Life of Edinburgh and the Lothians (2002), it was reputedly already here in the Botanic Garden on Inverleith Row, introduced as a bona fide collection in 1967 from the University of British Columbia. There were then additional collections from Kyoto in 1980 and Hoyt Arboretum in 1988 (Hinchcliffe, pers. comm). Is it possible that these collections in the RBGE and/or the changing climate are responsible for its subsequent spread?

The differences between morphological characters of *Geum urbanum* and *Geum macrophyllum* are summarised by Chris Jeffree in the following table:

<i>Geum urbanum</i>	<i>Geum macrophyllum</i>
Calyx patent or weakly reflexed	Calyx fully reflexed
Calyx visible when flower viewed from above	Calyx not visible from above
Petals, narrowing from half way and bluntly pointed	Petal broader, tips incurved giving a notched appearance
Flowering stems thin, 1-1.5mm	Flowering stems thicker, 2-4mm
Sparse cyme with few 2(3)4 flowers	Crowded cyme with 8-15 flowers
Peduncles long >10cm and thin	Peduncles short 2-7 cm and thicker
Glands and long hairs on peduncle, shaggy	No glands; short hairs on peduncle, velvety.
Foliage dark green	Foliage light yellow-green
Stem leaves sparsely hairy, no glands	Stem leaves sparsely hairy, no glands.
Leaves coarsely toothed; red hydathodes	Leaves less coarsely toothed with large white hydathodes*
Stem leaves 3-lobed, stipulate	Stem leaves 3-lobed, stipulate, larger
Leaf lobes elliptical	Leaf lobes rounded
Receptacular hairs long, up to 2.5mm or half the length of ripe achenes	Receptacular hairs absent or microscopically short
Poland (2009) says both have red hydathodes – not so on our samples	



*Geum macrophyllum* Willd. in BSBI Online Plant Atlas 2020, eds P.A. Stroh, T. A. Humphrey, R.J. Burckmar, O.L. Pescott, D.B. Roy, & K.J. Walker. <https://plantatlas2020.org/atlas/2c044p9h.kbs>



**Left:** *Geum urbanum* at the base of a wall, Comely Bank, Edinburgh

**Right:** *Geum macrophyllum*, by the pond in Inverleith Park, Edinburgh

The question we are now asking is whether some of the plants we are seeing are in fact hybrids between these two species. There is of course also our native *G. rivale*, which is well known to hybridise with *G. urbanum*. The fact that hybrids between all three species exist has been confirmed by Wilcox (2015). He describes the hybrid as *Geum x convallis* M.P. Wilcox, hybr. nov. (*G. macrophyllum* Willd. x *Geum urbanum* L.) with sterile pollen and achenes. McKean and McHaffie (2012) reputedly discovered hybrids in our local area of Stockbridge in 2011, but Wilcox, who subsequently examined all the sites carefully, concluded that all were fertile and hybrids were not present. Our own findings corroborate that because none of the plants we found had sterile achenes, but.... the search continues.



**Left:** *Geum urbanum*. An exposed receptacle showing long hairs

**Centre:** *Geum macrophyllum* exposed receptacle without visible hairs

**Right, top:** Red hydathodes on leaf teeth of *Geum urbanum*; **Right bottom:** White hydathodes on leaf teeth of *Geum macrophyllum*

### References:

- Gajewski, W. 1957. A cytogenetic study on the genus *Geum*. *Monographiae Botanicae*, **4**, 1–416.  
 McKean, D. & McHaffie, H. 2012. A new hybrid to Europe: *Geum macrophyllum* from North America and *G. urbanum*. *BSBI Scottish Newsletter*, **34**, 14.  
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 Smith, P.M., 2002. *Plant Life of Edinburgh and the Lothians*. Edinburgh University Press.  
 Wilcox, M.P. (2015). *Geum x convallis* (*G. macrophyllum* x *G. urbanum*, Rosaceae): a new *Geum* hybrid from England. *New Journal of Botany* **5**, 26-31.

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**Left:** Flower of *Geum urbanum*. The flowers are borne on long pedicels, the sepals patent and visible between the petals which are flat and taper to a blunt point

**Centre:** Flower of *Geum macrophyllum* face view, showing incurved petal tips. The sepals are not visible between petals

**Right:** *Geum macrophyllum* side view, showing the very short pedicels, bringing the flowers into crowded groups, the sepals strongly reflexed