Gentianella campestris & G. uliginosa

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Status

G. campestris:
UK Biodiversity Action Plan Priority species.
IUCN Threat category: Vulnerable (2005).
G. uliginosa:
UK Biodiversity Action Plan Priority species.
Red Data Book.
Schedule 8 Wildlife & Countryside Act 1981.
IUCN Threat category: Vulnerable (2005).

Taxonomy

Magnoliopsida: Gentianaceae
Scientific name:
Gentianella campestris (L.) Börner
Common names:
Field Gentian, Crwynllys y Maes

Magnoliopsida: Gentianaceae
Scientific name:
Gentianella uliginosa (Willd.) Börner
Common names:
Dune Gentian, Crwynllys y Tywod

Gentianaceae is a distinctive family of ± hairless annual to perennial herbs with leaves in opposite pairs and no stipules, tubular flowers with 4, 5 or more lobes at the top, a superior ovary and the fruits are linear capsules which split from the top.

Six genera are represented in Great Britain, two of which can be confused with *Gentianella*: *Gentiana* which has truly blue (rather than pinky-purple) flowers and small lobes between the big petal-like lobes of the flowers, and *Gentianopsis* which has the outsides of the petals cut into long fringes like eye-lashes (the sole British representative is often treated as *Gentianella ciliata* (L.) Borkh.).

Biology & Distribution

Gentianellas are all annual or biennial herbs of nutrient-poor, species-rich, calcareous or weakly acidic grasslands, which can vary enormously in abundance from year to year. One to three species may be present in any one locality.

Gentianella campestris was once widespread but scattered in the lowlands where it has declined dramatically due to habitat loss. It is still locally frequent in the uplands (Preston *et al*. 2002).

Gentianella uliginosa is very rare species which is currently known in Devon (Holyoak 1999), and along the south coast of Wales from the Gower to Tenby (Lousley 1950). It is probably extinct in Derbyshire (Rich 1996), and records from Scotland (Rose 1998) are errors for annual *G. amarella*. It could be over-looked elsewhere.

Identification & Field survey

Identification of *Gentianella* can be problematical for four main reasons (Pritchard 1959):

i. Extensive hybridisation occurs between some of the species which may result in introgression.

ii. Any one population of some species may contain both annuals and biennials, which frequently differ in such characters as habit and leaf shape.

iii. Local populations show great variability in morphology which is partly related to (i) and (ii).

iv. There is considerable variation between separate populations in small geographical areas.

Gentianella campestris (L.) Börner (*Gentiana campestris* L., *Gentianella baltica* sensu E. Warb. *et al*., non (Murb.) Börner, *G. campestris* (L.) Börner subsp. *baltica* auct., non (Murb.) Tutin).
This is a distinct species, easily recognised by the calyx which has two very large lobes wrapped around and often encasing 2(-3) smaller ones (Figure 1a). Hybrids with *G. amarella* have been reported on the continent but not Britain.

Gentianella uliginosa (Willd.) Börner (=*Gentiana uliginosa* Willd., *Gentianella amarella* (L.) Börner subsp. *uliginosa* (Willd.) Tzvelev).
This species is similar to *G. amarella* which grows with it at every site, and the two have often been confused though they are quite distinct species. Pritchard (1959) reported that they hybridise freely but we have been unable to find clear evidence of this in recent years (Kay & John 1995, T. Rich, pers. obs.). *G. uliginosa* is also similar to *G. anglica* which has a regular calyx like *G. amarella* and narrower leaves.

Populations should be documented in full; vouchers can consist of photographs taken from the side

preferably with a close-up of the calyx and supported by field measurements. If hybridisation is suspected, measurements of population samples of at least 15 of each of the parents and putative hybrids should be recorded.

Key characters

G. campestris: Annual or biennial 2-35 cm tall, with or without basal rosettes and/or cotyledons at flowering. Internodes 1-6(-7). Flower parts usually in fours, sometimes in fives. Corolla (12-)15-30(-33) mm, usually 1.1-2(-3) times as long as the calyx, pinky-purple. Calyx 6-18(-21) mm long, with distinctly unequal lobes, the narrowest c. 1 mm wide, linear-oblong, and the broadest 5-8 mm wide, ovate (Figure 6).

G. uliginosa: Annual (1.5-)3-16(-27) cm tall, with basal rosettes usually present at flowering, cotyledons still often present on smaller plants. Internodes 0-2(-4), the terminal internode usually forming 50% or more of the total internode lengths. Stem leaves (6-)8-29(-32) mm long x 2-10(-15) mm wide, ovate to lanceolate, usually (1.9-)2.0-4.7(-6.0) times as long as wide. Flowers (1-)2-6(-30), usually on long pedicels. Flower parts usually in fives, sometimes in fours.
Corolla (8-)12-20(-23) mm, usually (1-)1.2-2.0(-2.9) times as long as the calyx, pinky-purple. Calyx (5-)7-18(-25) mm long, usually with distinctly unequal lobes, the narrowest 0.5-1.5 mm wide and the broadest (1-)1.5-3 mm wide, often out-curved in flower and sometimes enlarging markedly in fruit (Figures 3 and 4).

Figure 3. *G. uliginosa*, calyx

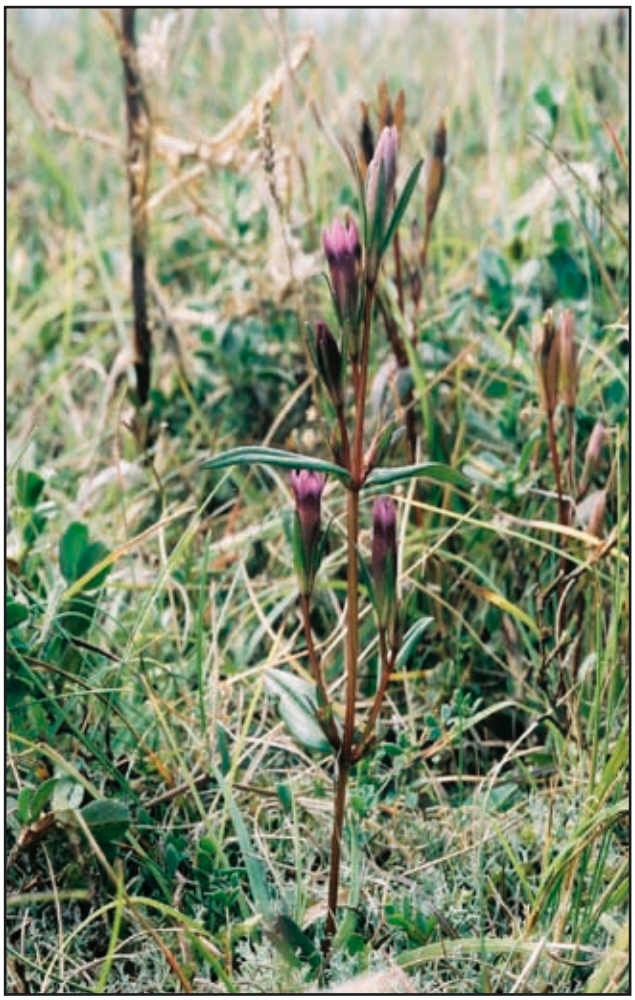

Figure 4. *G. uliginosa*, habit

Gentianella campestris & G. uliginosa cont.

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Differentiation from similar species

For identification it is often best to take averages of at least 5 and preferably 15 plants.

1. Calyx with 2 opposite lobes 5-8 mm wide, ovate and very much broader than the other 2 lobes which are c. 1 mm wide and ± linear-oblong (Figure 1a and 6). ***G. campestris***
1. Calyx with 4-5 lobes of approximately the same size, up to 3mm wide (Figure 1b,c). 2

2. Flowers (15-)21-30(-35) mm long, funnel-shaped; middle stem leaves broad, (0.45-)1.6-3.1(-4.2) times as long as wide. A biennial to 40 cm tall of chalk grassland with 7-12 pairs of stem leaves, mostly in the Chilterns, easily distinguished by the large flowers. ***G. germanica* (Willd.) Börner**
2. Flowers 10-19(-20) mm long, tube-shaped; middle stem leaves narrow, 2 or more times as long as wide. 3

3. Stems with 5-10(-14) pairs of leaves above the basal rosette; terminal internode typically forms 20% or less of the total internode lengths. Biennial to 30 cm, characteristic of sand dunes chalk and limestone grassland throughout the British Isles. A variable species, flowering from July onwards (Figure 5). ***G. amarella* (L.) Börner**
3. Stems with 0-3(-4) pairs of leaves above the basal rosette; terminal internode (when present!) 40% or more of the total internode lengths. 4

4. Calyx lobes nearly equal and ± appressed to corolla; stems with 1-3(-4) pairs of leaves above the basal rosette. Locally abundant on dry open limestone grassland and dunes in southern England, rarer elsewhere. Closely related to *G. amarella* and probably derived from it. ***Gentianella anglica* (Pugsl.) E. F. Warb.**
4. Calyx lobes unequal and often spreading away from corolla; stems with 0-2(-4) pairs of stem leaves above the basal rosette. ***G. uliginosa***

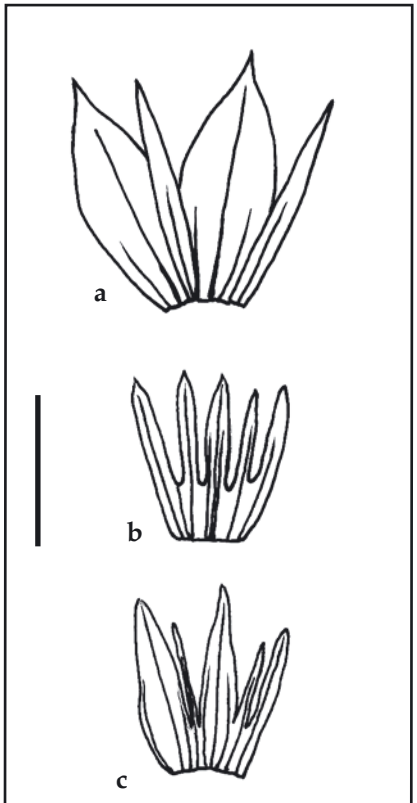

Figure 1. Shape of opened out calyxes. Scale bar = 1 cm.
a *G. campestris*; **b** *G. amarella*; **c** *G. uliginosa*.

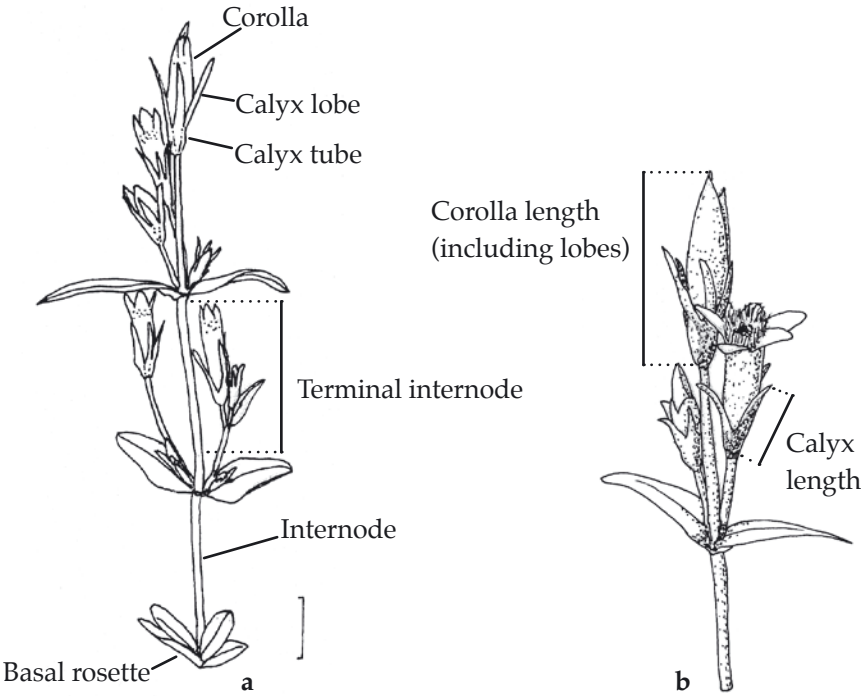

Figure 2. Parts of a *Gentianella* plant to measure.
a Whole plant. **b** Detail of flowers.

Figure 5. *G. amarella*, habit

Figure 6. *G. campestris*

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Additional photographs are available on the ARKive website (http://www.arkive.org/species).