

THE HABITATS AND DISTRIBUTION OF *GENTIANA ULIGINOSA* WILLD.

By J. E. LOUSLEY.

This species was first accurately recorded from Britain by the late H. W. Pugsley in 1924 from near Tenby, and his account includes an excellent description of the plant. In 1948 two additional records were published from the Gower Peninsula (Lousley, 1948; Wallace, 1948) but all others seem to be definite errors or doubtful (see below). Very few botanists had seen the plant growing in Britain and little was known of its habitats. I therefore arranged a visit to South Wales in the company of D. McClintock in August and September 1948 with a view to obtaining more information, and the following notes embody our observations.

Gentiana uliginosa has been recorded from Britain as follows:—

- V.-c. 45, Pembrokeshire; damp sandy pasture near Tenby, Pugsley (1924). After a lengthy search based on hints from the late Mr Pugsley, it was seen here in one small dune slack in which the dominant species was *Salix repens* (*sensu lato*). Other closely associated plants were *Linum catharticum* L., *Rubus caesius* L., *Hydrocotyle vulgaris* L., *Anagallis tenella* Murr., *Samolus Valerandi* L., *Mentha aquatica* L., *Prunella vulgaris* L., *Epipactis palustris* (L.) Crantz, and *Juncus acutus* L. (one clump). The habitat was clearly very damp, and the gentian grew in dense vegetation. No *G. axillaris* (F. W. Schmidt) Rchb.* was observed in the immediate vicinity and only 8 plants of the rarity were seen, although owing to the extreme difficulty of detecting them there may have been others in younger condition. No really similar habitat was noticed during a long search and observations by J. E. Arnett following Pugsley's discovery suggest that it may be restricted to a single spot where it varies considerably in quantity from year to year. The present dense vegetation in the slack must be a handicap to its growth.
- [V.-c. 44, Carmarthen; in this county there are large stretches of coastal dunes which are likely to offer suitable habitats for the species. We searched the coast near Pembrey unsuccessfully but in view of the known distribution further investigation is desirable.]
- V.-c. 41, Glamorgan; the history of the two records for this county is as follows:—

*This name is used here in place of *G. Amarella* L. for the reasons given by Pugsley (1936, *J. Bot.*, **74**, 165).

(a) Fresh material of a gentian was sent to me in August 1927 by Miss Violet Peel for identification and as they proved puzzling, the specimens were preserved in my herbarium. In December 1946 I realised that they were *G. uliginosa* and obtained Pugsley's confirmation. The specimens were vaguely localised as "Gower Peninsula" (Lousley, 1948) but fortunately Miss Peel had passed on my comments to Miss Vachell, together with certain information about where she had found the plant. We made two visits to the dunes at Oxwich and eventually found the gentian at a spot which agreed closely with her description of 20 years earlier. The habitat was an apparently dry dune slope with little vegetation except a few fronds of *Pteridium aquilinum* (L.) Kuhn extending up the slope from denser growth below, and a few tufts of *Festuca ovina* L. It differed conspicuously from the Tenby habitat and in a place less than 100 yards away which, from our previous experience, we regarded as obviously suitable, no trace of the plant could be found. About 60 plants were seen at Oxwich.

(b) In 1934 the late A. L. Still collected specimens from Llanmadoc, Gower, which remained unrecognised in E. C. Wallace's herbarium until about the end of 1946 (Wallace, 1948). It happened that the writer was aware of the route taken by Still on his visit to Llanmadoc and after several hours spent searching the dunes the plant was found by Miss E. Vachell who accompanied us on this part of our trip. The habitat here was much more like the one at Tenby though slightly drier. *Salix repens* was abundant. It was clear that *G. uliginosa* did not favour the lowest and dampest ground. The colony included at least 30 plants. The interesting feature of this locality was the abundance of *G. axillaris* which even grew mixed with *G. uliginosa* but was distinguishable at a glance by the stouter habit and shorter peduncles as well as the characters of the cotyledons, branching, leaf-shape, and calyx segments. In addition there was a slender form of *G. axillaris* in wetter places which somewhat simulated *G. uliginosa* in general appearance but was easily separated by the characters given above.

Thus in all three known British localities *G. uliginosa* is in very small quantity, apparently restricted to an extremely limited area (about 8 square yards in each case), and grows in dune slacks, though its water requirements vary.

The erroneous or doubtful British records are as follows:—

[V.-c. 57, Derbyshire (Smith). 65, N.-W. York; Richmond (leg. ?). 90, Forfar; Arbroath (leg. ?). Given for these three counties (as stated) by Wettstein, but there is no further evidence of its occurrence there.]

- [V.-c. 96, Nairn; a short mile east of Nairn, 1899, Marshall (2171). Pugsley (1924) pointed out that specimens of this gathering in Herb. Mus. Brit. are an annual form of the *Campestris* group and not of the *Amarella* group to which *G. uliginosa* belongs.]
- [V.-c. 107, E. Sutherland; Golspie, 1913, G. C. Druce, teste Lindman. The two specimens on the sheet of this gathering in Herb. Druce are *G. septentrionalis* Druce. Nyman (1881) includes Scotland in the distribution of the species and this record, together with Marshall's erroneous one from Nairn, was repeated by Trail (1906).]

The distribution in *Comital Flora* should be corrected to:—41, 45. [57, 65, 90 doubtful; 96, 107 errors.]

The headquarters of *G. uliginosa* are North Germany from the Friesian Islands to East Prussia. Here the plant occurs in the form illustrated in Reichenbach (1823) and by Wettstein (1896), which agrees closely with our specimens from South Wales. It extends south to Silesia, Bohemia, Moravia and Thuringia. To the north the species is found in Denmark, south Sweden and Norway, but in the latter country as illustrated by Lid (1944), and in Sweden, to judge from herbarium material, it is represented by a plant of very different habit. In recent years it has been recorded from almost the whole length of the Dutch coast (Sloff, 1942) and there probably agrees with the typical North German material (cf. Heukels, 1925, t. 110, 9, as *G. Amarella*). There are records for France and Belgium, but I have seen no specimens.

The known British distribution is not at all what one would expect from this. The occurrence of the species on the east coast of England (or perhaps Scotland) would fit in with its European range and the plant should be searched for in likely habitats. In this connection it should be noticed that although many of its foreign localities are in slacks of coastal dunes it is not restricted to such places but is also found in damp meadows and other spots where conditions are wetter than in the usual habitats of *G. axillaris*. The South Wales localities are outliers as also are the French (if the plant from them is correctly named). But until further British stations of a different kind are discovered the entry "Moist grassy places" in *Comital Flora* should be corrected to "Dune slacks."

The relationship of the annual *G. uliginosa* to the over-wintering *G. axillaris* has been compared by Murbeck and others to that between *G. baltica* and *G. campestris*. The comparison cannot be applied here as much of the British "*G. baltica*" is merely a short-lived annual state of *G. campestris* which is not identical with the *G. baltica* of northern Europe. It can, however, be said from observations in South Wales that *G. uliginosa* is unlikely to be a mere annual state of *G. axillaris*. The characters hold good even when the plants grow intermixed—as at Llanmadoc. There, as at Kenfig, there were large areas where *G. axillaris* abounded in dune slacks favourable to production of annual states

where no *G. uliginosa* could be found. The conclusion suggested by our observations is that the latter is a good species and is quite easily distinguished by the characters given by Pugsley.

The material on which this note is based was exhibited at the meeting of the Society on October 29, 1948.

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