



## Carex Aquatilis, Wahlb. And Its Scottish Forms

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great profusion, while near the end of the rotation of the shrubs it flowers comparatively little and is much less obvious, but responds quickly at any place where there is an increase of light—such as along paths, etc.

With regard to all three factors *P. vulgaris* is much less exacting and has a much wider range of habitats in consequence. It seems very indifferent to lime unless the amount rises too high, as above the chalk, and can flourish in quite non-calcareous soils.

Wherever the two species occur in close proximity hybrids occur in large quantity. These hybrids seem to have a slightly wider range of soil conditions than *P. elatior*, but not nearly so much as *P. vulgaris*. With regard to water content they seem able to flourish in soils too dry for *P. elatior*. But on this point further investigation is necessary.

To summarise, *P. elatior* demands a soil with high water content, especially in spring, but not a saturated soil. This must be combined with a moderate but not excessive amount of lime. Where either of these conditions is unfulfilled, it ceases to flourish and *P. vulgaris* occurs alone, which makes much less demand on the soil.

Other factors certainly come into play in determining the distribution, but in the eastern county woods the above seem the most important.

The flowering season of *P. elatior* is very short; it starts a week or more later than *P. vulgaris* and ceases a considerable time before, and how far this character influences the distribution would make a very interesting study.

CAREX AQUATILIS, WAHLB., AND ITS SCOTTISH FORMS. By ARTHUR BENNETT, F.L.S.

*C. aquatilis*, Wahlb., in "Vet. Akad. Handl." (Stockholm), 1803, p. 165.

Richter<sup>1</sup> quotes it as of "Act. Holm.," but the other reference is more easily found.

He gives under it four varieties, but of these *nardifolia*, Wahlb. *l.c.*, belongs to *C. Goodenovii*, Gay, as authentic

<sup>1</sup> "Plant. Europ." i. (1890), p. 155

specimens from Wahlenberg in Boott's herbarium at Kew show.

The first record of *aquatilis* as a Scottish plant was in "Eng. Botany," suppl., t. 2758 (1832): "Found on the Clova range of mountains by W. J. Hooker, W. S. Burchell, and R. K. Greville" (about 1824).

The description was by Dr. Greville, and I have specimens gathered by him in 1831. In Hooker's "Brit. Flora" (1830), p. 398, it appears as *C. rigida*, Good., var.  $\beta$ . In the 3rd ed. (1842), 427, he quotes Boott's doubts as to its being the plant intended by Wahlenberg; but now no doubt is felt, and I have myself seen specimens named by Wahlenberg.

In the year 1851 Mr. J. M'Laren read a paper, "Remarks on some British Carices," before this Society, which was also published in the "Botanical Gazette," iii. (1851), pp. 17-27.

In this he suggests three varieties of *C. aquatilis*, but gives them no names. His  $\gamma$  is the nearest we possess to the type plant of Wahlenberg; the habitat he gives is "Glen Isla, and by the bridge at Clova." His  $\beta$  is the Clova tableland plant, and his  $\alpha$  comes in between them.

This *Carex* is now known from twenty-three Scottish counties, ten Irish counties, two English counties, and one Welsh county. Yet, in 1860, Hooker and Arnott, in their "British Flora," give only the stations of "the Clova tableland, and in the valley by the bridge at Clova."

One of the most interesting facts with regard to its distribution in Britain is its occurrence in Wales, and Kerry in Ireland, at low levels; yet it is not on record for either Denmark or North Germany. In one of its forms (*C. stans*, Drejer) it extends in Greenland north to 72° N. lat. In Finland it occurs in both Finnish and Russian Lapland to 68° N. lat., and to Nova Zembla.

Though I have tried, it seems impossible to specifically separate our lowland plants from the high northern forms.

In the "Journal of Botany" for June and July 1897, I gave five forms as occurring in Scotland:—

1. var. *cuspidata*, Læstad.
2. „ *virescens*, Anders.
3. „ *minor*, Boott.
4. „ *elatior*, Bab.
5. „ *epigejos*, Læst. non Fries.

No. 1, *cuspidata*, Læst., in "Vet. Ak. Hand." (1822), p. 339. —This is now regarded as a hybrid = *C. aquatilis* × *salina cuspidata*, and I see no reason to doubt this may be so with the Caithness plant, *i.e.* *C. aquatilis* × *kattegatensis*, Fr.; it occurs with the parents on the Wick river, where it was gathered by Mr. Grant.

As I remarked (*l.c.*), I find it difficult to separate it from Læstadius's var. *subacuta* in "Nov. Act. Upsal.," xi. (1839), 289.

As the name *cuspidata* implies, the glumes are drawn out into a long cuspidate point.

2. Var. *virescens*, Anders., "Cyp. Scand." (1849).—Exactly the opposite to the last, the glumes only half the length of the fruit, and the fruits very symmetrically arranged. Perth, B. White!; Spittal of Glen Shee, E. Perth, E. S. Marshall, sp.; Spey bank, Aviemore Co., 96, Messrs. Wilson and Wheldon, 1909; W. Sutherland, E. S. Marshall, sp., Co. Donegal, Hart, sp.; Co. Limerick, Phillips, sp.

3. Var. *spagnophila*, Anders., *l.c.*—He quotes Fries, "Sum. Veg. Scand.," pp. 72, 220, but there is no description there; and "Herb. Nor.," xi., No. 78: "culmo pedali obtusanguli; foliis culmum æquantibus, fructibus squamas acutas pallidas æquantibus; pur viridis."

Swamps on the tableland between Glens Doll, Caness, and Fiagh frequent, 27/6/1904, E. S. Marshall, sp.

4. Var. *elatior*, Bab.! "Man. Brit. Bot." (1843), p. 341: "3-4 feet high, glumes oblong, blunt, shorter than the fruit." = var. *Watsoni*, Syme, "Eng. Bot.," 3rd ed., x. (1870), 113.

Some years ago Professor Babington wrote me that "I do not now consider that this is worth a name." Anyhow, it is the largest form we have, and sometimes comes near the original type.

5. Var. *epigejos*, Læst., "Vet. Akad. Hand." (1822), 339 = *C. epigejos*, Hartm. non Fries:—"culmo subpedali, superne scabro; foliis planis, strictissimus; bracteis spicim masculum subæquantibus, spicis fem. subrariflorus oblongis, fructibus flavoviridibus, squamis fusco-atris fere brevioribus fusco-viridis." Anders., *l.c.*

In the paper cited I noted that Dr. Almquist had named specimens from Methven Bog, Perthshire, as *C. epigejos*.

I there remarked that I doubted this naming, and it has proved a form of *Goodenovii*.

Specimens gathered by the Rev. E. S. Marshall: "By the Spey, below Kingussie, v. c., 96, 1898." On these Herr Kükenthal remarked, "approaches var. *epigejos*, And."

In the "Ann. Scot. Nat. Hist." (1910), p. 50, it is stated that Herr Kükenthal<sup>1</sup> makes *epigejos* synonymous with *C. stans*, Drejer. "Rev. Car. Bor.," No. 32 (1841), p. 458. Drejer there says: "Hæc species, cujus perigonia modo immatura vidi, ex distylis *C. aquatili* et *saxatili* (*rigida*, Good.) maxime affinis est." Now Hjelt in his "Fl. Fennica" 1895), 270, remarks that Drejer's plant passes for three:—

1. *C. aquatilis* × *rigida*.
2. A small form of *aquatilis*.
3. The arctic *C. stans* of Greenland.

To me Mr. Marshall's specimens belong to No. 2. Neither Richter, *l.c.*, nor Nyman<sup>2</sup> mention *C. stans*.

6. Var. *forma angustata*, Kük. *l.c.*—From Forfar (Somerville) and East Inverness (Marshall). I have specimens of both these, and how they are to be separated from No. 3 puzzles me. Marshall rightly observes, when these were called *f. gracilis*, "I do not think these are really worth separating."

7. Var. *rigidis*, A. Benn., "Ann. Scot. N. Hist.," Linlithgow; A. Sommerville, sp., 1897.

Kirkcudbright: (1) the Dam, New Galloway, 1887, J. M'Andrew, sp. (2) Kenmore Holms, New Galloway, 1887, J. M'Andrew, sp. (3) River Ken, New Galloway, 1884, J. M'Andrew, sp.

In this the male spikes are 2–3, thick, rigid, and adpressed to the stem; female spikes 3–4, stout, continuous, the fruit closely packed, glumes with upper spikes subequal, in the lower often exceeding the fruits, edged with rich brown; middle (broad) green. Stems 2–3 feet high, leaves broad, almost flat, edges very slightly involute.

The habit is much like some *salina* forms, or like a rare Portuguese species, *i.e.* *C. fasciculata*, Link. The stigmas are very long, 3–4 times that of the fruit.

<sup>1</sup> In Engler's "Das Pflanzenreich," *Carex*.

<sup>2</sup> "Consp. Fl. Europ." (1882), 777.

## HYBRIDS.

8.  $\times C. hibernica$ , Ar. Benn., "Jour. Bot.," June (1897) =  $C. aquatilis \times Hudsoni$  (*stricta*, Good.), Ireland.—Galway's river, Old Kenmore Road, Co. Kerry, 15/6/1889, R. W. Scully.

9.  $\times C. Grantii$ , Ar. Benn, *l.c.* =  $C. aquatilis \times (salina) kattegatensis$ .—By the Wick river, Caithness. J. Grant, sp. 1884. C. L. Marshall, sp., 1900.

10.  $C. aquatilis \times rigida$ . — Sphagnum swamp (2000 ft. alt.) with the parents below corrie of Clova, Forfar, 1904. C. S. Marshall, Lochnagar, Aberdeen, 1851; J. F. (Boswell) Syme, sp.

11.  $C. aquatilis \times Goodenovii$ .—Caness, Forfar; F. W. Miller, sp., 1884; near Spittal of Glen Shee, East Perth; E. S. Marshall, sp., 1906.

The figure of *aquatilis* in "Fl. Danica" supp., t. 33 (1852), seems to come between No. 3 and 4.

In Don's "Herbarium Britannicum," fas. 8 (1806), No. 192, are specimens of the var. *elation* of Babington, under the name of *C. stricta*, var.—new species—*Carex*, perhaps only a variety of *stricta*. He says: "I have seen this *Carex* in several places in Scotland, but it is of the rarer species. My specimens were collected from the side of the river Esk, near Eskmount, three miles from Brichen, in Angusshire."

In the "Comp. Cybele Brit." (1870), 589, Mr. Watson mentions that Dr. Boott made out other affinities with forms of *aquatilis*, writing, "in the specimens from the Almond river (near Edinburgh) collected by Professor J. H. Balfour in September 1838, very like *stricta* (Lam.) of America." Thus the *C. Virginiana* of Smith is placed next to *aquatilis* by Bailey;<sup>1</sup> and certainly some of the forms of *aquatilis* do come near to that very variable American species.

<sup>1</sup> "Proc. Am. Acad. Arts and Sciences" (1886), p. 84.