

Notes

NEW COMBINATIONS IN BRITISH ALIEN GRASSES

During the course of preparation of a checklist of alien grasses in the British Isles, T.B.R. came across two species that lacked combinations in the genera to which they are currently assigned (in part following Clayton & Renvoize 1986). With the help of T.A.C., the appropriate generic affinities were confirmed and the required new combinations are set out below.

***Ceratochloa sitchensis* (Trin.) Cope & Ryves, comb. nov.**

BASIONYM: *Bromus sitchensis* Trin., *Mémoires de l'Académie Impériale des Sciences de St.-Petersbourg. Sixième série. Sciences mathématiques, physiques et naturelles* 2: 173 (1832).

HOLOTYPE: Alaska, K. H. Mertens (LE, n.v.).

Native of North America (Alaska to Oregon).

The generic name *Ceratochloa* is adopted here in order to conform to generic concepts in Stace (1991). Acceptance of the name at generic rank is, however, at variance with other modern treatments which either prefer the taxon at a lower rank (e.g. Hitchcock (1951) and Clayton & Renvoize (1986) who opt for a section of *Bromus*) or do not recognize it as distinct at all (Watson & Dallwitz 1992).

***Helictotrichon recurvatum* (Swallen) Cope & Ryves, comb. nov.**

BASIONYM: *Amphibromus recurvatus* Swallen, *American journal of botany* 18: 415 (1931).

HOLOTYPE: Tasmania, R. A. Black 1225 (US).

Native of Australia (Tasmania, Victoria and South Australia).

REFERENCES

- CLAYTON, W. D. & RENVOIZE, S. A. (1986). *Genera graminum*. H.M.S.O., London.
 HITCHCOCK, A. S. (1951). *Manual of the grasses of the United States*, 2nd ed. United States Department of Agriculture, Washington DC.
 STACE, C. A. (1991). *New Flora of the British Isles*. Cambridge University Press, Cambridge.
 WATSON, L. & DALLWITZ, M. J. (1992). *The grass genera of the world*. C.A.B. International, Wallingford.

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CYSTOPTERIS DICKIEANA R. SIM IN THE CENTRAL AND EASTERN SCOTTISH HIGHLANDS

Cystopteris dickieana R. Sim was reported in the last century from several inland Scottish localities but very few of these records have been confirmed. The only recent Scottish records have been from coastal sites very near the type locality in Kincardines., v.c. 91, although, based primarily or solely on the single character of its distinctive spore type, it has been reported recently from several localities on the Continent, in North America and China.

In July, 1992 I discovered *C. dickieana* in Mid Perth, v.c. 88, where it had been previously recorded (see below), and in July, 1993 in Easternness, v.c. 96, from which there were no previous

records. The Perthshire plants differed morphologically from *C. dickieana* from the type locality although they were also more distinct from typical *C. fragilis* (L.) Bernh. than many of the Continental specimens which have been referred to *C. dickieana*. In July, 1995 I discovered a second site for *C. dickieana* in Mid Perth, v.c. 88.

SCOTTISH RECORDS OF *C. DICKIEANA*

The records of *C. dickieana* from coastal sites in Kincardines., v.c. 91, including those from the type locality, have been well described by Marren (1984). Dickie's Bladder-fern was first discovered there by Professor William Knight prior to 1838 and shown by him to George Dickie. The first published reference to its locality appeared in G. Dickie's *Flora Abredonensis* (1838) and the type gatherings, made by Dickie in 1842, are in **BM** and **K**. Many of the old records from other parts of Scotland are less certain as several of the specimens have not been traced and only a few of the old specimens have been confirmed recently, but they include the following:

Mid Perth, v.c. 88 (Herbarium specimens)

Ben Lawers, R. Brown, August 1794, **BM**

Ben Lawers, "Sent to W. Wilson" July 1827, **MANCH**. Confirmed A. C. Jermy.

Ben Lawers, Collector not known, 1842, **E**. Determined D.J.T.

Above Loch Tay, GR NN/6.3, D. J. Tennant, 18 July 1992, **herb. D.J.T., E, BM**. Determined A. C. Jermy.

Glen Lyon, west of Aberfeldy, GR NN/7.4, D. J. Tennant, 24 July 1995, **herb. D.J.T., E, BM**. Confirmed R. H. Roberts.

Mid or East Perth, v.c. (?) 88 or 89 (References in literature and herbarium)

West of Dunkeld, G. Dickie, pre 1860 (Dickie 1860: 229). Unconfirmed.

North of Dunkeld, G. Dickie, pre 1882 (Boswell-Syme 1886: 105). Unconfirmed.

Near Dunkeld, J. H. Balfour, pre 1860 (Lowe 1876: 430). Unconfirmed.

Dunkeld, C. McIntosh, undated (1838–1922) **PTH**. (?) Unconfirmed.

Easternness, v.c. 96

Western foot of Cairngorms, GR NH/8.0., D. J. Tennant, 19 July 1993, **herb. D.J.T., E, BM**, determined D.J.T., confirmed R. H. Roberts.

There are two additional unconfirmed references. The first occurs in the correspondence of Charles Cardale Babington dated 1876 (Babington 1897) where, in referring to specimens sent to him by James Backhouse junior, he suggests that Backhouse had collected *C. dickieana* in a native mountain locality (presumably Scottish). However, he does not give the location. The spore characters were mentioned by Babington, therefore his determination would almost certainly have been correct. If Backhouse's correspondence for this additional record can be traced this would reveal the location. Secondly, Moore (1860: 266) states that specimens from "the Great Isle of Arran, Galway" in Ireland, collected by D. Moore, "appeared to be identical with" (plants from the type locality). No further references or specimens for either of these reports have been traced. However, Page (1988: 334) states that plants which may be *C. dickieana* occur "in at least one current alpine site on Skye," v.c. 104.

As *C. dickieana* had not been recognised at the time of the earliest Perthshire gathering (1794), coupled with the fact that the Perthshire plants differ morphologically from the type form, there is no possibility that it had been deliberately introduced there. Specimens of *Cystopteris* which I gathered near Dunkeld in E. Perth, v.c. 89, in 1991 and near Tomintoul in both Banffs., v.c. 94, and Elgin, Moray, v.c. 95, in 1993 had a similar frond morphology to *C. dickieana* from Loch Tay but had the echinate spores of *C. fragilis* (Fig. 1).

HABITAT OF *C. DICKIEANA*

In Mid Perth, v.c. 88, *C. dickieana* was found in good quantity extending for about 2 kms throughout a rocky stream-gorge between altitudes of about 140 and 380 m, often beneath overhanging rocks in deep shade. No detailed geological examinations were made but both Loch Tay limestone and basic schistose rocks occurred in the immediate area. Few other plants were present, but locally *C. dickieana* was accompanied by *Asplenium adiantum-nigrum* and *Polystichum*

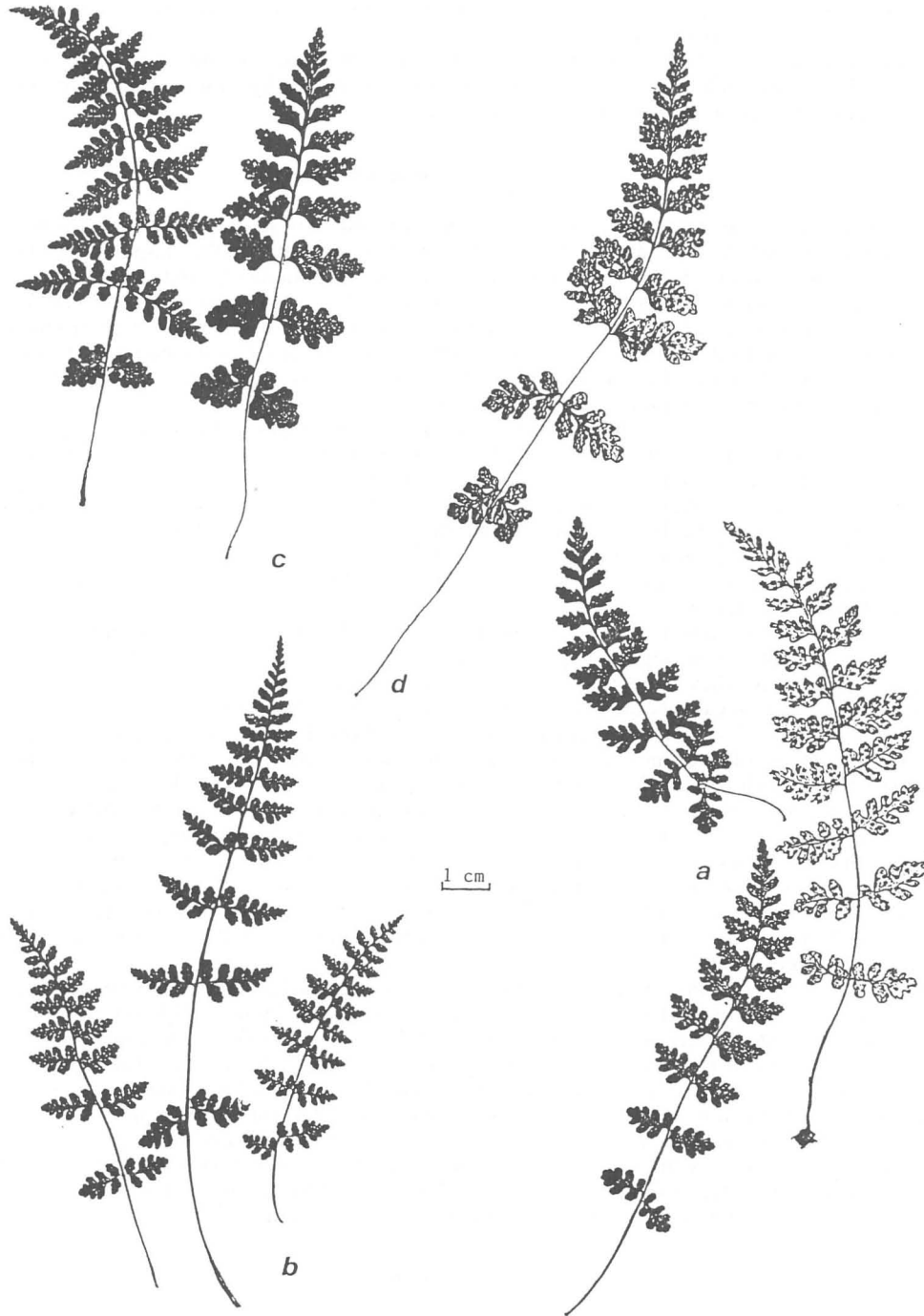


FIGURE 1. *Cystopteris dickieana*: a. Loch Tay, Mid Perth (v.c. 88); b. Cairngorms, Easternness (v.c. 96). Unusual *C. fragilis*: c. Dunkeld, E. Perth (v.c. 89); d. Near Tomintoul, Banffs. (v.c. 94).

hum aculeatum; however, in close proximity and probably in more acidic conditions, *Gymnocarpium dryopteris*, *Phegopteris connectilis*, *Athyrium filix-femina*, *Dryopteris filix-mas* agg., *D. dilatata* and *Blechnum spicant* were present.

In Easternness, v.c. 96, *C. dickieana* also occurred in a rocky stream-gorge, and was here growing on hard schistose rock with other calcicole species occurring nearby. It was also present on an old wall in the same area, in both cases in small quantity.

MORPHOLOGY AND SPORE CHARACTERS

The plants in the Loch Tay populations of *C. dickieana* differ from those from the type locality in their pinnae which were not crowded and did not overlap, neither were the margins crisped nor was the stipe short. However, in comparison with *C. fragilis*, the pinnule segments were broader, more rounded and much less dissected than is usual, all characters found in the type *C. dickieana*. Fig. 1 shows the silhouettes of specimens of *C. dickieana* and also the somewhat untypical forms of *C. fragilis* from Dunkeld and near Tomintoul. Another feature of some of the plants in the Loch Tay population which occurred in the deepest shade was the thin texture of their fronds which were pale in colour and sometimes almost semi-translucent.

A further character which the Perthshire and Easternness populations share with *C. dickieana* from the type locality is that the majority of the veins of the pinnule segments terminate in a sinus, notch or shallow depression, whereas in *C. fragilis* the veins nearly always terminate at the pointed apex of the teeth. Babington (1904) used this character to separate *C. dickieana* and *C. fragilis* var. *alpina* Desv. (var. *alpina* Hook.) from other forms of *C. fragilis*, and it was also used similarly by Boswell-Syme (1886). I have found, however, that this character is not always reliable in that certain forms of *C. fragilis* which, even though fully fertile, can exhibit this character when the fronds have not attained their full size.

Spores were examined from over 20 individual plants gathered throughout the entire range of the Loch Tay locality, including a few plants which appeared to be closer to typical *C. fragilis*, and without exception they were found to match those of the type *C. dickieana*. R. H. Roberts commented that they were exactly like those of that species, without any doubt, and later made the same comment following his examination of specimens from the Easternness population. However, some specimens collected more recently from a selected area within the Loch Tay locality have been shown to have echinate spores, confirming that *C. fragilis* is also present there (S. Lindsay, pers. comm.). R. H. Roberts commented that the surface of the perispore had no spiny projections, only low ridges, possibly caused by folds in the perispore, and that the perispore fitted loosely around the exine. Spore samples from the Loch Tay population were measured by R. H. Roberts and compared with those of *C. dickieana* from the type locality and with several varieties of *C. fragilis*. The mean spore lengths (exospore) of the *C. dickieana* samples were very similar (Loch Tay 43 μ m: Type locality 44 μ m). Full details of these measurements and the method used has been published elsewhere (Tennant 1995).

The discovery of *C. dickieana* in three localities in the Scottish Highlands in two widely separated areas in such a short period of time strongly suggests that it will be found in additional localities there once a more routine check is carried out on spores following fieldwork. *C. dickieana* occurs in good quantity in the Loch Tay locality and is generally not under threat there. At the Cairngorms locality in Easternness it is very local and in rather small quantity and therefore is more vulnerable here. Details of records and localities have been deliberately abbreviated for conservation reasons, although *C. dickieana* is a fully protected species under the *Wildlife and Countryside Act* (1981). After its identity had been established, some of the specimens used during the preparation of this paper and others which were donated to BM, E and the University of Edinburgh were collected under a special permit kindly provided by Scottish Natural Heritage.

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REFERENCES

- BABINGTON, A. M., ed. (1897). *Memorials journal and botanical correspondence of C. C. Babington*, p. 376. Macmillan & Bowes, Cambridge.
- BABINGTON, C. C. (1904). *Manual of British botany*, 9th ed., p. 527. Gurney & Jackson, London.
- BOSWELL-SYME, J. T. I., ed. (1886). *English botany*, 3rd ed., **12** (*Cryptogamia*): 101–106. Bell, London.
- DICKIE, G. (1838). *Flora Abredonensis*, p. 59. Avery, Aberdeen.
- DICKIE, G. (1860). *Botanist's guide to the counties of Aberdeen, Banff and Kincardine*. A. Brown, Aberdeen.
- LOWE, E. J. (1876). *Our native ferns* **2**: 423–434. G. Bell, London.
- MARREN, P. (1984). The history of Dickie's Fern in Kincardineshire. *Pteridologist* **1**: 27–32.
- MOORE, T. (1860). *British ferns*, the octavo nature printed ed., **2**: 254–268. Bradbury & Evans, London.
- PAGE, C. N. (1988). *Ferns*. Collins, London.
- TENNANT, D. J. (1995). *Cystopteris fragilis* var. *alpina* Hook. in Britain. *The naturalist* **120**: 45–50.

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