

Dickie's Bladder – fern inland in Banffshire (v.c. 94).

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*Cystopteris dickieana* (Dickie's Bladder – fern) has long been known from sea caves and adjacent cliffs in Kincardineshire (vc91) (Marren 1984, Jermy 1999). These were the only known extant sites in the British Isles until Tennant (1996) reported finds from inland areas of Highland Scotland in Mid Perth (vc88) and Easternness (vc96). He commented in his paper that more sites would likely be found once spores of *C. fragilis* (Brittle – Bladder fern) like plants were more routinely checked under a microscope; the only certain difference between the two species being the spinose spores of *C. fragilis* cf. the rugose spores of *C. dickieana*.

On 19 August 2001 I found what I took to be *C. fragilis*, growing on the sides of an old stone bridge at a site c.40 kms inland in Banffshire, vc94, at 200 metres ASL. As I had never looked at the distinctive spores of this species under a microscope before I collected a single pinna. I was therefore (pleasantly!) surprised to find that the spores were not spinose, but were instead rugose, and apparently a good match for *C. dickieana*.

Being aware of the earlier records made by Tennant, I revisited the site the next day. c70 clumps of *Cystopteris* were counted, growing on the vertical stonework on both sides of the bridge (aspect c. north and south). No *Cystopteris* could be seen on the riverside natural rock outcrops below the bridge or on a second old stone bridge over the same river less than 1km away\*. The majority of plants were inaccessible but two fronds from two different clumps were collected. Both specimens had the basic morphology of *C. fragilis* but on microscopic examination had rugose spores. They were sent to Alison Paul at **BM** who confirmed the identification. The specimens are deposited at **BM** and location details have been passed on to the BSBI's Threatened Plants Database, Scottish Natural Heritage and the landowner.

Spore dimensions from the single pinna collected on 19 August 2001 were measured in November 2001. Spores were mounted in water and their maximum length measured at X400 using a calibrated eyepiece micrometer. Mean spore length was 48.8µm (range 37.7 – 54.6, n = 18). These measurements are slightly larger than those reported by Tennant (1995) and Parks et al (2000) who give mean spore lengths between 43 - 45µm (range 39 – 48). Tennant (1995) raised the possibility of spores shrinking with age and drying. A further sample of 18 spores from the same pinna were measured in July 2002, mean 44.7µm (range 36.4 – 49.4). The mean spore lengths in November 2001 and July 2002 were significantly different (t – test, p = 0.003).

The type specimens of *C. dickieana* were collected in 1842 from the classic Kincardineshire sea – cave site. Over the ensuing 160 years there has been continued debate over the taxonomic status of this species (Dyer et al 2000), particularly with the realisation that rugose spored *Cystopteris* occurred at numerous sites around the Northern Hemisphere. Recent isoenzyme studies, eg. Parks et al (2000), do not support the maintenance of *C. dickieana* as a separate species. However Dyer et al (2000) state that there are no substantiated reports of plants with rugose spores *and* the frond morphology of plants from the type location at any other site, and Jonsell (2000) confirms that such forms do not occur in Scandinavia.

Jonsell treats *C. dickieana* as a synonym of *C. fragilis*, but goes on to describe three rugose spored forms from Scandinavia; a southern form, indistinguishable from *C. fragilis*, apparently geographically separated from two forms with more northern or Arctic distributions. Jonsell describes the habitat of rugose spored plants in Scandinavia as calcareous and sometimes non – calcareous substrates, often rock shelves and crevices, *on*

warm south – facing slopes, less frequently in humid and shady places (my emphases). On the Kincardineshire coast *C. dickieana* grows in damp, cool, tide washed sea caves (Page 1988). At both the inland sites found by Tennant, *C. dickieana* grows along stream gorges, often below overhanging rocks in deep shade, though at the Easternness site it was also present on an old wall in the same area. In contrast the vc94 site is well illuminated and exposed, more in accord with the situation reported from Scandinavia.

Distinctive variation should be recorded and conserved. As a non – taxonomist I suggest that to simply subsume all rugose – spored forms within *C. fragilis* is unsatisfactory as these “*dickieana*” type plants are thought to be rare in Britain. Given that rugose - spored *Cystopteris* have now recently been found at four inland locations in the Scottish Highlands and that they are frequent in central and southern Norway, it would be well worthwhile checking the spores of any apparent *C. fragilis* in the Highlands, and not just those plants in shady or humid sites.

### References:

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### Postscript

Two additional sites for this rare fern have since been found in v.c. 94.

In August 2006, the author found a single small *Cystopteris* on the stonework of a footbridge 6 km south-west of the original site. Spore shape confirmed this as a second site for *C. dickieana*.

\*In September 2007, Stewart Taylor found at least two clumps of a *Cystopteris* on this bridge. Spores from one clump were checked, confirming the specimen as *C. dickieana*. Given the size of the larger clump, the plant(s) had probably been overlooked in 2001.

In 2007, the author found a single plant of *C. dickieana* on a bridge in v.c. 96. Collectively these finds demonstrate the value of checking spores of *Cystopteris fragilis*-like plants in NE Scotland.

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