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Riccia huebeneriana in South Lancashire

Des A. Callaghan

51 Bishopdale Drive, Rainhill, Prescot, Merseyside, L35 4QQ
DesCall@blueyonder.co.uk

Introduction

Although *Riccia huebeneriana* is a widespread plant in Europe, it is rare (Damsholt 2002) and is listed as such in the European Red Data Book (ECCB, 1995). In the UK it is scarce (Preston, 2006), being categorised as ‘Vulnerable’ in the British Red Data Book (Church *et al.*, 2001). The plant is one of eleven liverwort species that are recognised as being of principal importance for conservation in England, under Section 74 of the Countryside and Rights of Way Act 2000, and is included as a priority species within the UK Biodiversity Action Plan.

The habitat of *R. huebeneriana* is very characteristic, the plants being confined to exposed, non-calcareous soil at the edge of freshwater bodies, especially reservoirs (Paton, 1999). Other bryophytes that have been noted as growing within close proximity of this liverwort include *Aphanorhagma patens*, *Dicranella staphylina*, *Fossombronia won-draczekii*, *Leptobryum pyriforme*, *Pseudephemerum*

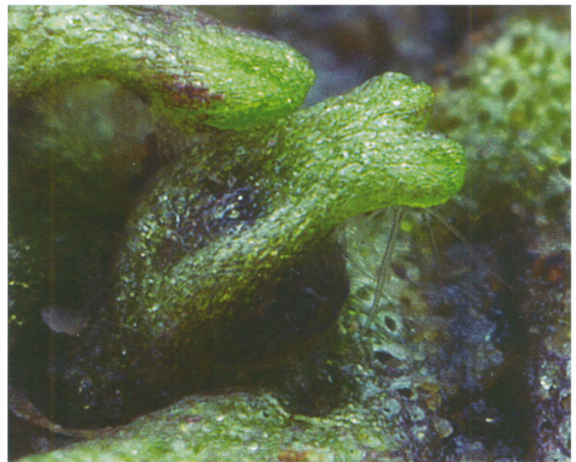


Figure 1. *Riccia huebeneriana* showing development of sporophyte on underside of thallus. Photo: Des A. Callaghan.

nitidum and *Riccia glauca* (Hill *et al.*, 1991; Holyoak, 2001, 2002).

R. huebeneriana is a classic annual shuttle species (*sensu* During, 1979, 1992), with a short lifespan and very frequent sporophytes producing an



Figure 2. The small rosettes of *Riccia huebeneriana* (foreground on bare soil). Photo: Des A. Callaghan.

abundance of large spores of low dispersal capacity. Unusually, the sporophytes are born on the underside of the thalli (Figure 1) and hence the spores are liberated directly onto the soil surface. The plant avoids high water levels as spores in the mud, waiting for the cyclic and predictable falling levels to expose the soil for the summer and autumn. Populations of gametophytes vary dramatically in size both between years and between sites, from a few thalli to, for example, millions of plants seen around a reservoir (Cwm Liedi) in southern Wales in 2002 (Bosanquet *et al.*, 2005).

Discovery of *Riccia huebeneriana* in South Lancashire

On the morning of September 16th 2006 the Bryophyte & Lichen Section of The North Western Naturalists' Union met at Anglezarke Reservoir (SD620160) for a day of recording under the

leadership of John Lowell. This large waterbody is located within a wide shallow valley running north-south along the western edge of the West Pennine Moors, built in the 1850s to supply the growing water demands of the city of Liverpool. The geology lies on the boundary between the Coal Measures and Milstone Grit series' of rocks.

On the silty margins of the reservoir I came across tiny *Riccia* rosettes (Figure 2) of a species that I did not recognize, but that clearly had a pitted ('lacunose') upper surface on the older parts of the thallose and a purple tinge to parts of the rosette (see image on front cover). Subsequent microscopic examination convinced me that this was *R. huebeneriana* and so I sent some material to Tim Blackstock and David Long, who both kindly confirmed the identification.

On October 8th and 15th 2006 I returned to the Anglezarke area and searched for *R. huebeneriana* at five other reservoirs within the general region (Yarrow, Belmont, Wards, Turton & Entwistle and Rivington). I found it only on the east bank of Rivington and in rather small amounts. Its presence here was not surprising, since it lies immediately below Anglezarke and is practically the same wetland system. I re-walked the eastern parts of Anglezarke and noted that the liverwort grew in



Figure 3. Prime habitat for *Riccia huebeneriana* at Anglezarke Reservoir. Photo: Des A. Callaghan.

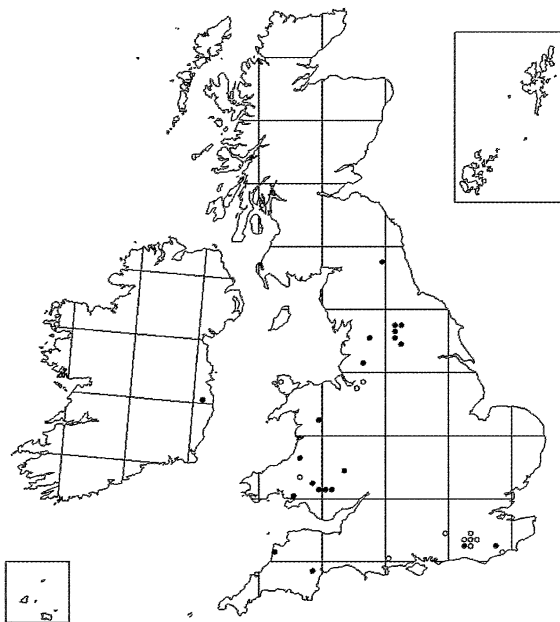


Figure 4. Distribution of *Riccia huebeneriana* in Britain and Ireland (open circles are <1970 records).

abundance for a stretch of about 3km from the northern tip of the site down along the eastern shore. The most impressive carpets were located in the north where large expanses of exposed soil were located (Figure 3).

Since 1970, the species has now been recorded from 21 10-km squares in Britain and Ireland (Figure 4). Strong-holds seem to be northern England and southern Wales. Over the past few decades it appears to have suffered a significant decline in range only in south-east England.

Quadrat data

Five sample quadrats (50x25cm) were placed over patches of *R. huebeneriana* and various measurements were recorded (Table 1). The silty soil had a mean pH of 5.6, vascular plant cover was infrequent (mean cover = 32%), bare soil was common (mean cover = 56%) and bryophytes were sparse (mean cover = 13%). The number of *R. huebeneriana* rosettes in the bottom left 10x10cm

portion of each quadrat were counted individually and then extrapolated to provide an estimate for the whole quadrat. This provided estimates of up to 2280 individuals per quadrat (Table 1), or an impressive 18,240 individuals/m², though most of these did not form robust rosettes. Considering the 3km extent of occurrence of the liverwort along the Anglezarke shoreline the total population must have numbered millions of individuals. And considering ripe sporophytes were common, a tidy number of spores must have been liberated into the Anglezarke soil.

Fifteen other bryophyte taxa were recorded from the quadrats, including *Poblia wahlenbergii* var. *wahlenbergii* and *Pseudophemerum nitidum* in all quadrats. Notable records included *Poblia bulbifera* (rare in this region), the nationally scarce *Bryum tenuisetum* and the first record of the rare tuber-bearing variant of *Pseudophemerum nitidum* in the British Isles (see the Rare & Interesting column of this issue for further details of the latter). Closer examination of the exposed-soil bryoflora of the reservoirs of the Pennines should provide further interesting finds during coming summers and autumns.

Acknowledgements

Many thanks to John Lowell for introducing me to Anglezarke Reservoir and the bryophytes of Lancashire, and to Tim Blackstock, David Long, David Holyoak and Chris Preston for confirming some of the species identifications. Thanks also to Chris for supplying the distribution map.

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Variable	Quadrat					Mean
	1	2	3	4	5	
Location (OS Grid Reference)	SD625143	SD615179	SD614178	SD614176	SD615172	
Soil pH	5.4	5.5	5.7	5.7	5.7	5.6
N° <i>Riccia huebeneriana</i> individuals	23 ¹	992 ²	2280 ²	672 ²	1096 ³	1013
% cover						
Bare soil	40	50	50	60	80	56
Vascular plants	50	28	40	30	10	32
Total bryophytes	11	22	12	9	12	13
<i>Riccia huebeneriana</i>	0.5	15	10	8	10	8.7
<i>Pohlia wahlenbergii</i> var. <i>wahlenbergii</i>	10	4	0.3	1	0.5	3.16
<i>Pseudephemerum nitidum</i>	0.2	0.5	1	0.01	0.01	0.34
<i>Bryum klinggraeffii</i>	0.01		0.1	0.01	0.1	0.04
<i>Pohlia bulbifera</i>	0.01	0.01		0.1	0.1	0.04
<i>Fossombronia wondraczekii</i>	0.01	0.1	0.1	0.05		0.05
<i>Ditrichum cylindricum</i>	0.01	0.1	0.5			0.12
<i>Atrichum crispum</i>	0.1	0.1		0.01		0.04
<i>Archidium alternifolium</i>				0.2	1	0.24
<i>Hypnum cupressiforme</i> var. <i>cupressiforme</i>				0.01	0.2	0.04
<i>Bryum pseudotriquetrum</i>		0.01		0.01		>0.01
<i>Bryum tenuisetum</i>			0.01		0.01	>0.01
<i>Ephemerum serratum</i> var. <i>serratum</i>		0.01	0.01			>0.01
<i>Dicranella rufescens</i>		2				0.4
<i>Calliergonella cuspidata</i>	0.1					0.02
<i>Pohlia campotrachela</i>	0.01					>0.01

¹ Mostly robust rosettes; ² Many small individual thalli not forming complete rosettes; ³ Equal mixtures of small individual thalli and robust rosettes

Table 1. Results of quadrat sampling of patches of *Riccia huebeneriana*

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