

## *Festuca longifolia* Thuill. (Poaceae) in Devon

R. E. N. SMITH

*Institute of Grassland & Environmental Research, North Wyke, Okehampton, Devon EX20 2SP\**

and

L. J. MARGETTS

*16 Ashleigh Road, Honiton, Devon EX14 1TD*

### ABSTRACT

*Festuca longifolia* Thuill., Blue Fescue, was first recorded in Devon on limestone at Berry Head in 1936. More recently it has been found on sea cliffs in South Devon between Start Point and Bolt Tail on both mica-schist and hornblende-chlorite schist rocks and another site on limestone near Torquay. *F. longifolia* is not an obligate calcifuge but occurs on dry soils in the absence of competition. It may be more widely distributed in the south-west peninsula of England.

KEYWORDS: fescue, distribution, habitat, geology, soil type.

### INTRODUCTION

There is some confusion over the name *Festuca longifolia* Thuill., which, especially in post-1945 Floras such as the popular *Concise British Flora in Colour* (Martin 1965), is used to describe an introduced species, the Hard Fescue. However, recent taxonomic research (Wilkinson & Stace 1989), has shown that the correct name for Hard Fescue is *F. brevipila* Tracey. Wilkinson & Stace (1991) have further shown that *F. longifolia* is not conspecific with the garden Blue Fescue, to which the name *F. glauca* Vill. correctly belongs.

The *British Red Data Book* (Wigginton 1999) shows the distribution of *Festuca longifolia* Thuill. in Great Britain and the Isle of Man to be restricted to a few sites in eastern England where it occurs on acid soils in heathland communities in Suffolk, Lincolnshire and Nottinghamshire. In fact, this species was recorded in Devon as long ago as 1936 when it was collected by G. T. Fraser at Berry Head and determined by W. O. Howarth, the acknowledged *Festuca* expert at that time. Two years later, Fraser returned to Berry Head to show the plants to three leading botanists - G. M. Ash, J. F. G. Chapple and J. P. M. Brenan. These records were included in the *Flora of Devon* (Martin & Fraser 1939) and vouchers deposited in **TOR**, **RAMM** and **Herb. Druce (OXF)**.

In 1992 R. Arigho, a local botanist with a particular interest in grasses, collected a small fescue from a rock outcrop near Prawle Point, the southernmost point of Devon. This was sent to T. A. Cope who confirmed that it was *F. huonii* Auq. This new record for the mainland of Great Britain was published locally (Margetts 1993) and nationally (Plant Records 1995). The following year, R. Arigho and L.J.M. visited the South Hams coast in search for further colonies of *F. huonii*. Near Gara Rock they found a small bluish fescue on rocks by the coastal footpath. They each collected rooted offsets to grow on in pots. When these flowered, it was realised they were not *F. huonii*, but almost certainly *F. longifolia*. The specimens were sent to T. A. Cope and P. J. O. Trist, both of whom confirmed this identification. This record was also published (Margetts 1994; Plant Records 1995). Since then, further exploration of this part of the south Devon coast has led to the discovery of *F. longifolia* at a number of sites between Start Point and Bolt Tail, and at a new station on the

\*Address for correspondence: Email: roger.smith@bbsrc.ac.uk

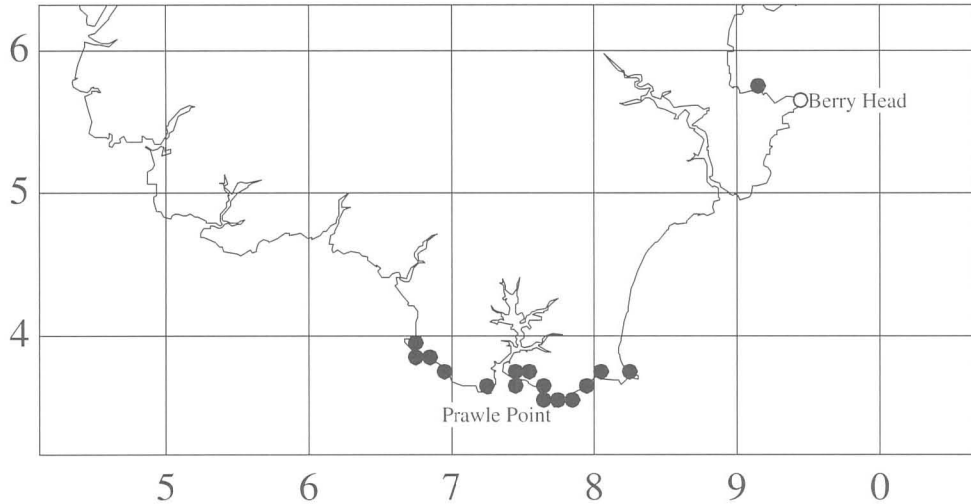


FIGURE 1. Distribution, by 1 km square, of *Festuca longifolia* (Thuill.) in Devon. The open circle represents the 1936 record from Berry Head, the closed circles the 1993 and subsequent records.

Torbay limestone (Fig. 1; Appendix 1). It still exists on Berry Head (R. Arigho, pers. comm., 1995). *Festuca huonii* has not been relocated or found elsewhere. It is possible the original specimen may have been young *F. longifolia*.

#### GEOLOGY AND SOILS

Plants growing in eastern England and the Channel Islands have all been described as growing on acid soils (Wilkinson & Stace 1991). In France it has generally been regarded as a calcifuge (Portal 1999). However, the two populations found in the vicinity of Torquay occur on limestone headlands. In addition, the majority of records come from the area between Start Point and Bolt Tail where the rocks fall into two main groups, the mica-schists and hornblende-chlorite schists, which were formed by the metamorphism of mafic lavas or sills (Durrance & Laming 1982). A pulverised sample of the hornblende schist from near Prawle Point had a pH of 8.2. Consequently, it was thought desirable to collect soil samples from below plants and to determine pH in the laboratory. Testing was completed on fresh soil within 24 hours of collecting the samples from the mica-schist and hornblende-chlorite schist sites and 48 hours for the limestone site (Table 1). Standard laboratory procedures were followed.

#### HABITAT

On the south Devon coast *F. longifolia* occurs in sunny exposed situations, close to the edge of the sea cliffs, mostly on flat or gently sloping surfaces of large outcrops of both rock types, usually where there is some soil. It can also be found occasionally in vertical crevices. Soils on both the mica and hornblende are immature, rich in raw humus but prone to dry out. There is little, if any, root penetration of the rock surface. Where plants are established in very thin soil or growing in fissured rock, they will be small and scattered but may be the dominant species in an open community. Where the soil is a little deeper *F. longifolia* forms semi-continuous cover, with the associated species growing amongst it. In these circumstances plants can be moderately robust, and form tussocks 15 cm or more in diameter. However, in general, where the soil depth exceeds about 10 cm *F. longifolia* is excluded by more competitive species such as *Festuca rubra*. In these situations the occurrence of *F. longifolia* appears to be limited only by the size of the outcrop. Between Start Point and Bolt Tail there are many such sites. The total population almost certainly consists of thousands of individual plants.

TABLE 1. THE PH OF SOIL TAKEN FROM BELOW ESTABLISHED *FESTUCA LONGIFOLIA* (THUILL.) PLANTS IN DEVON AT THE END OF APRIL 2000

Rock type	Locality	pH
Mica schist	Bolberry Down	4.7
	Cathole Cliff	5.1
	Hugh's Hole	5.0
	Whitechurch	5.3
Hornblende-chlorite schist	Elanders Cove	6.1
	Maceley's Cove	5.9
	Gammon Head	5.4
	Hamstone Cove	5.3
	Hamstone Cove	5.7
Limestone	Fishcombe Point	7.3
	Fishcombe Point	7.6
	Fishcombe Point	7.7
	Fishcombe Point	8.5

In addition to the cliff edge populations reviewed here, *F. longifolia* has also been found a short distance inland (R. Arigho, pers. comm., 1995) where rocky outcrops of both the mica and hornblende schists occur a field or so behind the shore. It is known to occur here in somewhat similar circumstances but the more maritime associates are, presumably, absent.

In the Torbay area *F. longifolia* grows at Fishcombe Point on sheltered south facing slopes in thin soil amongst small limestone outcrops where small groups of plants occur in open communities. The soils here are less organic and very freely draining. It probably occurs in similar situations on Berry Head.

In Devon, 47 species were found growing in association with *F. longifolia* (Appendix 2). Only *Dactylis glomerata* was more-or-less constant, as a dwarfed form, whilst *Sedum anglicum* was found on all three rock types. *Armeria maritima* was constant on the schists but absent on the limestone. The other associated species were either annuals, bulbs or dwarf forms of, presumably, drought-tolerant species.

#### DISCUSSION

It is, perhaps, not very surprising that *F. longifolia* has been found on the coast of south Devon. In the Channel Islands, it once occurred in Jersey and may still be found on Guernsey, Sark and Herm where it occurs on coastal cliffs in shallow organic soils over granite or in cracks and crevices in the rock (Trist 1996). Populations here are small, no more than 5–10 individuals at irregular intervals, where the few constant associates include *Armeria maritima*, *Dactylis glomerata*, *Sedum anglicum*, *Trifolium campestre* and *Vulpia bromoides*.

*F. longifolia* is also known from the western coast of Normandy, France (Portal 1999) where it occurs between Avranches and Flamanville. These populations, described by Huon (1970) using the name *Festuca glauca* Lam., occur on coastal schistose cliffs, fixed dunes and, in one locality, on carboniferous limestone a short distance inland. The pH of these three types of substrate was 5.4, 8.0 and 7.6 respectively. Huon came to the conclusion, that in Normandy, *F. longifolia* was indifferent to the nature of the substrate and simply occupied xerophyllous habitats.

For many years, the Berry Head record has been ignored and the plant assumed to be restricted to acid soils. However, this record, together with that from Fishcombe Point, both on limestone, indicate that *F. longifolia* is not an obligate calcifuge but occurs on soils with a very wide pH range where taller growing species are excluded by environmental stress. This view is supported by the evidence from Normandy. Given this tolerance of substrate, there is a great deal of apparently suitable habitat on the coast of the south-west peninsula where this species could occur and it seems likely that it may be more widely distributed.

## ACKNOWLEDGMENTS

We wish to thank R. Arigho for stimulating our interest in this species, Derek Wells for making the manuscript and notes of the late P. J. O. Trist available to us, and Julia Tallowin for measuring the pH of the soil samples. The distribution map was prepared using DMAP software produced by Dr. Alan Morton.

## REFERENCES

- DURRANCE, E. M. & LAMING, D. J. C. (1982). *The geology of Devon*. University of Exeter.
- HUON, A. (1970). *Les Fétuques de l'ouest de la France - recherches de biosystematique et de biogeographie*. Thèse Rennes.
- MARGETTS, L. J. (1993). 85th report on botany, vascular plants. *Report and transactions of the Devonshire Association for the advancement of science, literature and the arts* **125**: 227–235.
- MARGETTS, L. J. (1994). 86th report on botany, vascular plants. *Report and transactions of the Devonshire Association for the advancement of science, literature and the arts* **126**: 251–257.
- MARTIN, W. K. (1965). *The concise British Flora in colour*. Ebury Press & Michael Joseph, London.
- MARTIN, W. K. & FRASER, G. T. (1939). *Flora of Devon*, T. Buncle & Co., Arbroath.
- PLANT RECORDS (1995). *Watsonia* **20**: 419–437.
- PORTAL, R. (1999). *Festuca de France*, R. Portal, Vals-prés-le Puy.
- STACE, C. A. (1997). *New Flora of the British Isles*. 2nd ed. Cambridge University Press, Cambridge.
- TRIST, P. J. O. (1973). *Festuca glauca* Lam. and its variety *caesia* (Sm.) Richt. *Watsonia* **9**: 257–262.
- TRIST, P. J. O. (1996). Unpublished manuscript on *Festuca longifolia* Thuill.
- WIGGINTON, M. J., ed. (1999). *British Red Data Books, 1 Vascular Plants*, 3rd ed. Joint Nature Conservation Committee, Peterborough.
- WILKINSON, M. J. & STACE, C. A. (1989). The taxonomic relationship and typification of *Festuca brevipila* Tracy and *F. lemanii* Bastard (Poaceae) *Watsonia* **17**: 289–299.
- WILKINSON, M. J. & STACE, C. A. (1991). A new taxonomic treatment of the *Festuca ovina* L. aggregate (Poaceae) in the British Isles. *Botanical journal of the Linnaean Society* **106**: 347–397.

(Accepted February 2001)

APPENDIX 1 THE DISTRIBUTION OF *FESTUCA LONGIFOLIA* THUILL. IN DEVON

10 km square	Location	Grid	Year	Recorder	Det.
SX63	Bolberry Down	SX687383	1994	LJM & LMS	†
	Cathole Cliff	SX693379	2000	RENS & CJS	‡
	Hugh's Hole	SX679388	2000	RENS & CJS	‡
	nr Bolt Tail	SX672393	2000	RENS & CJS	‡
SX73	nr Sharp Tor, Salcombe	SX729368	1994	LJM & LMS	
	nr Gara Rock	SX742371	1993	LJM & RA	†*
	on Gara Rock	SX751370	1994	LJM & LMS	
	Portlemouth Down	SX747369	1994	LJM & LMS	
	Pigs Nose Valley	SX762363	1994	DAB	†
	Gammon Head	SX764357	1994	DAB	†
SX83	above Lannacombe Beach	SX802372	1995	RA	
	Start Point	SX826372	1993	RA	
SX85	Fishcombe Point	SX918570	1997	RENS & CJS	‡
SX95	Berry Head	SX9456	1936	GTF	1st record ¶

GTF = G. T. Fraser

LJM = L. J. Margetts

LMS = L. M. Spalton

RENS & CJS = R. E. N. & C. J. Smith

RA = R. Arigho

DAB = field meeting, Botany Section, Devonshire Association

\* = conf. T. A. Cope

† = conf. P. J. O. Trist

‡ = conf. L. J. Margetts

¶ = det W. O. Howarth

In addition, a further seven sites in SX73, between Prawle Point and Evator Cove and based on non-flowering material, were marked as provisional by RA. These are unlikely to be any other species since the only other blue-leaved fescue in the *F. ovina* group is *F. glauca* Vill., the garden plant, which is inconceivable here.

APPENDIX 2. PLANT SPECIES ASSOCIATED WITH *FESTUCA LONGIFOLIA* IN DEVON

	Mica schist					Hornblende-chlorite schist				Limestone					
	Bolberry 1	Down 2	Cathole Cliff 1	Hugh's Hole 1	Hole 2	Whitechurch 1	Elanders Cove 1	Maceley's Cove 1	Gammon Head 1	Hamstone Cove 1	Cove 2	1a	Fishcombe Point 1b	Point 2	3
<i>Agrostis capillaris</i>	.		.			.									
<i>Aira caryophylla</i>									.						
<i>Aira praecox</i>	.		.	.		.		.	.	.					
<i>Bromus hordeaceus</i>						.		.	.						
<i>Catapodium marinum</i>						.	.								
<i>Dactylis glomerata</i>	.		.	.	.	.	.	.	.	.	.	.	.	.	.
<i>Festuca ovina</i>								.				.	.	.	.
<i>Festuca rubra</i>						.	.	.							
<i>Holcus lanatus</i>						.									
<i>Carex flacca</i>												.			
<i>Hyacinthoides non-scripta</i>	.														
<i>Scilla verna</i>						.	.	.	.		.		.		
<i>Achillea millefolium</i>			.	.		.	.						.		.
<i>Anthyllis vulneraria</i>						.	.						.		.
<i>Aphanes arvensis s.l.</i>									.						
<i>Armeria maritima</i>	.	.	.	.	.	.	.	.	.	.	.				
<i>Bellis perennis</i>									.	.					
<i>Cerastium diffusum</i>	.		.	.	.	.	.	.	.	.	.				
<i>Daucus carota</i>						.	.				.	.			
<i>Erica cinerea</i>	.							.			.	.			
<i>Euphorbia portlandica</i>											.	.	.	.	.
<i>Hedera helix</i>							.		.				.		
<i>Pilosella officinarum</i>			.								.	.	.		
<i>Hypochaeris radicata</i>	.	.	.	.	.	.	.	.	.	.			.		.
<i>Inula conyzae</i>															.
<i>Jasione montana</i>					.										
<i>Leontodon saxatilis</i>						.							.		
<i>Lotus corniculatus</i>				.											
<i>Lotus subbiflorus</i>										.					
<i>Moenchia erecta</i>			.	.	.	.			.						
<i>Myosotis discolor</i>				.											
<i>Plantago coronopus</i>	.		.	.	.	.	.	.	.						
<i>Plantago lanceolata</i>			.	.	.	.	.	.	.						
<i>Rumex acetosa</i>			.	.											
<i>Sanguisorba minor</i>											.	.	.	.	
<i>Sedum anglicum</i>	.	.	.	.	.	.	.	.	.				.	.	
<i>Silene uniflora</i>	.		.					.							
<i>Sonchus oleraceus</i>							.								.
<i>Spergularia rupicola</i>				.		.									
<i>Teucrium scorodonia</i>				.		.									
<i>Ulex europaea</i>	.							.		.					