

STELLARIA NEMORUM L. SUBSPECIES GLOCHIDISPERMA MURBECK
IN BRITAIN

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INTRODUCTION

In June 1953 a short paper was published by A. Lawalrée (1953) in which attention was drawn to the existence in Belgium of subspecies *glochidisperma* of *Stellaria nemorum*. As this subspecies seems quite distinct and had been overlooked for some time in the Belgian flora, I decided to look at the material in the British Herbarium at the Royal Botanic Garden, Edinburgh, and there discovered a single specimen (Plate 1a). It had been collected at Llandogo in Monmouthshire more than a century ago and the label reads: "Ex Herb. F. Farre, Llandogo, Monmouthshire, at the falls, 32.6.29."

DISTRIBUTION

In order to confirm this record and see whether further specimens and records from Britain exist, material was studied from the following herbaria, to whose authorities grateful acknowledgment is made: Aberdeen University, Birmingham University, British Museum (Natural History), Cambridge University, National Museum of Wales and Royal Botanic Gardens, Kew. In all, collections have been discovered from four counties: Monmouthshire, Cardiganshire, Montgomeryshire and Merionethshire. The detailed localities, together with a formal description, are given at the end of this paper.

Very recently Lawalrée (1954a) has recorded the occurrence of subsp. *glochidisperma* in France and Spain, and at the conference of the Botanical Society of the British Isles, held on April 9th and 10th, 1954, Dr. Ch. H. Andréas of Groningen read a short paper in which she discussed its occurrence and ecology in Holland. These records have considerably extended the known range of the subspecies on the continent. It was originally described from Yugoslavia (from that part formerly known as Herzegovina) and is a central European subspecies, reaching in the north as far as southern Sweden and eastern Denmark, in the west to Wales, France and central Spain and in the south to Corsica and Italy (the Apennines). Its eastern limit is uncertain but it is probably the plant named from Russia as var. *subbracteolata* Fenzl (Ledebour 1842). A map showing its distribution in Scandinavia is given by Hultén (1950).

DESCRIPTION

Stellaria nemorum subsp. *glochidisperma* is most easily distinguished with certainty from subsp. *nemorum* by two characters: one of the inflorescence and the other of the seed.

In subsp. *nemorum* the bracts of the inflorescence decrease gradually in size at each dichotomy of the cyme (Plate IIb), whilst in subsp. *glochidisperma* their size decreases abruptly after the first pair. The second pair is rarely more than a quarter of the length of the first, and the third is characteristically scale-like (Plate IIa). In those specimens of subsp. *glochidisperma* investigated, the length of the second bract ranges from 10-27% of that of the first (with one robust specimen up to 50%, but even then with extremely small third bracts), and in subsp. *nemorum* from 30-85%. It is important not to mistake the small flowering branches which occur occasionally in the axils of the upper leaves for the first branches of the inflorescence (Plate IIa). The inflorescence proper always has a flower arising between the two dichotomous branches.

The edge of the ripe seed of subsp. *nemorum* is furnished with rows of rounded more or less hemispherical tubercles, whilst the margin of the seed of subsp. *glochidisperma* has long cylindrical papillae about 0.15 mm. in length, which under the microscope are seen to possess a barbate cap. A warning should be added that when the seed is immature the marginal tubercles in subsp. *nemorum* may seem longer in proportion to breadth than when mature; especially is this the case in herbarium material where the immature seed has become somewhat shrivelled.

A further characteristic, although not diagnostic in itself, is that in subsp. *glochidisperma* the uppermost leaves are stalked whilst those of subsp. *nemorum* are usually sessile or subsessile. This is an unreliable character where the specimen is either a very lush *nemorum* or a diminutive *glochidisperma*, whilst in young growth and on vegetative shoots the leaves of both subspecies are stalked. Typically, a flowering specimen of subsp. *glochidisperma* has the appearance of *Circaea lutetiana*; a figure is to be found in Hegi (1911 a or b) under the synonym, subsp. *circaeoides* A. Schwarz.

In addition to these distinguishing characters, Murbeck in his original description of subsp. *glochidisperma* (Murbeck 1892) mentioned several others which on being tested have proved to be either of little value or else to be common to both subspecies. (1) It was claimed that the stem leaves of subsp. *glochidisperma* are broader. If breadth alone is considered this is quite false, and even if breadth is considered relative to length there is no difference between the two subspecies in ordinary vegetative leaves. Only with the pair of leaves at the last node before the first branching of the cyme does there seem to be any difference, and even then it can only be said that there is a tendency for subsp. *glochidisperma* to have leaves broader in proportion to their length. In the specimens measured, the index of leaf-breadth divided by leaf-length for subsp. *nemorum* was 0.31-0.59 and for subsp. *glochidisperma* 0.39-0.70. (2) Subsp. *glochidisperma* is said to possess more cordate leaf bases. Examination again shows that this is not so in purely vegetative leaves and that only in the uppermost ones, including the first pair of bracts, is there a slight difference. In subsp. *nemorum* they are truncate to rounded, whilst in subsp. *glochidisperma* they are subcordate to truncate. Furthermore, there is a tendency in both subspecies for the leaf blade to be slightly decurrent. This tendency is greater subsp. *nemorum*, partly because the leaf base is less cordate and partly because the petiole is usually shorter. In leaves which are very shortly stalked or subsessile the decurrent wing makes the leaf base merge into the axis of the shoot. (3) The capsule is said to be twice as long as the calyx in subsp. *glochidisperma* and only a third longer in subsp. *nemorum*. This has proved a difficult character to test, as relatively little of the available material has fully ripe capsules. It seems there may be a tendency in subsp. *glochidisperma* for the capsules to be longer in proportion to the calyx length, but it is doubtful if it is as significant as has been claimed by Murbeck. (4) Another character that has not been tested is that the fruiting pedicel in subsp. *glochidisperma* lies in line with the axis whilst in subsp. *nemorum* it lies bent at an angle. It is quite impossible to observe this with certainty on herbarium material and field or experimental garden studies will be necessary.

Early in this investigation, before it was known that the chromosome numbers of both subspecies had been found to be the same ($2n = 26$, Peterson 1936), it was thought possible that one of them might be a polyploid. Had this been so it might have been reflected in the pollen grain sizes and stomatal indices of the two subspecies. No significant difference in pollen grain size between the two subspecies was found, however. The pollen of six specimens of subsp. *glochidisperma* was measured and the total range in diameter found to be (40 —) 41-48 (— 50) μ , whilst in nine specimens of subsp. *nemorum* the total range was (39 —) 41-47 (— 50) μ ; ten grains per specimen were measured. No comparison has so far been possible between the stomatal indices, that is in the proportion of stomatal

cells to ordinary epidermal cells (for details of the method of calculation etc., see Salisbury, 1927 ; or Rowson in Howard & Manton, 1946), and, despite experimentation with various techniques, attempts to use herbarium material have proved unsatisfactory. Thus the only diagnostic characters so far known depend upon the plant being at least at the flowering stage.

POSSIBLE HYBRIDS

As has been mentioned, both subspecies have the same chromosome number and Peterson (1936, 324) has reported, as the result of hybridisation experiments, that they are fully interfertile, the hybrid producing well developed pollen and ovules and viable seeds. These seeds are intermediate between those of the parents. According to Dr. Andréas, the two subspecies are separated ecologically (at least in Holland) but there seems no doubt that they do cross when they happen to meet in the wild. Lawalrée (1954b) has reported intermediate specimens from Belgium and there are three herbarium sheets in the National Museum of Wales, Cardiff, and one in Birmingham University which seem intermediate in character. These four specimens are listed towards the end of this paper in the section dealing with the detailed British distribution and there seems no reason to doubt that as both subspecies have been collected and recorded from the area of the Wye Valley a number of intermediate plants may occur in that district. Only one of the four specimens cited bears seeds, and even these are immature, but the intermediate status of the plants is shown by a combination of the two characters : length of the petiole of the uppermost vegetative leaf and the proportional length of the second inflorescence bract to the first : see Table.

TABLE

Locality	Length of petiole of uppermost vegetative leaf.	Length of second inflorescence bract as a percentage of that of the first.
1. Between Bigsweir and St. Briavels	1.5-2.0 cm.	16-56%
2. Llandogo Glen	1.5-3.5 cm.	41-78%
3. Whitebrook	2-3 cm.	42-71%
4. Cwm Rhaiaadr	1-1.5 cm.	32-50%

Very few abortive pollen grains were found in three of the specimens cited above and, as has been mentioned, Peterson pointed out that the pollen in the hybrid is fully developed. However, whatever its significance may be, in the specimen from Cwm Rhaiaadr, Llyffnant Valley, the proportion of abortive grains is quite high.

STELLARIA MONTANA Pierrat.

Amongst the Continental material in the Herbarium at Kew, I have had my attention drawn by Mr. R. D. Meikle to three specimens collected in July 1879 at Gerbamont, Rochesson, Vosges, France (Plate IIc). This material was described as a new species : *Stellaria montana* D. Pierrat (1880, *Comptes Rendus Soc. Bot. Rochelaise*, 2, 58)*. I have

* Not the plant from Alamos, Mexico, named *S. montana* J. N. Rose (1891, *Contrib. U.S. Nat. Herb.*, 1, 93) which is the only *S. montana* at present listed in the *Index Kewensis*.

not seen this description, but mounted on the sheet with the specimen is a printed diagnosis which, though somewhat inadequate, is sufficient in itself to constitute valid nomenclatural publication. This material is undoubtedly the same taxon as *S. nemorum* subsp. *glochidisperma* and, whilst the name *S. montana* Pierrat seems to have been overlooked recently, it was apparently treated at one time as synonymous with the typical subspecies, known to-day as subsp. *nemorum* (Murbeck, 1899; Hegi, 1911a and b). However, this isotype material shows this interpretation to be incorrect. Ascherson and Graebner (1919) suggest that the two taxa may be the same but say that they have seen no authentic material of *S. montana*, whilst Rouy and Foucaud (1896) treat it as a variety and with it, but separate, list var. *subbracteolata* Fenzl. Fortunately, if we retain the subspecific rank for this plant, and there do not seem sufficient grounds for considering it as a separate species, there is no need for a change of name, *glochidisperma* being the earliest epithet in the rank of subspecies.

STELLARIA NEMORUM L. subspecies *GLOCHIDISPERMA* Murbeck, 1892, *Acta Univ. Lund.*, **27**, (5), 156-157.

An ascending or erect herb, 15-30 (-50) cm. high, usually smaller than subsp. *nemorum*. Leaves ovate, the upper ones broadly so, cordate to deeply cordate, the ultimate pair subcordate to truncate (truncate to rounded in subsp. *nemorum*); petioles longer than in subsp. *nemorum*, the lower ones up to 5 cm. long, the upper pair usually at least 1 cm. long as compared with 0.5 cm. or less in subsp. *nemorum*. Bracts of the inflorescence diminishing abruptly in size after the first dichotomy of the cyme, the second pair rarely more than a quarter the length of the first, the third pair scale-like, 1.5 (-2) mm. or less in length. Seeds furnished round the margin with long cylindrical papillae, 0.15 mm. in length.

DETAILED BRITISH DISTRIBUTION

The following specimens of *Stellaria nemorum* subsp. *glochidisperma* have been seen :

- v.c. 35, Monmouth; Llandogo, at the falls, 1832, ex Herb. F. Farre, (E); Llandogo, 1836, J. Bell, (B.M.); Llandogo Glen, 1877, A. Ley, (Birm.), (N.M.W.).
- 46, Cardigan; woods in Cwm Rhaiaadr Valley, 1885, A. Ley, (Birm.); Glaspwll, Llyffnant Valley, 1924, J. H. Salter, (N.M.W.); oakwood in Llyffnant Valley, 1938, W. B. Turrill, (K.).
- 47, Montgomery; Llyffnant Valley, 1941, J. A. Webb, (N.M.W.).
- 48, Merioneth; Llechwedd Wood, nr. Harlech, 1903, W. G. Hamilton & D. A. Jones, (N.M.W.).

In addition there are the following specimens of possible hybrid origin: subsp. *glochidisperma* × subsp. *nemorum* :

- v.c. 34, W. Gloucester; streamlet in boggy wood between Bigsweir and St. Briavels, 1893, W. A. Shoolbred, (N.M.W.).
- 35, Monmouth; wooded bank of stream, Llandogo Glen, 1897, W. A. Shoolbred, (N.M.W.); Manor Wood, Whitebrook, 1942, S. G. Charles, (N.M.W.).
- 46 or 47, Cardigan or Montgomery; Cwm Rhaiaadr, 1860, A. Ley (Birm.).

(The following are the abbreviations used to denote the herbaria in which the specimens listed above exist: Birm.—Birmingham University. B.M.—British Museum (Natural History). E.—Royal Botanic Garden, Edinburgh. K.—Royal Botanic Gardens, Kew. N.M.W.—National Museum of Wales, Cardiff.)

In the collection at Kew is a sheet with a mixture of specimens of subsp. *nemorum* and subsp. *glochidisperma* marked "Suffolk, Herb. Hookerianum 1867." It is difficult to believe that these plants really came from Suffolk which is right outside the range of both subspecies, and in view of the fact that the sheet is mixed and that Hooker received

a very great number of plants from correspondents it seems best to treat the "Suffolk" locality as a mistake.

In order to complete the record of distribution, determinable material of subsp. *memorum* has been seen from the following vice-counties.

4. N. Devon.	64. Mid W. York.	*82. Haddington.
35. Monmouth.	65. N. W. York.	83. Edinburgh.
36. Hereford.	66. Durham.	84. Linlithgow.
39. Stafford.	67. S. Northumberland.	85. Fife.
42. Brecon.	68. Cheviotland.	86. Stirling.
44. Carmarthen.	69. Westmorland.	87. W. Perth.
48. Merioneth.	70. Cumberland.	88. Mid Perth.
54. N. Lincoln.	72. Dumfries.	89. E. Perth.
57. Derby.	73. Kirkcudbright.	90. Forfar.
58. Cheshire.	75. Ayr.	94. Banff.
59. S. Lancs.	77. Lanark.	95. Elgin.
60. W. Lancs.	79. Selkirk.	96. Easternness.
62. N. E. York.	80. Roxburgh.	99. Dunbarton.
63. S. W. York.	81. Berwick.	

Vegetative material which is underterminable as to subspecies although probably subsp. *memorum* has been seen from

51. Flint, 91. Kincardine and 92. S. Aberdeen.

Finally *S. nemorum* has been recorded from the following vice-counties but no material has been seen by the author; in brackets are listed those from which doubtful records, which need to be confined, exist.

(37. Worcester.)	(38. Warwick.)	(40. Salop.)
(41. Glamorgan.)	49. Caernarvon.	(61. S. E. York.)
(71. Isle of Man.)	74. Wigtown.	76. Renfrew.
78. Peebles	(93. N. Aberdeen.)	(109. Caithness.)

It should also be looked for in 43, Radnor and 50, Denbigh where it may well occur but has not been recorded.

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* Not listed in Druce, G. C., 1932, *Comital Flora of the British Isles*.

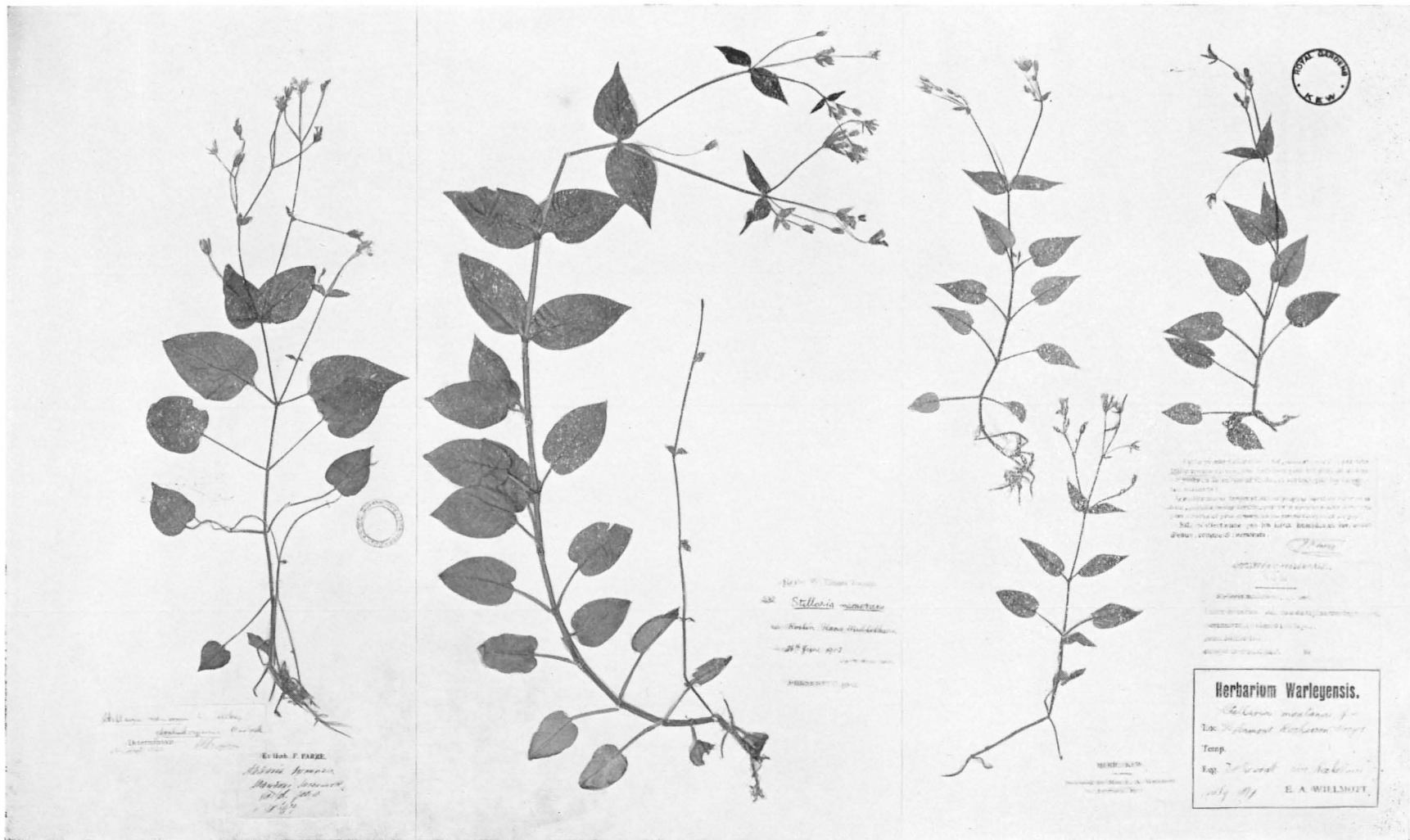


PLATE II.

a. *Stellaria nemorum* L. subsp. *glochidisperma* Murb. ($\times \frac{5}{16}$).

b. *Stellaria nemorum* L. subsp. *nemorum* ($\times \frac{5}{16}$).

c. Isotypes of *Stellaria montana* Pierrat ($\times \frac{5}{16}$).