

THIRD REPORT OF THE COMMITTEE ON FLORAL AREAS.

The present report, covering all the families of the Fern Allies except *Isoetaceae* follows the lines of its two predecessors,¹ giving a check list of the New England species and a geographic grouping of them according to their ranges within our area. In the check-list are included all varieties recognized in Gray's Manual and nearly all proposed in subsequent revisions; some of these, which appear to be mere forms without distinctive or significant ranges are, however, omitted in the geographic treatment. The nomenclature is that of the Manual somewhat modified by the studies mentioned. The principal changes are: the restoration of the old sixth edition name *Equisetum limosum* in place of *E. fluviale*, a change which proves to be required by the International Rules²; and the substitution of *Botrychium dissectum* for *B. obliquum*, the former being the earliest name in the group.³ One of the Manual varieties calls for a new combination under *B. dissectum*: in making the transfer, this variety is here reduced to a form, since that appears to be its correct taxonomic status.⁴

PRELIMINARY LISTS OF NEW ENGLAND PLANTS—
XXVIII.

[The sign + indicates that an herbarium specimen has been seen; the sign — that a reliable printed record has been found.]

OPHIOGLOSSACEAE	Me.	N. H.	Vt.	Mass.	R. I.	Conn.
<i>Botrychium angustisegmentum</i> (Pease & Moore) Fernald .	+	+	+	+	+	+
“ <i>dissectum</i> Spreng. . .	+	+	+	+	+	+
“ “ f. <i>elongatum</i> (Gilbert & Haberer)						
Weatherby	+			+		—

¹ RHODORA xx. 181–185; 193–197 (Oct., Nov., 1918): xxii. 80–89 (May, 1920).
² RHODORA xxiii. 43–47 (Apr., 1921).
³ See Clute, Fern Bull. x. 76 (1902).
⁴ BOTRYCHUM DISSECTUM Spreng., f. **elongatum** (Gilbert & Haberer) Weatherby, n. comb. *B. obliquum elongatum* Gilbert & Haberer, Fern Bull. xi. 89 (July, 1903).

OPHIOGLOSSACEAE		Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Botrychium	dissectum Spreng.						
"	" f. obliquum (Muhl.) Fernald . . .	+	+	+	+	+	+
"	" f. oneidense (Gilbert) Clute . .	+	+	—	+		
"	Lunaria (L.) Sw. . .	+		+			
"	ramosum (Roth) Aschers.	+	+	+	+	+	+
"	simplex E. Hitchcock .	+	+	+	+	+	+
"	" var. compositum (Lasch) Milde	+	+	+			
"	ternatum (Thunb.) Sw.						
"	var. intermedium D. C. Eaton .	+	+	+	+		+
"	" var. rutaefolium (A. Br.) D. C. Eaton	+	+	—			
"	virginianum (L.) Sw. .	+	+	+	+	+	+
"	" var. europaeum Angström	+	+	+			
"	" var. intermedium Butters	+		+	+		+
"	" var. laurentianum Butters	+					
Ophioglossum	vulgatum L. . . .	+	+	+	+	+	+
"	" var. minus Moore . .		—				
MARSILEACEAE							
Marsilea	quadrifolia L. . . .	+			+		+
SALVINIACEAE							
Azolla	caroliniana Willd. . . .				+		

EQUISETACEAE		Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Equisetum	arvense L.	+	+	+	+	+	+
"	hyemale L., var. affine (Engelm.) A. A. Eaton	+	+	+	+	+	+
Equisetum	hyemale L., var. inter- medium A. A. Eaton			+			+
"	limosum L.	+	+	+	+	+	+
"	litorale Kühlewein	+	+	+	+		
"	palustre L.	+	+	+			+
"	pratense Ehrh.	+	+	+	+		+
"	scirpoides Michx.	+	+	+	+		+
"	sylvaticum L., var. pauci- ramosum Milde.	+	+	+	+		+
"	" pauciramosum f. multira- mosum Fernald	+	+	+	+	+	+
"	variegatum Schleich.	+	+	+	+		+
"	" var. Jesupi A. A. Eaton	+		+			+
LYCOPODIACEAE							
Lycopodium	annotinum L.	+	+	+	+		+
"	" var. acrifol- ium Fernald	+	+	+	+		+
"	" var. alpestre Hartm.		+				
"	" var. pungens Desv.	+	+	+			
"	clavatum L.	+	+	+	+	—	+
"	" var. megas- tachyon Fer- nald & Bis- sell	+	+	+	+	+	+
"	" var. monos- tachyon Grev. & Hook.		+				
"	complanatum L.	+	+	+			
"	" var. flabelli- forme Fernald	+	+	+	+	+	+

LYCOPODIACEAE		Me.	N. H.	Vt.	Mass.	R. I.	Conn.
Lycopodium complanatum L. . .							
"	var. Wibbei Haberer .			+			
"	inundatum L. . .	+	+	+	+	+	+
"	var. alopecuroides (L.) Tuckerm.				+		
"	var. Bigelovii Tuckerm.				+	+	+
Lycopodium lucidulum Michx. . .		+	+	+	+	+	+
"	var. porophyllum (Lloyd & Underw.) Clute. .	+		—			
"	obscurum L. . .	+	+	+	+	+	+
"	var. dendroideum (Michx.) D. C. Eaton.	+	+	+	+	+	+
"	sabinaefolium Willd. .	+	+	+			
"	Selago L. . .	+	+	+	+		+
"	var. appressum Desv. . .	+	+	+			
"	var. patens (Beauv.) Desv.			+			
"	sitchense Rupr. . .	+	+	—			
"	tristachyum Pursh .	+	+	+	+		+
SELAGINELLACEAE							
Selaginella apoda (L.) Fernald . .		—	+	+	+	+	+
"	rupestris (L.) Spring	+	+	+	+	+	+
"	selaginoides (L.) Link	+					

Two of the above species, *Marsilea quadrifolia* and *Azolla caroliniana*, are, the latter certainly and the former in all probability, introduced. The *Azolla* seems to have been first collected in a pond in Forest Park, Springfield, Mass., in 1892, by Mrs. M. L. Owen and in 1896 was reported as spreading. From information kindly furnished us by Dr. W. H. Chapin, it now appears to be extinct. There is no other New England locality for it on record.

Marsilea quadrifolia was first reported in the addenda to the fourth edition of Gray's Manual in 1863 from Bantam Lake, Litchfield, Conn., where it had been collected by Dr. T. F. Allen, and was long supposed to be native there. It does not appear, however, in J. P. Brace's comprehensive list of plants of Litchfield and vicinity published in 1822: very probably, as is surmised in the 7th edition of the Manual, it was "casually introduced" at some time between these two dates. Another Connecticut station, at Cromwell, is known to have existed for at least 45 years. The plant is easily established in still, shallow water and has been introduced at Maranacook and Skowhegan, Maine; Boxford, Billerica, Concord, Salem, Malden, Cambridge, Jamaica Plain, West Roxbury, Needham and Dedham in eastern Massachusetts; and, besides the two stations above mentioned, at New Haven and Middlebury, Conn.

The arrangement of the native species given below follows in general that of our last report: readers are referred to that report for definitions and explanation of groups there adopted. We have recognized here four new groups, for the reasons given under them and from the belief that better results can be obtained by creating categories as numerous as may be required to bring like ranges together than by attempting to crowd all our plants, almost endlessly various in their distribution as they are, into a few generalized divisions. Where possible, we have used, as titles for the groups, condensed statements of the ranges concerned and in so doing have employed more definitely than hitherto the Cape Cod region⁵ and the upper St. John valley in northern Aroostook Co., Maine,⁶ as, in some sort, index areas. These two regions—the former mainly of sandy, acid soils without rock outcrops and of oak and pitch pine barrens, the latter with heavy, often calcareous soils, river cliffs and wide stretches of Canadian forest; one with the mildest climate in New England, the other with one of the most severe—are well-nigh complete antitheses of each other. One offers the extreme of austral conditions, the other, (except for the very limited alpine areas on

⁵ Comprising southeastern Plymouth County and all of Barnstable, Dukes, and Nantucket Counties. This region is not homogeneous, as the occurrence in certain localities within it of such woodland types as *Botrychium ramosum* and *Lycopodium lucidulum* testifies; but these boundaries seem sufficiently accurate for our present purpose. The region is referred to, for brevity, as Cape Cod.

⁶ Comprising that part of Aroostook County north and west of the Aroostook Valley. Referred to as the upper St. John.

our mountain-tops) the extreme of boreal conditions within our territory. Species found in both may be expected to occur generally in New England elsewhere: and so much collecting has been done in both that the absence of any record of a given species from either may be accepted with little or no doubt as representing the facts.

It is to be understood that species which are alike in being found throughout a given area may differ considerably in the frequency of their occurrence. The groups here defined are, of course, likely to require revision with increase of our knowledge. The committee will be grateful for any data which modify the ranges as stated.

I. GENERALLY DISTRIBUTED.

Botrychium ramosum

“ *virginianum*

Equisetum arvense

“ *limosum*

Lycopodium complanatum,
var. *flabelliforme*

Lycopodium lucidulum

“ *obscurum*

“ “

var. *dendroideum*

Lycopodium tristachyum

Although, at the present stage of our work, it is impossible to classify these species otherwise than as generally distributed and though they occur in all, or very nearly all, parts of New England, they differ somewhat in the details of their distribution. Only *Equisetum arvense*, *Lycopodium obscurum* and its var. *dendroideum* seem to occur quite evenly throughout. *Botrychium ramosum*, *Lycopodium complanatum*, var. *flabelliforme* and *L. tristachyum*, though found in the Ft. Kent-Van Buren region, apparently become noticeably less common in northern Maine and were not observed by St. John and Nichols on their journey from Moosehead Lake to St. Francis via the upper reaches of the St. John River. *Botrychium virginianum*, though known from extreme southeastern Maine at Pembroke, conspicuously avoids the vicinity of the coast between that point and the Kennebec valley. *Lycopodium tristachyum* has, curiously, not been reported from Rhode Island though occurring on all sides of that state. It seems altogether probable that it will eventually be found there. The two *Botrychiums*, *Equisetum limosum*, and *Lycopodium lucidulum* are very rare in the Cape Cod region; thereby, their ranges form a transition to the following group.

II. GENERALLY DISTRIBUTED, EXCEPT IN CAPE COD.

Equisetum sylvaticum,var. *pauciramosum*⁷*Lycopodium clavatum**Lycopodium clavatum*, var. *megastachyon*

Species with this range (e. g., *Cystopteris fragilis*) occurred in the families previously reported upon, but were then included among the generally distributed species. It now seems to us, however, desirable to segregate them, since the absence of any plant from Cape Cod is likely to be significant of its preferences as to soil and habitat conditions.

The species here included are inhabitants of moist or dry woodlands or rarely meadows, in comparatively rich soils. Their absence from Cape Cod is doubtless due to lack of suitable habitats there.

III. NEITHER THE UPPER ST. JOHN NOR CAPE COD; RATHER GENERAL ELSEWHERE.

*Botrychium simplex**Botrychium ternatum*,var. *intermedium**Equisetum hyemale*, var. *affine*

This group corresponds closely to the "Rich Soils" group of the last report. *Botrychium simplex* is not known to us from any point in Maine north of about the 45th parallel of latitude, except for a single outlying station at Bridgewater (Kate Furbish). *B. ternatum*, var. *intermedium* reaches slightly further north in central Maine and has similar outlying stations at Mars Hill and Limestone. These isolated occurrences are probably to be accounted for by the existence in eastern Aroostook County of a large area characterized by a hardwood forest of a distinctly southern type.⁸ *Equisetum*

⁷ Including, for our purposes, f. *multiramosum*. The stations for typical var. *pauciramosum* are all within the range of group III; but they are few and scattered and we doubt if their distribution indicates anything but accidents of collection.

⁸ See Goodale in 6th Rep. Maine Board of Agric. 370ff. (1861). Prof. Goodale was struck by the contrast between the vegetation of this area and that of the upper St. John, from which he had just come. He had no opportunity to ascertain its extent. Prof. Fernald, to whom we are indebted for the reference to Goodale's work, informs us that it runs from the Aroostook Valley on the north to that of the Mattawamkeag on the south, and west to about the 69th parallel of longitude. On the southwest a narrow arm connects it with the hardwood forest area of central Maine, forming an avenue of emigration for woodland species.

hymale, var. *affine*, which prefers loose soils, especially on terraces and banks near streams, has about the same northern limit as *B. simplex*, but without the outlying station: though it occurs at Pembroke in Washington Co., it has not been found near the coast between that point and Wells.

IV. NORTHERN.

A

Equisetum scirpoides	Lycopodium annotinum
Lycopodium annotinum, var. acrifolium	

B

Botrychium ternatum, var. rutaefolium	Lycopodium clavatum, var. monostachyon
Botrychium virginianum, var. europaeum	Lycopodium complanatum
Botrychium virginianum, var. laurentianum	Lycopodium sabinaefolium
Lycopodium annotinum, var. alpestre	Lycopodium Selago
Lycopodium annotinum, var. pungens	“ “ var. patens

Lycopodium sitchense

This group corresponds exactly with that of the same name in our last report. Of the species in sub-division A, *Equisetum scirpoides* reaches its southern limits at Southbridge, Mass., and in northwestern Connecticut. The two *Lycopodiums* reach Cape Ann, the central highland of Massachusetts and western Connecticut; *L. annotinum* var. *acrifolium* is found also at Union, in the eastern highland of Connecticut. It seems to be much less common in Maine than typical *L. annotinum*, and is not recorded by St. John and Nichols.

Of sub-division B, *Lycopodium annotinum*, var. *alpestre* is known in our area only from Mt. Lafayette, *L. clavatum*, var. *monostachyon* only from Mt. Washington and *L. Selago*, var. *patens* only from Mt. Mansfield. Typical *L. Selago*⁹ is chiefly confined to mountainous

⁹ Including var. *appressum*.

regions, occurring on Mt. Katahdin, the Bigelow Range, and Sargent Mt. on Mt. Desert Island in Maine, the White Mountain region and Mt. Monadnock in New Hampshire, Mt. Mansfield in Vermont and Mt. Greylock in Massachusetts. But it occurs also at lower altitudes at East Dover, N. H., and Johnson, Vt., has a station at Mt. Holyoke in Massachusetts and descends nearly to sea level at Deer Isle, Me., and on trap ridges near New Haven, Conn. The other species and varieties are all, apparently, rather rare, occurring at comparatively few and scattered stations in the three northern states. Only *Lycopodium annotinum*, var. *pungens* reaches the vicinity of the sea, at Lubec, Cutler and Wass Island on the cold eastern coast of Maine: only *L. complanatum* and *L. sabinacifolium*, which are both found at Hartland, Vt., extend further south than the White Mountain region.

V. CAPE COD AND RATHER GENERAL ELSEWHERE, BUT NOT THE
UPPER ST. JOHN.

Botrychium angustisegmentum	Botrychium dissectum, f. obliquum
Botrychium dissectum	Ophioglossum vulgatum ¹⁰
Lycopodium inundatum	

This group corresponds essentially to the Southern A of the last report. *Botrychium angustisegmentum* and *B. dissectum*, like their congeners in group III, have outlying stations at Bridgewater, in the deciduous woods region of northeastern Maine. The former is not known from the Maine coast east of Boothbay. The four Ophioglossaceae are all plants of comparatively southern range, having their northeastern limits in New England or the Maritime Provinces. *Lycopodium inundatum*, on the other hand, is of wide distribution in northern latitudes in America and Eurasia, reaching, in the eastern United States, no further south than Pennsylvania. In any analysis of the geographic elements of the New England flora based on general ranges it would have to be placed in a different group from the other species here included; but within New England its occurrences correspond in general with theirs, except for two stations on the

¹⁰ Including var. *minus*, which appears to be only a starved and depauperate state growing in sand. See Stone, Plants of Southern N. J. 122 (1911).

upper course of the St. John River, just north of the Aroostook County line (St. John and Nichols). Its distribution may perhaps be accounted for by the fact that it is a plant of acid soils, in southern New England at least particularly partial to damp sand, and that such habitats are largely lacking in northern Maine. Conversely, it is, unlike most plants of northern range, common on Cape Cod, where such habitats are to be found in abundance.

VI. CHIEFLY THE THREE SOUTHERN STATES

Selaginella apoda

This is the Southern B of the last report. *S. apoda* is not reported from Cape Cod, where suitable habitats for this plant of moist, grassy places are lacking. It reaches its northern limits at Newfane, Vt., Hanover and Manchester, N. H., and Berwick, Me.

VII. COASTAL PLAIN

Lycopodium inundatum, var. *alopecuroides*

“ “ “ *Bigelovii*

The former is a plant of the Piedmont and coastal plain southward, occurring in our region only on Nantucket. The latter, like the coastal plain species of the last report, penetrates further inland. It is, however, certainly known to us no farther from the coast than Woodstock, Conn., and Groton, Mass., and no farther north than Plum Island, Mass. It has been reported from Sunderland, Vt., and Mt. Desert Island, Me. The Mt. Desert plant and also specimens from Cumberland, Me., distributed as var. *Bigelovii*, appear to us no more than, at most, transitional forms. We have seen no specimens from the Vermont locality; it seems probable, however, that this report is based either on a misidentification or on the misapplication of Tuckerman's name made by Lloyd and Underwood.¹¹

VIII. CALCIPHILE SPECIES.

Botrychium Lunaria

Equisetum variegatum,
var. *Jesupi*

Equisetum variegatum

Selaginella selaginoides

Botrychium Lunaria and *Selaginella selaginoides* are among our

¹¹ See RHODORA xxiii. 100 (1921).

rarest species. The latter is known only from Ft. Kent (A. A. Eaton) and from near the confluence of the St. John and Big Black Rivers (St. John and Nichols), the former from Ft. Kent (J. R. Churchill) and, in Vermont, Willoughby (C. H. Tilton) and St. Johnsbury (Miss Inez Howe). *Equisetum variegatum* and its variety *Jesupi* occur at scattered stations in the larger calcareous areas of New England south to western Connecticut. It is a curious fact that, though their general ranges are the same, they have apparently never been collected at the same place nor nearer than 20 miles to each other.

IX. RIVER-VALLEY

Equisetum litorale

Equisetum palustre

Equisetum pratense

These three species show a discontinuous range, not matched in any group heretofore distinguished. They are chiefly, though not entirely, confined to the valleys of the larger rivers and to the Champlain Valley—a distribution perhaps due to a preference for alluvial soils, to which, however, they are by no means restricted. *E. litorale* is known from the St. John, Penobscot, Kennebec and Androscoggin valleys in Maine; on the lower Merrimac; along the shores of Lake Champlain; and on the Connecticut at Stewartstown, Lebanon and Walpole, N. H., and Westminster, Vt. *E. palustre* occurs in the same valleys, except that of the Penobscot, extending south along the Connecticut to East Windsor and Lyme, Conn., and is found besides at Brandon, Willoughby Lake and near Lake Memphremagog in Vermont. *E. pratense* has a somewhat more irregular distribution. It is known only from the St. John, Kennebec, Connecticut and Housatonic valleys, and from Newark and Brandon, Vt.

X. WESTERN NEW ENGLAND ONLY.

Equisetum hyemale, var. *intermedium*

This is referable to a small group to which *Trollius laxus* and *Hydrastis canadensis* of our first report belong. They are species of more or less wide range in the central United States, touching our area only along its western border and but rarely there. They penetrate eastward no further than the central lowland of Connecticut.

Equisetum hyemale, var. *intermedium* is known from Hartford, Suffield, Oxford and Norfolk in Connecticut and Pownal and Burlington, Vt.

XI. MISCELLANEOUS.

Botrychium virginianum,
var. *intermedium*

Lycopodium lucidulum,
var. *porophilum*

Selaginella rupestris

Selaginella rupestris, the most widely distributed of these plants in New England, has a puzzling range. It is a species of dry ledges, of Alleghanian range outside of New England. With us, it has two stations in extreme northern Maine; but it is almost entirely absent from the White Mt. region, occurring only on the extreme fringes of the mountains at Moultonboro and Berlin, and apparently from northeastern Vermont. In Maine, its stations, except for the two mentioned, are all either near the coast or in the valleys of the Androscoggin and Penobscot Rivers. It is fairly general southward, except on Cape Cod where it is not known—a circumstance readily accounted for by the absence of rock outcrops there. Recent taxonomic study of the group to which *S. rupestris* belongs has segregated a number of southern and western species formerly referred to it. The northeastern members of the group have not yet been critically studied; possibly we have to reckon with more than one species here.

Botrychium virginianum, var. *intermedium* is known from four stations, one each in Maine, Vermont, Massachusetts and Connecticut. More data in regard to it are needed. Similarly the New England stations for *Lycopodium lucidulum*, var. *porophilum* (northern Maine and Clarendon, Vt.) are too few to give any sure indication of the group to which it belongs.

C. H. KNOWLTON

W. S. RIPLEY, JR.

C. A. WEATHERBY

The date of the August issue (unpublished as this goes to press,) will be announced later.



Knowlton, Clarence Hinckley, Ripley, Winfield Scott, and Weatherby, Charles Alfred. 1921. "THIRD REPORT OF THE COMMITTEE ON FLORAL AREAS." *Rhodora* 23, 209–220.

View This Item Online: <https://www.biodiversitylibrary.org/item/14493>

Permalink: <https://www.biodiversitylibrary.org/partpdf/188337>

Holding Institution

Missouri Botanical Garden, Peter H. Raven Library

Sponsored by

Missouri Botanical Garden

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.