

NOTES ON THE OHIO FERNS.

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Of the eighty-three species and varieties of ferns included in the flora of the north-eastern United States forty-three are known definitely to occur in Ohio and are represented by specimens in the State Herbarium. Some of the forms are quite rare, and a few of them are very limited so far as their distribution in the State is now known. It is with the hope of increasing the State collection and extending our knowledge of these interesting plants that special attention is called to this subject. Critical inspection of the list appended below is also solicited. Possibly interest and convenience may be enhanced by the publication of a State Fern Flora, with notes on characters and distribution, figures illustrating venation, fructifications, and such taxonomic characters as beginners, amateurs and students might appreciate. Partial material for such a brochure is at hand but we would much desire for examination a fuller set of specimens from the various counties of the State. Can not every teacher of Botany in Ohio and every one interested in our fern flora assist by sending specimens?

The Fourth State Catalogue, published in 1899, lists forty-nine species of ferns, and a fiftieth is mentioned in the appendix, but not fully authenticated. Since its publication three others have been reported, and a fourth is added in this paper, bringing the total number of ferns reported from the State to fifty-four. Of these eleven must be excluded from the list, as they are not authenticated by herbarium specimens. These are the following.

SPECIES TO BE EXCLUDED FROM THE OHIO LIST.

OPHIOGLOSSUM ENGELMANNI Prantl. The specimens from Painesville, Lake County, labeled as this species in the herbarium, and upon which the publication of the species as a member of the Ohio flora was based, do not differ in any essential respect from *Ophioglossum vulgatum* L. The range given in Britton's Manual for *O. engelmanni* is Virginia and Indiana to Missouri, Texas, and Arizona. It is thus southern in its distribution, with a range about like that of *Polypodium polypodioides* (L.) A. S. Hitchcock, and may therefore yet be found in some of the counties along the Ohio river.

BOTRYCHIUM SIMPLEX E. Hitchcock. Included in the Fourth State Catalogue on the authority of the Newberry Catalogue, in which it was reported from Lorain county by Dr. Kellogg. Its range according to Underwood in Britton's Illustrated Flora is from Prince Edward's Island to Maryland, Wyoming, and California.

MATEUCCIA STRUTHIOPTERIS (L.) Todaro. (*Onoclea struthiopteris* Hoffm.) Reported by Kellerman and Werner in their Catalogue of Ohio Plants from "Lorain Co., A. A. Wright (Cat.); Painesville, H. C. Beardslee (Cat.), Wm. C. Werner." Doubtless to be secured for the State Herbarium.

WOODSIA ILVENSIS (L.) R. Br. Has been reported from Licking county by H. L. Jones, and should probably be regarded as a member of the Ohio flora, although no specimens have been seen by the writers.

WOODSIA GLABELLA R. Brown. This was reported in the J. S. Newberry Catalogue from Lorain county. It is a distinctively northern fern, extending south only to New Hampshire, Vermont, northern New York and the north shore of Lake Superior, and its occurrence in Ohio is extremely doubtful.

DRYOPTERIS CRISTATA CLINTONIANA (D. C. Eaton) Underw. The single specimen from Wayne county in the herbarium belongs to the species; *Dryopteris cristata* (L.) Gray, rather than to the variety, which is much larger, with pinnæ four to six inches long. It has been reported by Otto Hacker and by H. C. Beardslee in his Catalogue of the Plants of Ohio.

DRYOPTERIS SPINULOSA DILATATA (Hoffm.) Underw. Included in the Fourth Catalogue on the authority of H. C. Beardslee.

DRYOPTERIS BOOTII (Tuckerm.) Underw. Specimens in the herbarium accredited to this species are all referable to other species.

WOODWARDIA AREOLATA (L.) Moore. Listed in the Newberry Catalogue from northern and eastern Ohio.

ASPLENIUM FONTANUM (L.) Bernh. Prof. Underwood mentions this fern as occurring at Lycoming, Pennsylvania and Springfield, Ohio. The latter locality, however, is probably an error due to confusing the labels, since the fern has never been seen growing there, and the collector to whom it is accredited can not remember it herself.

BOTRYCHIUM TERNATUM (Thunb.) Sw. All the Ohio specimens formerly included under this name are *Botrychium obliquum* Muhl. Prof. Underwood has shown* that *B. ternatum* is an Asiatic species occurring in China, Japan, and northern India, and not at all in North America.

ASPLENIUM PARVULUM TO BE ADDED.

A critical study of the specimens of *Asplenium* in the State Herbarium shows that one species is to be added to the list:

ASPLENIUM PARVULUM Mart. & Gal. A specimen of this southern fern was collected by W. A. Kellerman in Greene township, Adams county, November 7, 1900. It was at the time confused with *Asplenium trichomanes* L., and inserted in the

*Bull. Torr. Club, 25:526.

herbarium under that name. It resembles *Asplenium platyneuron* (L.) Oakes more closely but the three species are easily separated by the following characters. *A. trichomanes* has short rounded pinnæ almost or quite as broad as long, without a definite mid-vein, and without an auricle on the upper side near the base. *A. platyneuron* and *A. parvulum* have oblong pinnæ, auricled at the base, and with a definite mid-vein. In the former the pinnæ are mostly alternate, the rachis brown; in *A. parvulum* the pinnæ opposite and the rachis black. This fern, which is here reported for the first time from Ohio, is said to grow upon limestone, and ranges from Virginia to southern Ohio and Missouri, and south to the Gulf.

SPECIMENS IN THE STATE HERBARIUM (SEPT., 1904).

The following is a list of the Ohio ferns represented in the State Herbarium, with their distribution by counties.

OPHIOGLOSSUM VULGATUM L., Adder's-tongue.—Auglaize, Clark, Cuyahoga, Franklin, Lake, Lucas, Portage, Warren.

BOTRYCHIUM MATRICARIÆFOLIUM A. Br., Grape-fern.—Cuyahoga.

BOTRYCHIUM OBLIQUUM Muhl., (*Botrychium ternatum obliquum*) Grape-fern.—Ashtabula, Auglaize, Clermont, Cuyahoga, Fairfield, Franklin, Logan, Lucas, Paulding, Sandusky, Scioto, Stark, Warren, Wyandot.

BOTRYCHIUM DISSECTUM Spreng., (*Botrychium ternatum dissectum*) Grape-fern.—Auglaize, Clermont, Defiance, Delaware, Fairfield, Franklin, Lake, Logan, Sandusky, Williams, Wyandot.

BOTRYCHIUM LUNARIA (L.) Sw., Grape-fern.—Lake.

BOTRYCHIUM LANCEOLATUM (S. G. Gmel.) Angs., Grape-fern.—Portage.

BOTRYCHIUM VIRGINIANUM (L.) Sw., Grape-fern.—Auglaize, Belmont, Brown, Clark, Clermont, Clinton, Cuyahoga, Defiance, Delaware, Fairfield, Franklin, Fulton, Greene, Hamilton, Hardin, Lawrence, Lucas, Madison, Medina, Montgomery, Morrow, Ottawa, Portage, Preble, Richland, Sandusky, Trumbull, Tuscarawas, Warren, Wayne, Wyandot.

OSMUNDA REGALIS L., Flowering-fern.—Ashtabula, Clermont, Clinton, Defiance, Fairfield, Fulton, Hamilton, Hardin, Huron, Lake, Licking, Logan, Lorain, Paulding, Sandusky, Seneca, Stark, Summit, Warren, Wayne, Williams, Wood.

OSMUNDA CINNAMOMEA L., Cinnamon-fern.—Ashtabula, Auglaize, Champaign, Defiance, Erie, Fairfield, Gallia, Knox, Licking, Lorain, Lucas, Paulding, Richmond, Sandusky, Stark, Summit, Wayne, Williams, Wyandot.

OSMUNDA CLAYTONIANA L., Clayton's Fern.—Adams, Ashtabula, Belmont, Carroll, Defiance, Fairfield, Fulton, Hamilton, Hocking, Knox, Lake, Licking, Morrow, Noble, Wayne, Wood.

POLYPODIUM VULGARE L., Polypody.—Belmont, Cuyahoga, Fairfield, Greene, Hocking, Jackson, Knox, Lake, Lawrence, Licking, Lorain, Monroe, Perry, Summit, Vinton, Wayne.

POLYPODIUM POLYPODIOIDES (L.) A. S. Hitchcock, Gray Polypody.—Adams, Hamilton.

ADIANTUM PEDATUM L., Maiden-hair.—Adams, Auglaize, Belmont, Brown, Carroll, Champaign, Clermont, Clinton, Crawford, Delaware, Fairfield, Franklin, Gallia, Greene, Hamilton, Hardin, Harrison, Highland, Holmes, Huron, Jefferson, Lake, Logan, Lorain, Madison, Medina, Monroe, Morrow, Noble, Paulding, Pike, Portage, Preble, Richland, Scioto, Seneca, Vinton, Warren, Wayne, Williams.

PTERIDIUM AQUILINUM (L.) Kuhn., (*Pteris aquilina* L.) Brake.—Ashtabula, Carroll, Defiance, Erie, Fairfield, Fulton, Gallia, Harrison, Knox, Lorain, Lucas, Monroe, Paulding, Richland, Sandusky, Stark, Tuscarawas, Wayne, Williams, Wood.

PELLÆA ATROPURPUREA (L.) Link., Cliff-brake.—Adams, Clark, Franklin, Greene, Highland, Ottawa, Stark.

WOODWARDIA VIRGINICA (L.) J. E. Smith., Chain-fern.—Ashtabula, Defiance, Summit, Wayne, Williams.

ASPLENIUM PINNATIFIDUM Nutt., Spleenwort.—Fairfield, Hocking, Lawrence.

ASPLENIUM EBENOIDES R. R. Scott, Spleenwort.—Hocking.

ASPLENIUM PARVULUM Mart. & Gal., Spleenwort.—Adams.

ASPLENIUM PLATYNEURON (L.) Oakes, (*A. ebeneum* Ait.) Spleenwort.—Brown, Clermont, Defiance, Delaware, Fairfield, Gallia, Green, Jackson, Lawrence, Montgomery, Morgan, Portage, Scioto, Summit, Vinton, Wayne.

ASPLENIUM TRICHOMANES L., Spleenwort.—Ashtabula, Coshocton, Fairfield, Green, Hocking, Holmes, Knox, Lawrence, Licking, Paulding.

ASPLENIUM ANGUSTIFOLIUM Michx., Spleenwort.—Auglaize, Belmont, Clermont, Cuyahoga, Fairfield, Franklin, Gallia, Hardin, Huron, Medina, Meigs, Monroe, Portage, Preble, Seneca, Warren, Wayne, Wyandot.

ASPLENIUM RUTA-MURARIA L., Spleenwort.—Green.

ASPLENIUM MONTANUM Willd., Spleenwort.—Summit.

ASPLENIUM ACHROSTICHOIDES Sw. (*A. thelypteroides* Michx.) Spleenwort.—Belmont, Clermont, Clinton, Hardin, Hocking, Huron, Medina, Meigs, Miami, Wayne.

ASPLENIUM FILIX-FÆMINA (L.) Bernh., Lady-fern.—Adams, Auglaize, Brown, Carroll, Clermont, Clinton, Cuyahoga, Defiance, Erie, Fairfield, Fulton, Hocking, Huron, Madison, Perry, Richmond, Summit, Wayne.

CAMPTOSORUS RHIZOPHYLLUS (L.) Link., Walking-fern.—Adams, Champaign, Delaware, Fairfield, Franklin, Gallia, Green,

Highland, Holmes, Jefferson, Licking, Lorain, Meigs, Morgan, Muskingum, Pike, Portage, Scioto.

POLYSTICHUM ACHROSTICHOIDES (Michx.) Schott. (*Dryopteris achrostichoides* (Michx.) Kuntze, *Aspidium achrostichoides* Sw.) Sword-fern, Christmas-fern.—Adams, Athens, Auglaize, Belmont, Brown, Carroll, Clermont, Columbiana, Defiance, Fairfield, Franklin, Fulton, Gallia, Harrison, Highland, Hocking, Holmes, Huron, Jackson, Jefferson, Lorain, Lucas, Monroe, Morrow, Noble, Paulding, Perry, Portage, Richland, Sandusky, Scioto, Seneca, Summit, Vinton, Warren, Wayne.

DRYOPTERIS NOVEBORACENSIS (L.) Gray, (*Aspidium noveboracense* Sw.) Shield-fern.—Belmont, Defiance, Fairfield, Geauga, Hocking, Lorain, Paulding.

DRYOPTERIS THELYPTERIS (L.) Gray, (*Aspidium thelypteris* Sw.) Shield-fern.—Auglaize, Clark, Cuyahoga, Fairfield, Hocking, Lake, Licking, Lucas, Richland, Stark, Summit, Wayne, Wyandot.

DRYOPTERIS CRISTATA (L.) Gray, (*Aspidium cristatum* Sw.) Shield-fern.—Ashtabula, Champaign, Cuyahoga, Fairfield, Licking, Miami, Portage, Richland, Stark, Wayne.

DROPTERIS GOLDIEANA (Hook.) Gray, (*Aspidium goldieanum* Hook.) Shield-fern.—Clark, Cuyahoga, Fairfield, Franklin, Hardin, Lorain, Miami, Portage.

DRYOPTERIS MARGINALIS (L.) Gray, (*Aspidium marginale* Sw.) Shield-fern.—Belmont, Columbiana, Delaware, Fairfield, Gallia, Geauga, Green, Holmes, Jackson, Jefferson, Lawrence, Licking, Lorain, Monroe, Morgan, Richland, Scioto, Summit, Wayne.

DRYOPTERIS SPINULOSA (Retz.) Kuntze, (*Aspidium spinulosum* Sw.) Shield-fern.—Ashtabula, Carroll, Champaign, Clinton, Crawford, Defiance, Fairfield, Hardin, Knox, Lake, Licking, Logan, Medina, Miami, Monroe, Paulding, Seneca, Stark, Summit, Wayne, Wyandot.

DRYOPTERIS SPINULOSA INTERMEDIA (Muhl.) Underw., (*Aspidium spinulosum intermedium* D. C. Eaton) Shield-fern.—Ashtabula, Auglaize, Columbiana, Fairfield, Hamilton, Hocking, Lake, Licking, Logan, Lorain, Lucas, Summit, Wayne.

PEGOPTERIS PEGOPTERIS (L.) Underw., (*Phegopteris polypodioides* Fée) Beech-fern.—Ashtabula, Hamilton, Hocking, Mahoning, Montgomery, Summit.

PEGOPTERIS HEXAGONOPTERA (Michx.) Fée, Beech-fern.—Adams, Auglaize, Clark, Clermont, Clinton, Defiance, Fairfield, Franklin, Holmes, Jackson, Lake, Logan, Medina, Monroe, Morrow, Perry, Preble, Warren, Wyandot.

PEGOPTERIS DRYOPTERIS (L.) Fée, Oak-fern.—Ashtabula, Lake.

FILIX BULBIFERA (L.) Underw., (*Cystopteris bulbifera* (L.) Bernh.) Bladder-fern.—Adams, Ashtabula, Champaign, Clark, Clermont, Cuyahoga, Fairfield, Franklin, Highland, Hocking, Licking, Summit.

FILIX FRAGILIS (L.) Underw., (*Cystopteris fragilis* (L.) Bernh.) Brittle-fern.—Ashtabula, Auglaize, Clark, Clermont, Clinton, Fairfield, Franklin, Green, Hamilton, Hancock, Hardin, Huron, Knox, Lake, Lorain, Portage, Wayne.

WOODSIA OBTUSA (Spreng.) Torr.—Clark, Fairfield, Green, Jackson, Lawrence, Perry, Scioto.

DENNSTÆDTIA PUNCTILOBULA (Michx.) Moore, (*Dicksonia punctilobula* (Michx.) Gray, *D. pilosiuscula* Willd.) Hay-scented fern.—Ashtabula, Cuyahoga, Hocking, Miami, Scioto.

ONOCLEA SENSIBILIS L., Sensitive fern.—Ashtabula, Auglaize, Belmont, Champaign, Clermont, Clinton, Delaware, Erie, Fairfield, Fulton, Gallia, Hardin, Hocking, Huron, Jackson, Jefferson, Knox, Lucas, Madison, Medina, Morrow, Ottawa, Seneca, Stark, Summit, Vinton, Warren, Wayne, Williams, Wood, Wyandot.

Since this article was sent to press, specimens of *Mateuccia struthiopteris* (L.) Todd have been received from L. D. Stair of Cleveland.

Will you kindly send specimens of every species of your County not noted in the above list as already in the State Herbarium? They will be incorporated in the collection to the credit of the donors and collectors. Unusual forms and abundant material of the rarer species are especially solicited. Photographs of plants of any species in their natural habitats will be most welcome, and will be filed in the State Herbarium along with the specimens.
