PRELIMINARY REPORTS ON THE FLORA OF WISCONSIN. XII.

POLYPODIACEAE

EDITH W. BREAKEY AND RUTH I. WALKER

The distributional maps of this report were compiled from specimens in the herbaria of the University of Wisconsin, of the Milwaukee Public Museum, of the Field Museum (with the exception of *Athyrium* and *Thelypteris*), and of Lawrence College.

POLYPODIUM (Tourn.) L.

P. VIRGINIANUM L.; Fernald, Rhodora 24: 141, 1922. *P. vulgare* of Am. Auth. in part, not L. Common Polypody (Fig. 1). Distribution general throughout Wisconsin; most abundant on shaded ledges of rocks and woodland banks.

PTERIDIUM Raf.

P. LATIUSCULUM (Desv.) Maxon, Am. Fern Journ. 9: 43, 1919. *Pteris aquilina* of Gray's Manual, ed. 7. Common Brake. (Fig. 2.) Distribution general except for sandy areas of central Wisconsin as indicated on the distributional map and determined from figure 3, page 11 of Wisconsin Statistical Atlas 1926-27. Bulletin 90. Found in woods, often hillsides and pastures. Frequent on burnt and cut over areas.

ADIANTUM (Tourn.) L.

A. PEDATUM L. Common Maidenhair. (Fig. 3.) Generally distributed in moist shady woods with exception of sandy regions as indicated on distributional map, figure 2.

CHEILANTHES Sw.

C. FEEI Moore. Slender Lip Fern. (Fig. 4.) In dense tufts in dry crevices of rocks and cliffs. For the most part confined to lime and sandstone areas adjacent to the Wisconsin and Mississippi rivers (see fig. 5).

C. LANOSA (Michx.) Watt. Hairy Lip Fern. (Fig. 4.) Collected at St. Croix Falls.

PELLAEA Link.

P. GLABELLA Mett. ex Kuhn; Butters, Am. Fern Journ. 7: 77-87, 1917. *P. atropurpurea* of Gray's Manual, ed. 7, in part. (Fig. 5). Mostly southern. Found on dry rocky ledges of limestone, rarely on calcareous sandstone underlying such ledges. Areas of limestone are indicated on the map. (For Pallaea in fig. 5 read Pellaea.)

CRYPTOGRAMMA R. Br.

C. STELLERI (Gmel.) Prantl. Slender Cliff Brake. (Fig. 6). Confined to damp moist shaded crevices of limestone areas.

ASPLENIUM L.

A. VIRIDE Huds. Green Spleenwort. (Fig. 7). Collected but once in Wisconsin, on shaded limestone of Washington Island, Door County.

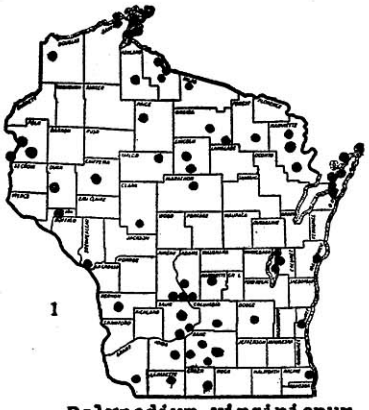
A. TRICHOMANES L. Maidenhair Spleenwort. (Fig. 8). Rocky ledges and talus of gabbro cliffs in northern Wisconsin; on limestone in Door Co.; on sandstone at the Wisconsin Dells; and on quartzite at Devils Lake.

A. PLATYNEURON (L.) Oakes. Ebony Spleenwort. (Fig 7). Rare in Wisconsin. Found in thinly wooded rocky slopes in the driftless area.

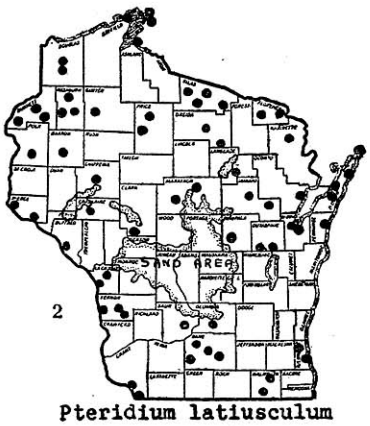
ATHYRIUM Roth ex Mertens

The members of this genus occurring in Wisconsin may be distinguished as follows:

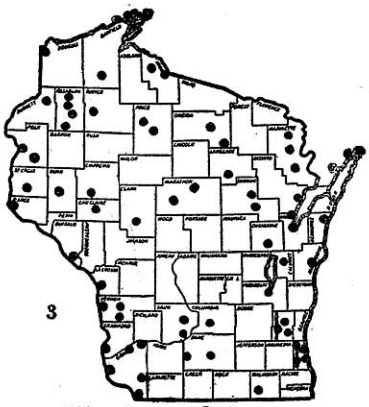
a. Indusium straight or slightly curved. *b*
  b. Fronds pinnate ..... *A. angustifolium.*
  b. Fronds pinnatifid ..... *A. acrostichoides.*
a. Indusium horseshoe-shaped or curved at one end. *c*
  c. Fronds dimorphic. *d*
    d. Longest pinnae of the fertile frond 5–12 cm. long, pinnules 4–12 mm. long, simple ..... *A. angustum* f. *typicum.*
    d. Longest pinnae of fertile front 1–2 dm. long, pinnules 12–25 mm. long, pinnatifid ..... *A. angustum* var. *elatius.*
  c. Fronds not dimorphic ..... *A. angustum* var. *rubellum.*



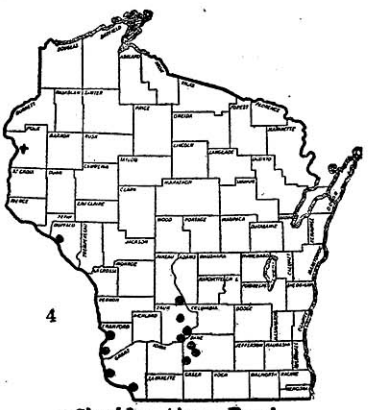
Polypodium virginianum



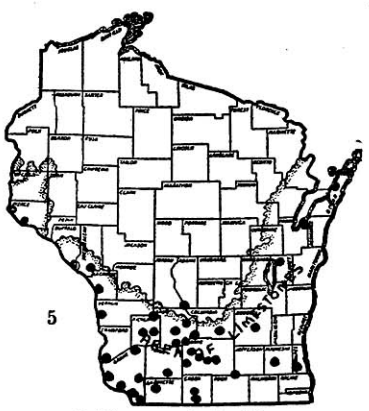
Pteridium latiusculum



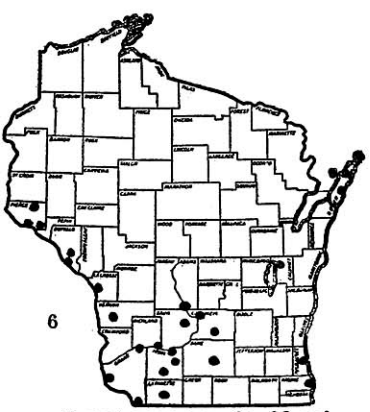
Adiantum pedatum



• **Cheilanthes Feei**
+ **Cheilanthes lanosa**



Pallaea glabella



Cryptogramma Stelleri

A. ACROSTICHOIDES Sw. Diels. Nat. Pfl. 1, pt. 2, 223, 1899. *Asplenium acrostichoides* of Gray's Manual, ed 7. Silvery Spleenwort. (Fig. 9). Occasionally found in rich, moist, shady woods.

A. ANGUSTIFOLIUM (Michx.) Milde, Bot. Zeit. 24: 376, 1866. *Asplenium angustifolium* of Gray's Manual, ed. 7. Narrow-leaved Spleenwort. (Fig. 9). Occasionally found in rich woods.

A. ANGUSTUM (Wild.) Presl, f. TYPICUM, Butters, Rhodora 19: 191, 1917. *Asplenium Filix-femina,* in part, of Gray's Manual, ed. 7. Upland Lady Fern. (Fig. 10). Not common. Forms intermediate between *A. angustum,* f. *typicum* and *A. Angustum,* var. *elatius* are indicated by crosses on the map.

A. ANGUSTUM (Willd.) Presl, var. ELATIUS (Link) Butters. Rhodora 19: 191, 1917. (Fig. 11). Distribution general throughout the state except for sandy regions as indicated in map, fig. 2. Found in swamps or in woods.

A. ANGUSTUM (Willd.) Presl, var. RUBELLUM (Gilbert) Butters. Rhodora 19: 193, 1917. (Fig. 12). Forms intermediate between *A. angustum,* var. *elatius* and *A. angustum,* var. *rubellum* are indicated by crosses on the map. Generally distributed throughout the state except for sandy regions as indicated in map, fig. 2. Found in swamps, or in rich moist or sandy woods.

CAMPTOSORUS Link.

C. RHIZOPHYLLUS (L.) Link. Walking Fern. (Fig. 13). Distribution generally southward on shaded wooded hillsides, on moss covered limestone ledges or other rocks (see fig. 5).

POLYSTICHUM Roth.

P. ACROSTICHOIDES (Michx) Schott. Christmas Fern. (Fig. 14). Collected in rocky woods at Racine.

P. BRAUNII (Spenner) Fee, var. PURSHII, Fernard, Rhodora 30: 30, 1928. Braun's Holly Fern. (Fig. 14). Found rarely in shady woods and rock slides in northern part of the state.

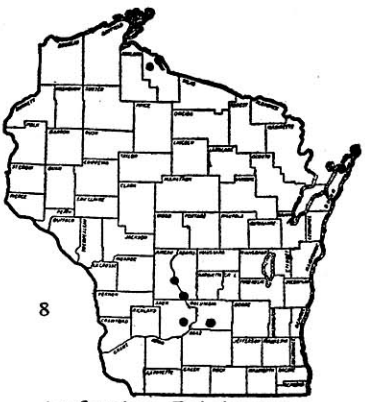
THELYPTERIS Schmidel.

Aspidium in Gray's Manual, ed 7.

T. SPINULOSA (Retz.) Nieuwl. Am. Midland Nat. 1: 226, 1910. Spinulose Shield Fern. (Fig. 15). In woods, almost anywhere except in sandy regions as indicated on map 2.

7

+ Asplenium viride
• Asplenium platyneuron



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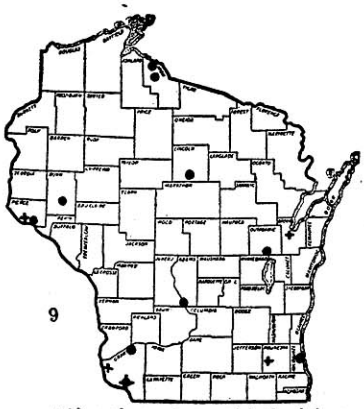
Asplenium Trichomanes



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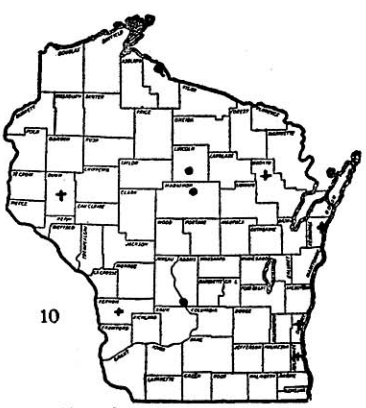
• Athyrium acrostichoides
+ Athyrium angustifolium



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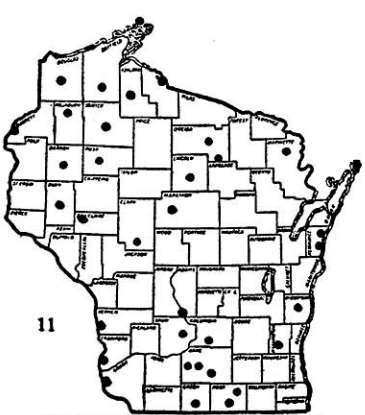
Athyrium angustum



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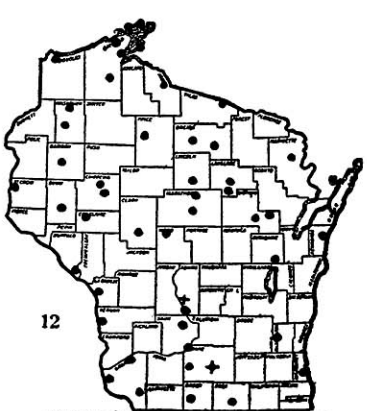
Athyrium angustum, var. elatius



12

Athyrium angustum, var. rubellum

T. SPINULOSA (Retz.) Nieuwl., var. INTERMEDIA (Muhl.) Weath. Rhodora 21: 178, 1919. (Fig. 16). Generally distributed but apparently absent from The Driftless Area. Found in deep damp caves, shaded ledges of rocks and moist woods.

According to Dr. F. K. Butters (in litt.) *T. intermedia* may be considered a distinct species, with spores averaging 25.5 × 36.2μ while in *T. spinulosa* and all its other varieties the spores average over 31 × 46μ. Measurements of twelve spores from each of 17 specimens of *T. spinulosa* in the Herbarium of the University of Wisconsin average 29.9×45.9μ. Spore measurements of twelve spores from each of 33 specimens of *T. spinulosa* var. *intermedia* average 26.30 × 37.4μ. Spore measurements of twelve spores from each of 4 specimens of *T. spinulosa* var. *americana* average 30.8 × 49.9μ.

T. SPINULOSA (Muell.) Nieuwl., var. AMERICANA (Fisch.) Weath. Rhodora 21: 178, 1919 (Fig. 19). *Aspidium spinulosum,* var. *dilatum,* f. *anadenium* of Gray's Manual, ed. 7. Not common. Found in shady woods.

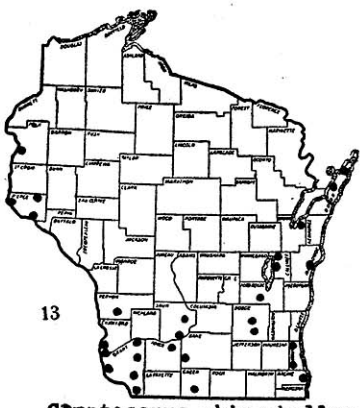
T. PALUSTRIS (Salisb.) Schott, var. PUBESCENS (Lawson) Fernald. Rhodora 31: 34, 1929. *Aspidium Thelypteris* of Gray's Manual, ed. 7. Marsh Fern. (Fig. 17). Generally distributed but rarely found in The Driftless Area. Most common in swamps, marshes and bogs.

The specimens cited as *Aspidium noveboracense* (L.) Sw. by Dr. Wm. Steil and A. M. Fuller in Am. Fern Journ. 18: 112, 1929, have been examined by the authors and are referred to the following species; *Athyrium acrostichoides, A. angustum,* f. *typicum, A. angustum,* var. *elatius, A. angustum,* var. *rubellum,* and *Thelypteris palustris,* var. *pubescens.*

T. DRYOPTERIS (L.) Slosson, in Rybd. Fl. Rocky Mts., 1044, 1917, *Phegopteris Dryopteris* of Gray's Manual, ed. 7. Oak Fern. (Fig. 18). Distribution general, usually in rocky, wet woods near rivers and lakes.

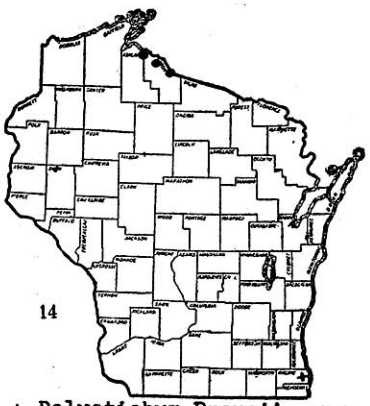
T. FRAGRANS (L.) Nieuwl., var. HOOKERIANA Fernald, Rhodora 25: 3, 1923. *Aspidium fragrans* of Gray's Manual, ed. 7. Fragrant Fern. (Fig. 19). Found only on sandstone cliffs and ledges of Wisconsin Dells, and on dry cliffs and talus slopes in northern and northwestern part of state.

T. CRISTATA L. Nieuwl. Am. Midland Nat. 1: 226, 1910. *Aspidium cristatum* of Gray's Manual, ed. 7. Crested Fern.



13

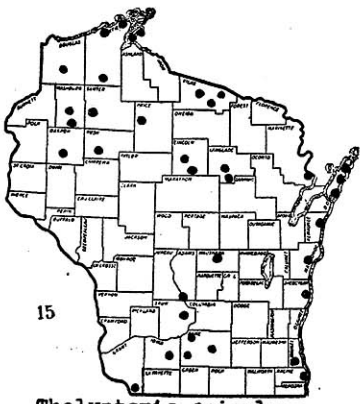
Camptosorus rhizophyllus



14

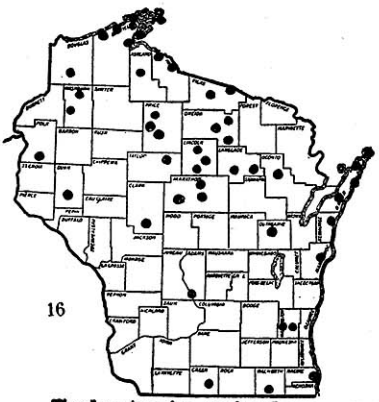
+ Polystichum Braunii, var. Purshii

• Polystichum acrostichoides



15

Thelypteris spinulosa



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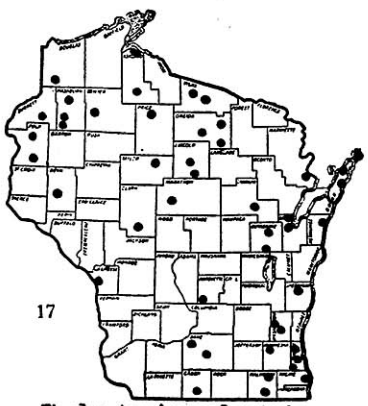
Thelypteris spinulosa, var. intermedia



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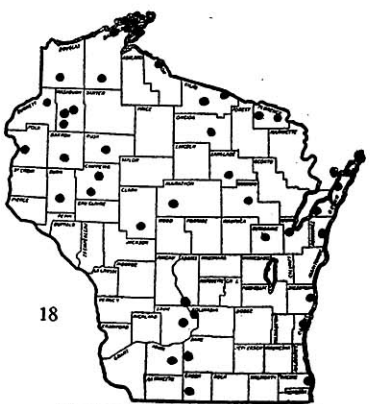
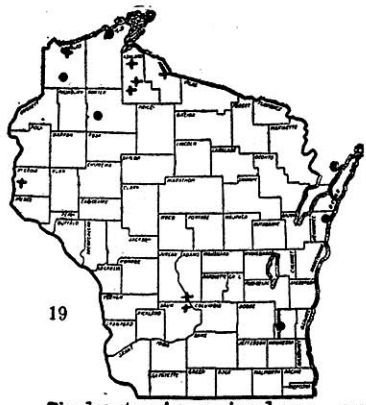
Thelypteris palustris, var. pubescens



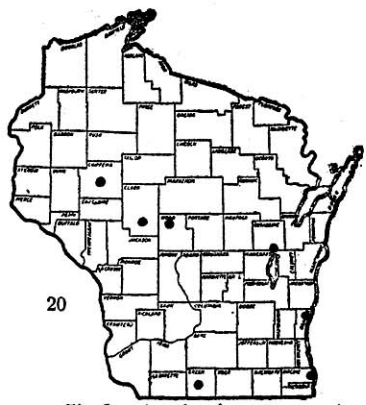
18

Thelypteris Dryopteris



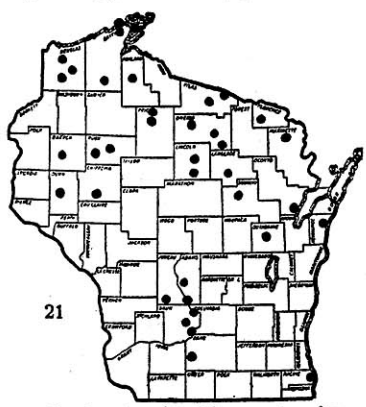
19

• Thelypteris spinulosa, var. Americana
+ Thelypteris fragrans



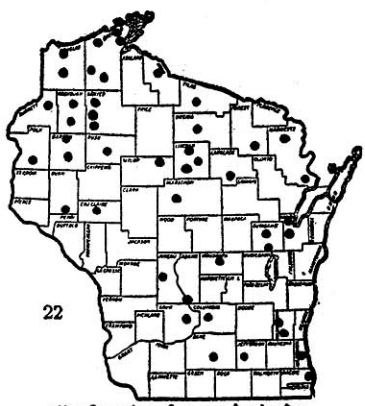
20

Thelypteris hexagonoptera



21

Thelypteris Phegopteris



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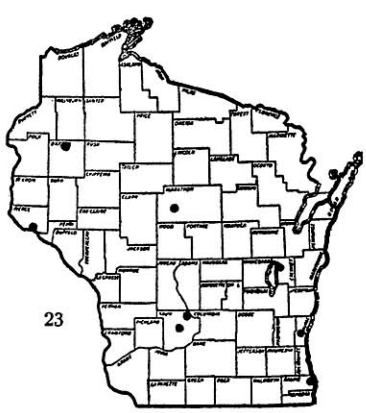
Thelypteris cristata



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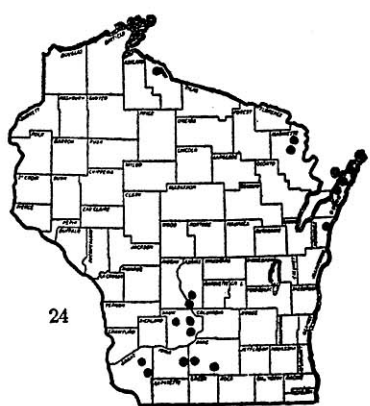
Thelypteris Goldiana



24

Thelypteris marginalis

(Fig. 22). Generally distributed except in unglaciated region in damp low ground or in marshes and swamps.

T. GOLDIANA (Hook.) Nieuwl. Am. Midland Nat. 1: 226, 1910. *Aspidium Goldianum* of Gray's Manual, ed. 7. Goldie's Fern. (Fig. 23). Not common.

T. MARGINALIS (L.) Nieuwl. Am. Midland Nat. 1: 226, 1910. *Aspidium marginale* of Gray's Manual, ed. 7. Marginal Shield Fern or Evergreen Wood Fern. (Fig. 24). Rocky ledges and hillsides in unglaciated area, also northward and north eastward.

T. HEXAGONOPTERA (Michx.) Weath., Rhodora 21: 179, 1919. *Phegopteris hexagonoptera* of Gray's Manual, ed. 7. Broad Beech Fern. (Fig. 20). Occasionally collected in dry open woods.

T. PHEGOPTERIS (L.) Slosson, in Rybd. Gl. Rocky Mts., 1043, 1917. *Phegopteris polypodioides* of Gray's Manual, ed. 7. Long Beech Fern. (Fig. 21). Distribution northward and southward in central eastern portion of state similar to that of *T. Dryopteris* (fig. 18). Found on moist shady banks of ravines and in deep woods.

WOODSIA R. Br.

W. CATHCARTIANA Robinson. Cathcart's Woodsia (Fig. 27). Dells of St. Croix River.

W. ILVENSIS R. Br. Rusty Woodsia. (Fig. 25). Distribution general. Found on rocky ledges and cliffs.

W. OBTUSA (Spreng.) Torr. Blunt-Lobed Woodsia. (Fig. 26). Not common. Distribution limited to rocky limestone areas or quartzite rock of Devil's Lake.

PTERETIS Raf.

P. NODULOSA (Michx.) Nieuwl. Am. Midland Nat. 4: 334, 1916. Onoclea Struthiopteris of Gray's Manual, ed. 7. Ostrich Fern. (Fig. 27). Generally distributed in rich wet woodlands.

CYSTOPTERIS Bernh.

C. BULBIFERA (L). Bernh. Bladder Fern. (Fig. 28). Mostly in limestone and sandstone areas on shaded hillsides and in caves.

C. FRAGILIS (L.) Bernh. Common Bladder Fern. (Fig. 29).

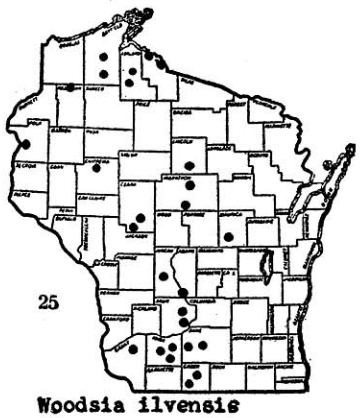
Found for most part on lime and sandstone cliffs and ledges or in moist shaded woods.

ONOCLEA L.

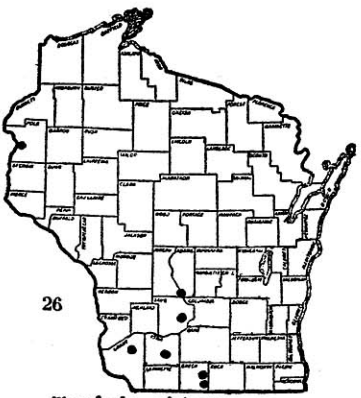
O. SENSIBILIS L. Sensitive Fern. (Fig. 30). Generally distributed in moist meadows or bogs.

O. SENSIBILIS L., forma OBTUSILOBATA (Torr.) Gilbert, N. Am. Pterid. 18, 1901. (Fig. 30). Collected only at White Lake, Langlade Co.

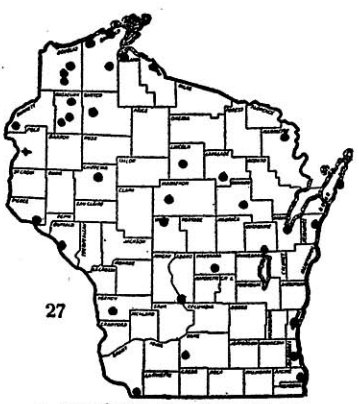
The authors wish to express their appreciation to Dr. Norman C. Fassett for his suggestions and criticism given in this work.



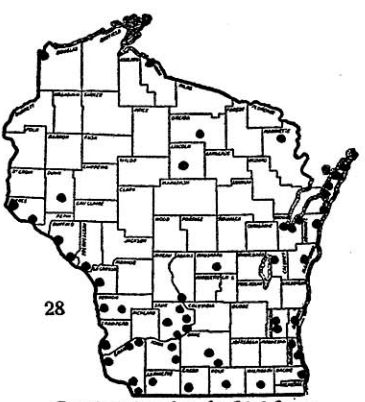
Woodsia ilvensis



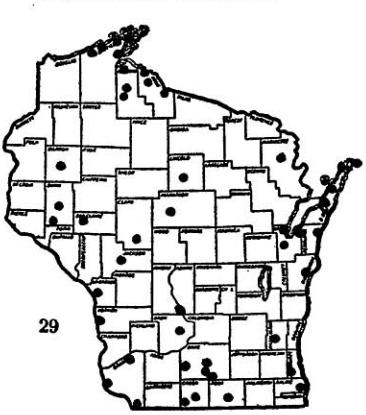
Woodsia obtusa



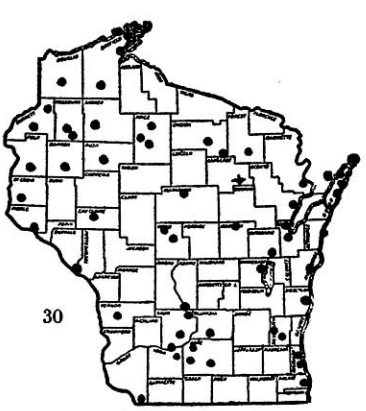
\+ Woodsia Cathcartiana
• Pteretis nodulosa



Cystopteris bulbifera



Cystopteris fragilis



Onoclea sensibilis
Onoclea sensibilis, f. obtusilobata