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"The Cyperaceae of Michigan,
Exclusive of Carex."

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Peter A. Hyypio

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THE CYPERACEAE OF MICHIGAN,
EXCLUSIVE OF CAREX

By
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INTRODUCTION

Historical Background

The history of the study of Michigan Cyperaceae probably begins in 1839, well over a hundred years ago, when John Wright (165) published a catalog listing the higher plants occurring in the two southernmost tiers of counties in the state. In this work are included the names of thirty species of cyperaceous plants, other than Carex. During the years that followed, extensive collections throughout the state were made, numerous other catalogs and lists were published, and more information became known about the species and distribution of Michigan's natural vegetation.

In 1904, Dr. W. J. Beal (46) published the catalog known as "Michigan Flora", which was a compilation of all the information available to him from various sources. These sources included numerous herbaria in the state and the publications since J. Wright's time. This catalog was supplemented in 1908, by Dr. Beal (47), with a list of additions. Although neither complete nor entirely accurate, the two works long served as an admirable source of information to anyone interested in the native vegetation of Michigan. Together, the two papers include the names of seventy-nine species and varieties of Cyperaceae, other than Carex, known to occur, or reported to occur, in the state.

Forty-three years have gone by since the list of additions to "Michigan Flora" was published. During those years no comparable work has appeared. However, many workers have published reports dealing with the flora of both previously studied, and unstudied areas of Michigan. Additional specimens have been added to the herbaria in our state and floristic knowledge has been greatly increased. Yet the sources of this information were widely scattered and studies of the literature and examination of herbarium specimens became necessary in order to obtain an accurate picture of the vegetation of Michigan.

In 1941, F. J. Hermann (132) published the results of his investigations of Michigan Carex, thus bringing up-to-date the information on that difficult genus, and making it available in one concise publication.

Fourteen other genera of Cyperaceae are included in Dr. Beal's catalog. In order to complete a modern taxonomic treatment of the entire family, the present author undertook the task of considering the remaining genera. Since the genus Carex has already been adequately covered by Dr. Hermann, its status does not concern this author and it shall not be considered in this report. Hereafter, whenever the term Cyperaceae is mentioned by the writer, it shall include all members of the family found in Michigan, except Carex.

Materials and Methods

In making this study the writer has examined all the mounted and unmounted specimens of Cyperaceae at the Michigan State College Herbarium and all the mounted specimens loaned him by the herbaria of the following institutions in our state: University of Michigan, Ann Arbor; Western Michigan College, Kalamazoo; Michigan State Normal College, Ypsilanti; and Cranbrook Institute of Science, Bloomfield Hills. In addition, he has examined the private herbarium of G. W. Prescott, East Lansing. Lack of time prevented travelling to Cranbrook Institute, to see the unmounted collection of O. A. Farwell and to Kalamazoo, to see the private collections of the Hanes. The collections at Albion College, Albion were omitted, also for lack of time.

All available published literature was searched for references to the occurrence of Cyperaceae within the borders of Michigan. The bibliography section of the bulletin "Taxonomic and Ecological Work on the Higher Plants of Michigan", by H. T. Darlington (72), proved to be invaluable in locating most of the papers that were consulted. An unpublished card file (143) of plants sent in for identification to the Department of Botany, Michigan State College, was checked for references which often were from areas of the state where no formal floristic surveys have been made.

The information derived from the above sources was entered under separate sections for each species. Under the heading "Specimens Examined", is included the following information: 1. County in which the specimen was collected. (If the collection was made on island, separated by some distance from the mainland, the name of the island, rather than the county to which it is politically attached, is given); 2. Collector's name, or "Anon" if the collector is unknown; 3. Collector's number, when known; 4. The year of collection, when known; 5. The symbol (abbreviation) of the herbarium in which the specimen is located; 6. The herbarium number of the specimen, when the collector's number is unknown and the herbarium has a numbering system.

Under the heading "Unconfirmed Reports", are listed the reports from the literature that have not been verified by actual specimens. The references are to the original lists, insofar as they were available, rather than to later references in Beal's catalog. The name of the author of the report is followed by the number which refers to the bibliography of the present paper.

The map numbers refer to the maps included in this report. They show the distribution of each species by counties and islands. The locations on the maps are of actual "Specimens Examined" and do not include any "Unconfirmed Reports".

COMMENTS ON HABITATS AND DISTRIBUTION
OF MICHIGAN CYPERACEAE

Habitat

The Cyperaceae are generally regarded as inhabitants of shores and marshes, bogs and other low, wet areas. And, to be sure, most of them actually do occur in such situations. The type of habitat in which one might expect to encounter a particular plant is included for each species in the text of this report. Yet it seems appropriate to make a few additional comments here on the subject of habitats.

One species which is often found growing in deep water, and at times completely submerged, is Scirpus subterminalis.

The common shore plants, sometimes growing in the water, include Dulichium arundinaceum, Eleocharis quadrangulata, E. equisetoides, E. acicularis, E. Smallii, Scirpus validus var. creber, S. acutus, S. americanus, S. fluviatilis, Rhynchospora macrostachya, R. capitellata and Cladium mariscoides.

Bogs serve as an abode for a large number of Cyperaceae, and a few species are almost entirely restricted to them. The latter include Scirpus cespitosus var. callosus, S. hudsonianus, Eriophorum spissum, E. gracile, E. tenellum, E. angustifolium, E. viridi-carinatum, E. virginicum, Rhynchospora alba, R. capillacea (including forma leviseta) and R. fusca. Since the environmental conditions of the

sphagnum bogs found in Michigan approach the conditions of the boreal regions of North America, many of the bog plants in our state can be considered as post-glacial relics of a flora which, soon after the final retreat of the Pleistocene ice, covered much of Michigan.

A few species of Cyperaceae are definitely upland inhabitants. Cyperus Schweinitzii, C. Houghtonii, C. filiculmis and Scirpus Clintonii are frequently found on dry sand dunes, dry banks, and on the jack-pine and scrub-oak plains of the lower peninsula. In dry, sterile meadows and thin woods of the southern part of the state, one can expect to find Bulbostylis capillaris, Fimbristylis Drummondii, and Scirpus Clintonii. In similar, but moister, situations, in the southeast corner of the state, Scleria triglomerata and S. pauciflora can be looked for.

Distributional Patterns

A look at the distributional maps of the Michigan Cyperaceae reveals some interesting facts about their distribution. Five general patterns stand out rather distinctly. They might be called the southern, the southwestern, the southeastern, the northern and the uniform, or general, distributions. One must keep in mind, when analyzing these distributions, that they are strongly affected by one misleading factor, namely, insufficient collecting in many counties. The following observations are, of necessity, crude, yet they

serve to point out that our cyperaceous flora is not uniform, but has several distributional patterns. These patterns are closely related to climate, occurrence of suitable habitats, and certainly, to many other factors that we know little or nothing about.

The southern species, for the most part, occupy that area of Michigan which lies south of a line extending due west from Saginaw Bay. Some of them have outlying stations farther north, even in the upper peninsula, in counties that border on the Great Lakes. The species occupying this area are plants whose distribution in North America is generally southern. Whether the northern limits of distribution in Michigan represent actual northern boundaries for the species, or show only the forward outposts of an active northward migration which is taking place in a relatively short, post-glacial period, is a moot question.

Others of the southern species are what D. C. Peattie (145) has discussed as the "Atlantic Coastal Plain Element" in the flora of the Great Lakes region. They represent species of plants which migrated as far as the east coast of Lake Michigan from the Atlantic Coastal Plain during the final retreat of the Pleistocene ice sheet. During this period, the shores of large glacial lakes, forerunners of our present Great Lakes, and their temporary drainage channels, supposedly formed a path of migration for many

aggressive plants, whose natural home, for ages, had been on the Atlantic Coastal Plain.

The most important members of the Cyperaceae occupying the southern area of Michigan are the following: Cyperus - all twelve Michigan species of this genus are primarily southern; Eleocharis equisetoides, E. quadrangulata, E. Robbinsii, E. olivacea, E. intermedia, E. Engelmanni, E. rostellata, Bulbostylis capillaris, Scirpus Clintonii, S. Smithii, S. Purshianus, S. subterminalis, S. fluviatilis, S. lineatus, Rhynchospora capitellata and R. globularis var. recognita.

The species whose distribution is primarily in the southwestern counties of Michigan, also include, in part, elements of the Atlantic Coastal Plain flora. The presence of the species that occur in Kalamazoo County has been discussed recently by C. R. Hanes (121). A statewide survey of Cyperaceae shows that some species listed by Hanes are quite common throughout much of Michigan. They cannot be called strictly Atlantic Coastal without raising the question of a secondary migration of them into other parts of the state.

The definitely southwestern species also include some southern species which appear to have migrated northward from Indiana and Illinois into the counties in Michigan's southwest corner.

The important Cyperaceae found mainly in this southwestern corner are Eleocharis melanocarpa, E. tricostata, Psilocarya scirpoides, Scirpus Olneyi, S. expansus, S. rubricosus, Fuirena pumila, Hemicarpha micrantha, and Rhynchospora macrostachya.

A few species appear to occur mainly in the southeastern corner of Michigan. They probably represent northern extensions of range of southern plants or eastern limits to migration of Atlantic Coastal species. These plants are Cyperus flavescens var. poaeformis, Eleocharis geniculata, Fimbristylis Drummondii, Scleria verticillata, S. pauciflora, and S. triglomerata.

Another pattern of distribution is the northern one. It includes the upper peninsula, Isle Royale and that part of the lower peninsula which lies north of the line running west from Saginaw Bay. The group of Cyperaceae occupying this area are representative of plants whose greatest distribution lies to the north, in the boreal regions of North America. Their distribution in Michigan can be considered to have been much more widespread in earlier post-glacial days and they may still be staging an "orderly withdrawal" to their northern sanctuaries.

These predominantly northern species are Eleocharis ovata, E. pauciflora var. Fernaldii, Scirpus cespitosus var. callosus, S. hudsonianus, S. rubrotinctus, S. atrocinctus, Eriophorum tenellum and Rhynchospora fusca.

Perhaps it would be best to call all species of Eriophorum and some Rhynchospora, which are quite common in bogs of southern Michigan, members of the northern flora. They persist only in areas of compensation ("privileged sanctuaries") while these habitats are still part of the Michigan landscape. When the last sphagnum bog is gone, (soon, in terms of geological time), we may expect that the flora it sheltered, shall go with it.

The foregoing discussion is short and general at best. Yet it touches upon a subject that is of great interest to the author. Further studies, carried out in the field, would certainly show many intimate correlations between Michigan's cyperaceous flora and the complicated and intriguing glacial history of the state.

TAXONOMIC TREATMENT OF THE MICHIGAN
CYPERACEAE

The basis for the taxonomic treatment of the genera and species studied in this problem has been Gray's Manual, Edition 8 (23). In the study of certain, difficult, groups the writer has consulted recent monographs and technical papers for other views on classification. Beetle's papers (1, 2, 3, 4, 5, 6, 7, 8) on Scirpus and Svenson's monographs (36, 37, 38, 40, 41) on Eleocharis were most frequently referred to.

The nomenclature the writer has used is essentially the same as is found in Gray's Manual, Edition 8. In a very few instances some other authority has been used. Under the currently accepted name are listed most of the important synonyms used by recent authors and Michigan collectors. These lists include the names of varieties that this writer has felt do not deserve separate treatment for reasons explained below. The lists of synonyms should not be construed to be complete nor, perhaps always accurate, but should be helpful only in showing what a particular plant has been called by past Michigan workers.

The question of varieties and forms has been a perplexing one. Much overlapping and intergrading of characteristics occurs between typical species and their varieties, and the accurate resolution of limits, in many cases, becomes

practically impossible. Therefore, the writer has recognized only the clearly defined varieties and forms. Confusing subspecific variants have been included under the species to which they belong and their names are listed as synonyms.

Erroneously or Doubtfully Reported Species

A number of references in the literature were found to species which do not occur in Michigan. Usually such references are based upon faulty identifications. Other species which may possibly be found in the state were not seen by this writer among the specimens he examined, consequently their presence is considered doubtful. A list of such species is included at the end of the consideration of each genus along with remarks concerning them.

Numerical Summary of Genera and Species

A total of 2641 specimens were examined during the course of the study. These specimens represented 13 genera composed of 78 species and distinct varieties and forms. This is one genus less than found in Beal's catalog. Genus Kyllinga, now placed in genus Cyperus, was not encountered among the specimens examined by the writer. Two other species included by Beal were not found. They are Scirpus polyphyllus and Cyperus refractus. Species definitely new to the state, since Dr. Beal's report, are Eleocharis geniculata and E. tricostata. Others not mentioned by him are included in the old species he reported. Revisions and new descriptions account for the fact that they are given species status in the present report.

On the following pages is found a key to the genera that occur in Michigan. After that begins the taxonomic consideration of each genus. Keys have been prepared for the species which are found in our state. They are based primarily on the keys found in Gray's Manual. Each species is considered separately in the manner already outlined under Materials and Methods.

KEY TO THE MICHIGAN GENERA

Grass-like or rush-like herbs with mostly solid stems (culms): Leaves, when present, three-ranked, with closed sheaths and narrow blades. Flowers perfect or unisexual, in spikelets; one in the axil of each of the glume-like imbricated bracts (scales, glumes). Stamens generally 3, or rarely 1 or 2, or more than 3; anthers two-celled. Ovary of 2 or 3 united carpels, but with 1 locule and 1 ovule; stigmas 2 or 3. Fruit a flattened or lenticular or three-angled achene, with a single, erect, anatropous ovule. Endosperm mealy or floury.

- A. Flowers all perfect, or at least one in each spikelet perfect.
 - B. Scales of the spikelet 2-ranked.
 - C. Inflorescences terminal, simple or compound umbels or glomerules; flowers without a perianth composed of bristles; achene without a tubercle.
 - 1. Cyperus.
 - C. Inflorescences axillary, from leaf-sheaths; flowers with a perianth composed of bristles; achene with a long tubercle.
 - 2. Dalichnium.
 - B. Scales of the spikelet spirally imbricated.
 - D. Spikelets with several to many perfect flowers.
 - E. Base of the style persistent as a tubercle on the achene.
 - F. Spikelets solitary and terminal; perianth-bristles usually present; stems naked with basal, bladeless, colored sheaths.
 - 3. Eleocharis.
 - F. Spikelets 2 to numerous; perianth-bristles none; stems leafy.
 - 4. Psilocarya.
 - G. Leaves flat; spikelets in terminal or axillary cymes; style almost wholly persistent.
 - 5. Bulbostylis.
 - G. Leaves capillary; spikelets in terminal umbels, some often crowded among the basal leaves; style-base only persistent.
 - 6. Fimbristylis.
 - E. Base of the spikelet not persistent as a tubercle.
 - H. Flowers without inner, subtending scales or dilated sepals.
 - I. Base of deciduous style enlarged; bristles none.
 - 6. Fimbristylis.
 - I. Base of deciduous style not enlarged; bristles present or wanting.
 - J. Perianth of 1--8 bristles or none.

- 7. Scirpus.
J. Perianth of very numerous, elongate, silky bristles.
- 8. Eriophorum.
H. Flowers with one or more small, inner, subtending scales (bracteoles) or dilated, sepal-like bristles.
K. Perianth of 3 slender bristles alternating with 3 stalked, petal-like scales; basal bracteoles none.
- 9. Fuirena.
K. Perianth none; flower subtended by one blunt, basal bracteole.
- 10. Hemicarpha.
D. Spikelets 1--4 flowered, polygamous with 2 to many, empty, basal scales.
L. Achene with persistent style or style-base forming a tubercle; perianth-bristles usually present.
- 11. Rhynchospora.
L. Achene without a tubercle; perianth none.
- 12. Cladium.
A. Flowers monoecious, pistillate spikelets one-flowered, usually intermixed with clusters of few-flowered staminate spikelets; achene hard, bony, with a cupule or hypogynium at the base.
- 13. Scleria.

1. CYPERUS L. Sp. Pl. 44. 1753.

A large genus with about 650 unrecognized species, distribution world-wide, centered in the tropics and subtropics. Twelve species have been found in Michigan.

Key to the Michigan Species

- A. Styles 2-cleft; achenes lenticular or plano-convex in cross-section.
 - B. Scales yellowish; achenes black, transversely wrinkled, nearly as broad as long.
 - 1. C. flavescentis
var. poaeformis.
 - B. Scales green or brown, often tinged with red or purple; achenes not transversely wrinkled, drab or brownish, longer than broad.
 - C. Styles 2-cleft almost to the base, conspicuously exerted beyond the thin, membranous, usually dull scales; achenes olive-grey.
 - 2. C. diandrus.
 - C. Styles 2-cleft only to about the middle, not conspicuously exerted beyond the firm, subcoriaceous, glossy scales; achenes brownish.

3. C. rivularis.
 A. Styles 3-merit; achenes trigonous.
 D. Fibrous rooted, usually annuals.
 E. Scales slender-tipped with a prominent, recurved awn.
4. C. inflexus.
 E. Scales mucronate, acute or obtuse, not prominently recurved or awned.
 F. Scales 1--1.5 mm. long; rachillas or spikelets persistent at maturity; rachilla-wings at maturity basally attached, scale-like and freely deciduous; achenes pearly-white, short-ellipsoid.
5. C. erythrorhizos.
 F. Scales 1.8--4.5 mm. long; rachillas of spikelets disarticulating basally or into short segments; rachilla-wings permanently adnate to the rachis; achenes not pearly-white, longer.
 G. Scales 1.8--3 mm. long; rachillas breaking into short, often 1-fruited segments; rachilla-wings broad. Thick-textured, not transparent, embracing the achenes.
 H. Each scale-tip overlapping the base of the next scale above on the same side of the rachilla; scales reddish-brown.
6. C. ferruginescens.
 H. Scale-tip barely reaching the base of the next scale above; scales yellowish-brown to reddish.
7. C. Engelmanni.
 G. Scales 3--4.5 mm. long, yellowish or golden-brown; rachillas disarticulating at the base; rachilla-wings narrow, thin, transparent, not embracing the achenes.
9. C. strigosus.
 D. Rhizomatous, tuberous, or stoloniferous perennials.
 I. Plants with slender, scaly, often tuber-tipped stolons.
8. C. esculentus.
 I. Plants with hard rhizomes or tubers.
 J. Spikelets strongly flattened, yellowish to golden-brown; scales thin, closely appressed, linear to oblong-lanceolate, 7-nerved; achenes obtusely triangular, much longer than broad.
9. C. strigosus.
 J. Spikelets terete to only slightly flattened, greenish or drab; scales firm, slightly spreading, lanceolate, oblong or ovate, 9--11-nerved; achenes sharply triangular; not more than twice as long as broad.
 K. Inflorescence a pinnately compound umbel.

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L. Culms sharply 3-angled, scabrous; cauline and involucral leaves scabrous margined; spikelets ascending; scales acute or acuminate, 2.5--3.5 mm. long; achenes twice as long as broad, 2.5--3.5 mm. long.

10. C. Schweinitzii.

L. Culms obtusely 3-angled, smooth; cauline and involucral leaves smooth; spikelets somewhat spreading-ascending; scales roundish, mucronate, 2--2.8 mm. long; achenes smaller, two-thirds as broad as long.

11. C. moughtonii.

K. Inflorescence a cluster of capitate, sessile spikelets or, if (rarely) compound, then the spikelets capitately clustered at the tip of each raceme.

12. C. filiculmis.

1. Cyperus flavescens L. var. poaeformis (Pursh) Fern.

Rhodora 41: 529--530. 1939.

Cyperus flavescens L. Sp. Pl. 46. 1753.

Cyperus poaeformis Pursh, Fl. Am. Sept. i. 50. 1814.

Yellow Cyperus. Wet, sandy soil. Rare in Michigan.

Specimens examined: WASHTENAW CO. M. W. Harrington (1869) UM. B. A. Walpole (1920) MSC 21305; F. J. Hermann 9340 (1937) UM. WAYNE CO. O. A. Farwell 2183a (1910) UM.

Unconfirmed reports: KALAMAZOO CO. C. R. & F. N. Hanes (124) KENT CO. W. J. Beal (46), N. Coleman (59), SOUTHERN MICHIGAN J. Wright (165). BERRIEN CO. P. E. Hebert (125).

Map 1.

2. Cyperus diandrus Torr. Cat. Pl. N. Y. 90. 1819.

Cyperus flavescens L. var. bicolor Farwell, Amer.

Midl. Nat. 12: 118. 1930.

Low Cyperus. Grows along shores, in wet meadows, swamps, and low grounds.

Specimens examined: BERRIEN CO. H. T. Darlington 1520 (1917) MSC. GRATIOT CO. C. A. Davis (1893) UM. JACKSON CO. S. H. & D. R. Camp (1893) MSC 21313. KENT CO. E. J. Cole (1897) UM. (1897) MACOMB CO. A. J. Pieters (1893) MSC 21312, (1893) UM, (1893) UM, (1893) UM, (1893) UM. MONROE CO. M. McDonald 5539 (1949), MSC, 5547 (1949) MSC, 5595 (1949) MSC. MUSKEGON CO. E. A. Bessey 1239 (1916) MSC. OAKLAND CO. M. T. Bingham (1935) CIS 1498.

PRESQUE ISLE CO. N. W. Katz (1939) CIS 10199. ST. CLAIR CO. C. K. Dodge (1891) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). CALHOUN CO. H. C. King & Sons (143). ALLEGAN CO. F. W. Bishop (143). KALAMAZOO CO. C. R. & F. M. Hanes (124). OAKLAND CO. O. A. Farwell (103). MANISTEE CO. F. P. Daniels (65). ST. JOSEPH CO. F. P. Daniels (66). TUSCOLA CO. C. K. Dodge (88). WAYNE CO. O. A. Farwell (90), (103).

Map 2.

3. Cyperus rivularis Kunth, Enum. 2:6. 1837.

Cyperus flavescens L. var. castaneus Pursh, Fl. Am. Sept. 1: 52. 1814.

Shining Cyperus. Found on low, wet grounds, along lake-shores and in marshes.

Specimens Examined: ALLEGAN CO. C. H. Kauffman (1931) UM. BARRY CO. S. B. Hedges 63 (1950) MSC. BEAVER ISLAND C. F. Wheeler (1900) MSC 93987. BERRIEN CO. G. L. Ames (1867) UM. CASS CO. H. S. Pepoon 107 (1904) MSC, 664 (1906) MSC; F. C. Gates 1363 (1906) UM, 1730 (1906) UM. DELTA CO. R. McVaugh 11178 (1949) CIS, 11178 (1949) UM. GRATIOT CO. C. A. Davis (1890) MSC 21382, (1890) UM, (1890) UM, (1890) UM, (1893) UM, (1897) CIS 10500. INGHAM CO. Anon. (1887) MSC 21274; Anon. (1887) MSC 21324. JACKSON CO. G. H. Hicks (1892) MSC, (1893) MSC 21311. KALAMAZOO CO. L. A. Kenoyer (1930) WMC, (1931) WMC; V. Janson 19 (1950) MSC. KENT CO. E. J. Cole (1893) MSC 21310, (1897) UM; Anon. (1896) MSC 21275. LENAWEE CO. W. J. Beal MSC 93981. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACOMB CO. D. D. Cooley (1848) MSC 93985, (1849) MSC 93982; A. J. Pieters (1893) UM. MENOMINEE CO. C. O. Grassl *2637 (1932) UM, *2783 (1933) UM, 2, 3306 (1933) UM, 2, 3309 UM. MIDLAND CO. R. R. Dreisbach 6219 (1922) UM. MONROE CO. Sister Vincent de Paul (1938) UM. MONTCALM CO. E. Barlow (1900) MSC 21315. MUSKEGON CO. C. D. McLouth (1898) MSC 93760. NEWAYGO CO. C. W. Bazuin 3890 (1941) CIS. OAKLAND CO. C. Billington (1916) UM; M. T. Bingham (1934) CIS 1499, (1936) CIS 1500. ST. CLAIR CO. C. K. Dodge (1891) UM, (1896) UM, 1075 (1986) MSC, (1903) UM; O. A. Farwell 6749 (1923) UM, 6749 (1923) UM. WASHTENAW CO. A. R. Wheeler 3029 (1891) UM; (W. A. Rusn ?) (1891) UM; C. Billington (1917) UM, (1919) WMC; E. A. Waipole (1918) UM; O. A. Farwell 5343 (1919) UM, 5343 (1919) UM; F. G. Gustafson (1922) UM; F. J. Hermann 6435 (1934) UM, 824 (1937) UM; C. O. Grassl *7753 (1937) UM; R. McVaugh 7568 (1946) UM; E. C. Almendinger UM. WAYNE CO. O. A. Farwell (1892) UM, (1903) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). CHEBOYGAN CO. F. C. Gates (110). KALAMAZOO CO. C. R. & F. M. Hanes (124). TUSCOLA CO. C. A. Davis (77). ST. JOSEPH CO. F. P. Daniels (66).

Map 3

4. Cyperus inflexus Muhl. Gram. 16. 1817.
Cyperus aristatus of some American authors, not of
 Rottb. 1773.
Cyperus aristatus var. inflexus (Muhl.) Kuk. Pflanzenr.
 101 (IV. 25): 504. 1936.

Awne Cyperus. Usually found along moist stream and
 river banks. Rare in Michigan.

Specimens examined: BERRIEN CO. G. L. Ames (1867) UM.
GRATIOT CO. C. A. Davis (1895) MSC 21343. INGHAM CO. C. F.
 Wheeler (1891) MSC 21344, (1891) CIS 1411; G. D. Bones (1891)
 UM; G. H. Hicks (1896) MSNC. IONIA CO. C. F. Wheeler (1887)
 UM, (1887) MSC 21348. KENT CO. C. W. Bazuin 4243 (1941) CIS,
 4255 (1941) CIS. MENOMINEE CO. C. O. Grassl 2915 (1933) UM,
 2915 (1933) UM, 2915 (1933) JM.

Unconfirmed Reports: KENT CO. E. J. Cole (58), N. Coleman (59).

Map 4.

5. Cyperus erythrorhizos Muhl. Gram. 20. 1817

Red-rooted Cyperus. A plant of moist stream banks and
 borders of ponds as well as in other wet and marshy places.

Specimens Examined: ALLEGAN CO. D. L. Allen (1937) MSC.
GRATIOT CO. C. A. Davis (1895) MSC 21281, (1894) MSC 21282,
 (1894) MSC 21290, (1894) UM, (1894) UM, (1895) UM, (1895)
 MSC 21284. INGHAM CO. C. F. Wheeler (1890) MSC 21288, (1890)
 MSNC, (1897) MSC 21293. KALAMAZOO CO. L. A. Kenoyer (1930)
 WMC. MACOMB CO. D. D. Cooley 88 (1844) MSC, (1844) MSC 21287.
MONROE CO. M. McDonald 5440 (1949) MSC, 5543 (1949) MSC.
OAKLAND CO. O. A. Farwell 7220 (1924) UM, 7220 (1924) UM.
VAN BUREN CO. L. H. Bailey (1880) MSC 21292. WASHTENAW CO.
 J. H. Enlers 5505 (1933) UM, 5505 (1933) UM; F. J. Hermann
 9271 (1937) UM. WAYNE CO. M. McDonald 5622 (1949) MSC.

Unconfirmed Reports: BAY CO. W. J. Beal (46) KALAMAZOO CO.
 C. R. & F. N. Hanes (124). OAKLAND CO. M. T. Bingham (51).
ST. JOSEPH CO. F. P. Daniels (66).

Map 5.

6. Cyperus ferruginescens Boeckl. Linnaea 36:396. 1869--70.
Cyperus terax of some American authors, in part; not
 of L. C. Rich. 1792.
Cyperus speciosus of some American authors, in part;
 not of Vahl 1806.
Cyperus micnauxianus of some American authors; not
 of Schultes 1824.

Coarse Cyperus. Found on wet, sandy soil, mudholes,
 river banks, in city dumps and on railroad ballast.

Specimens Examined: GRATIOT CO. C. A. Davis (1893) MSC 21380. KALAMAZOO CO. F. A. Tutnill (1873) UM; F. W. Rapp 6863 (1945) CIS. MCAROE CO. C. Billington (1917) WMC, (1917) CIS 1503; C. A. Farwell 4568 (1917) UM. CARLISLE CO. O. A. Farwell 4568 (1917) UM; M. T. Bingham (1934) CIS 1503. ST. CLAIR CO. S. A. Cain (1948) CIS 11318. WASHTENAW CO. E. C. Almendinger UM; F. J. Hermann 8371 (1916) UM; B. A. Walpole (1918) UM. WAYNE CO. C. Billington (1914) CIS 1513. Unconfirmed Reports: ALGER CO. C. F. Wheeler (160). BERRIEN CO. P. E. Hebert (125). CLINTON CO. W. J. Beal (46). GENESEE CO. W. J. Beal (46). KENT CO. C. W. Bazuin (44), E. J. Cole (58). MUSKEGON CO. C. W. Bazuin (44). OTTAWA CO. C. W. Bazuin (44).

Map 6.

7. Cyperus Engelmanni Steud. Syn. Pl. Cyp. 47. 1855.

Engelmann's Cyperus. Grows along river banks, pond and lake shores, in moist sandy swamps and on other low grounds.

Specimens Examined: CASS CO. H. S. Pepoon 905 (1906) MSC. CLINTON CO. C. F. Wheeler (1890) MSC 21279; G. Lauff 44 (1950) MSC. INGHAM CO. C. F. Wheeler & G. H. Hicks (1893) MSC 21323; C. Billington (1924) UM, (1924) WMC. KALAMAZOO CO. L. A. Kenoyer (1930) WMC. KENT CO. C. W. Bazuin 2111 (1940) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACOMB CO. A. J. Pieters (1893) UM, (1893) UM. MCAROE CO. O. A. Farwell 4568 (1917) UM; M. McDonald 2439 (1949) MSC. MUSKEGON CO. E. A. Bessey 1238 (1916) MSC. OAKLAND CO. O. A. Farwell 4568 (1917) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (58). MUSKEGON CO. W. J. Beal (46). ST. CLAIR CO. C. K. Dodge (79).

Map 7.

8. Cyperus esculentus L. Sp. Pl. 45. 1753.

Cyperus pnymatodes Muhl. Gram. 23. 1817.

Cyperus esculentus var. leptostachyus Boeck. Linnaea 36:29. 1870.

Cyperus esculentus var. angustispicatus Britt. Bul. Torrey Club 13:211. 1886.

Yellow Nut-grass. Usually grows on low, wet grounds, propagating itself by both seed and tubers. Often it becomes a very troublesome weed on cultivated land and very difficult to control (73). Two varieties of the species have been reported by Michigan collectors but close examination and comparison of numerous specimens have left the writer with the impression that the differences are due to the age and robustness of the individual plants.

Specimens Examined: BERRIEN CO. H. T. Darlington 1348 (1917) MSC. GRATIOT CO. C. A. Davis (1890) MSC 21314, (1890) UM. HOUGHTON CO. P. A. Aypio 144 (1950) MSC. INGHAM CO. C. F. Wheeler (1893) MSC 21317, (1890) MSC 21321, (1892) MSC 61554. IOSCCO CO. W. J. Beal & C. F. Wheeler (1883) MSC 21318. KALAMAZOO CO. F. A. Tutnill (1873) UM. KENT CO. G. D. Sones (1891) UM; E. J. Cole (1894) UM; J. Shaddick & H. C. Skeels (1896) MSC 21319. LACOLE CO. A. J. Pieters (1893) UM; C. K. Dodge (1911) UM. MCNROE CO. O. A. Farwell 7801 (1926) UM, 7801 (1926) UM; L. McDonald 5006 (1947) MSC, 5082 (1949) MSC. OAKLAND CO. O. A. Farwell 5060 (1918) UM, 5060 (1918) UM. ST. CLAIR CO. C. K. Dodge (1892) UM, (1915) UM, (1915) CIS 1504; O. A. Farwell 7258 (1924) UM, 7258 (1924) UM. ST. JOSEPH CO. H. T. Darlington 1601 (1917) MSC. SMIAGASSEE CO. G. H. Hicks (1890) MSC, (1890) MSC 21320. WASHTENAW CO. J. H. Enlers 3796 (1928) UM; F. J. Hermann 9170 (1937) UM. WAYNE CO. O. A. Farwell (1903) UM, 4659 (1917) UM, 4659 (1917) UM; C. Billington (1917) UM.

Unconfirmed reports: ALLEGAN CO. A. Bentall (143), Mrs. H. W. Masters (143). ALPENA CO. C. A. Elivin (143). ARENAC CO. T. Tremble (14). BERRIEN CO. C. Billington (48); D. L. Boardman (143). CALHOUN CO. L. D. Sears (143). CLARE CO. A. J. Chappell (143). CLINTON CO. L. A. Scoriold (143); Mrs. J. A. Thompson (143). EATON CO. R. G. Tower (143); H. Kardel (143). GENEESE CO. W. J. Beal (46); Muirler Bros. (143); C. Blasner (143). GLADWIN CO. A. Chubb (143). GRAND TRAVERSE CO. C. A. Hemstreet (143). GRATIOT CO. F. Biddlecome (143); J. Meyer (143). HILLSDALE CO. G. R. Hinkle (143); F. W. Bishop (143). HURON CO. W. C. Volz (143); E. L. Raven (143). INGHAM CO. E. Church (143). IONIA CO. W. J. Beal (46); A. L. Brown (143). ISABELLA CO. C. W. Onderkirk (143). JACKSON CO. Anon. (143). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. K. K. Vining (143). LAKE CO. A. J. Drilling (143). LENAWEE CO. C. E. Preston (143); H. N. Chapel (143). LIVINGSTON CO. J. J. Donahue (143); C. L. Bolander (143). MIDLAND CO. Dow Chemical Co. (143). MCNROE CO. M. C. Thomas (143); R. Carr (143). MONTCALM CO. V. C. Beal (143); J. McClelland (143). OAKLAND CO. W. Caruova (143). OCEANA CO. W. S. Bettys (143). OTTAWA CO. H. W. Haddock (143); H. Wesseldyk (143); C. Alcumrock (143); K. East (143). SAGINAW CO. R. Hart (143); A. G. Boyay (143); H. F. Stingel (143). SANILAC CO. J. D. Martin (143). TUSCOLA CO. C. K. Dodge (88); C. A. Davis (77); H. M. Underwood (143). VAN BUREN CO. R. W. Evans (143); W. C. Eckard (143). WASHTENAW CO. G. W. Gage (143); E. Adam (143). WAYNE CO. E. A. Eichstedt (143); Michigan Farmer (143). SOUTHERN COUNTIES OF MICHIGAN J. Wright (165).

Map 8.

9. Cyperus strigosus L. Sp. Fl. 47. 1753.

Cyperus strigosus var. robustior Britt. Bul. Torrey Club 13; 221. 1816.

Cyperus strigosus var. capitatus Britt. l.c.

Cyperus strigosus var. compositus Britt. l.c.

Straw-colored Cyperus. Found in all types of habitats except heavily shaded woods or forests. Some Michigan collectors have recognized as varieties some specimens of this species but the writer feels that the relative age and size may have formed the basis for such separations. They are all included here as not being distinct from the species.

Specimens Examined: ALGER CO. C. F. Wheeler 181 (1900) MSC. EMERY CO. S. E. Hedges 48 (1930) MSC, 64 (1930) MSC. BAY CO. G. W. Bradford (1890) MSC, (1900) MSC. CALHOUN CO. W. J. Beal (1898) MSC 21377. CASS CO. D. Doughton (1898) UM; H. S. Pepoon 139 (1904) MSC; F. C. Gates 1408 (1906) UM. GRATIOT CO. C. A. Davis (1898) MSC 18287, (1898) MSC 21381. HURON CO. C. A. Davis (1898) MSC 21380, (1898) MSC 21381, (1896) MSC 21368, (1898) MSC 21372. INGHAM CO. Anon. (1887) MSC 21368; C. F. Wheeler (1890) MSC 93732; W. R. Keuzie (1898) MSC 21329; F. A. Loew (1904) MSC; M. Craig 1877 (1905) MSC; E. Schmitt (1925) MSC; T. H. P. Marshall 987 (1949) MSC. JACKSON CO. G. H. Hicks (1893) MSC 21362, (1895) MSC 21365. KALAMAZOO CO. L. A. Kenoyer (1930) WMC, (1932) WMC; C. R. Hanes UM; F. C. Nuggett 153 (1933) MSC. KENT CO. E. J. Cole (1897) UM, (1899) UM; D. L. Bailey (1898) UM; C. W. Bazuin 7 (1938) MSC, 12 (1938) MSC, 18 (1939) MSC, 122 (1939) CIS, 1935 (1940) MSC. LENAPE CO. Mrs. J. T. Boyce 14 (1905) MSC. MACOMB CO. D. D. Cooley (1845) MSC 21375, (1847) MSC 21374; A. J. Pieters 54 (1893) MSC, (1893) UM, (1893) UM. MARQUETTE CO. C. O. Grassl 7945 (1935) UM. MONROE CO. O. A. Farwell 7807 (1926) UM, 7806 (1926) UM; W. McDonald 5152 (1945) MSC, 5235 (1949) MSC, 5538 (1949) MSC, 5546 (1949) MSC, 5070 (1949) MSC. MONTCALM CO. C. A. Davis (1895) UM, (1895) UM. MUSKEGON CO. C. D. McLouth (1894) MSC, 76 (1894) MSC; C. W. Bazuin 5872 (1943) CIS. NEWAYGO CO. C. W. Bazuin 3733 (1941) CIS, 3733 (1941) CIS. OAKLAND CO. O. A. Farwell 4568 (1917) UM; M. T. Bingham (1936) CIS 1502; (1934) CIS 1515, (1934) CIS 1516; T. H. P. Marshall 871 (1949) MSC. ST. CLAIR CO. C. K. Dodge 959 (1896) MSC, 960 (1900) MSC, (1891) UM, (1898) UM, (1900) UM; O. A. Farwell 7263 (1924) UM. VAN BUREN CO. H. S. Pepoon 370 (1905) MSC. WABSHENAW CO. Anon. (1898) UM; O. A. Farwell 5352 (1919) UM; C. Billington (1919) WMC; E. A. Walpole (1921) MSC 21307; F. G. Gustafson (1922) UM; F. J. Hermann 5506 (1933) UM, 9111 UM; C. O. Grassl 7945 (1935) UM. WAYNE CO. A. B. Lyons (1875) UM; J. M. Sutton 177 (1916) UM; C. Billington (1916) WMC; O. A. Farwell (1917) CIS 1514,

(1917) CIS 1518, (1917) CIS 1519, 4591 (1917) UM, 4665 (1917) UM, 4666 (1917) UM, 4668 (1917) UM; M. McDonald 3306 (1949) MSC.

Unconfirmed Reports: BERRIEN CO. F. E. Hebert (125); C. E. Whiten (143). CALHOUN CO. F. H. Lee (143). KALAMAZOO CO. C. R. & F. H. Hanes (124). OTTAWA CO. J. M. Visscher (145). OSCEOLA CO. C. A. Davis (77); C. K. Dodge (88). SOUTHERN COUNTIES OF MICHIGAN J. Wright (165).

Map 9.

10. Cyperus Schweinitzii Torr. Ann. Lyc. N. Y. 3:276. 1836.
Cyperus alternifolius Schwein. Long, Exped. Winnep.
 2:381. 1824.

Schweinitz's Cyperus. Found on both wet and sandy soils, in such habitats as sand dunes, sandy plains and lake shores.

Specimens Examined: ALLEGAN CO. C. F. Wheeler (1896) MSC 21357, (1896) UM; C. Billington (1917) CIS 1512, (1917) WMC; BERRIEN CO. H. T. Darlington 1608 (1917) MSC, 1274 (1917) MSC. CALHOUN CO. First State Survey (1835) UM, (1835) UM. DELTA CO. C. O. Grassl 7947 (1934) UM, 7947 (1934) UM, 7947 (1934) CIS. HURON CO. C. K. Dodge (1903) UM. KALAMAZOO CO. C. R. Hanes (1936) UM. MCNAB CO. B. A. Walpole (1920) MSC 21306; O. A. Farwell 4574 (1917) UM, 4574a (1920) UM, 4574b (1924) UM, 7795 (1926) UM, 7795 (1926) UM. MUSKEGON CO. C. D. McLouth 34 (1894) MSC, (1894) MSNC; E. A. Tessey 1147 (1916) MSC, 1133 (1916) MSC. NEMAYGO CO. C. W. Bazuin 4116 (1941) CIS; R. McVaugh 9846 (1945) CIS, 9846 (1945) UM. OTTAWA CO. C. H. Kauffman (1910) UM; C. W. Bazuin 626 (1939) MSC. ST. CLAIR CO. C. K. Dodge (1902) UM. COUNTY UNKNOWN M. Clarke UM.

Unconfirmed Reports: ALLEGAN CO. Anon. (143). BERRIEN CO. P. E. Hebert (125). GRAND TRAVERSE CO. C. H. Hemstreet (143). KALAMAZOO CO. W. J. Beal (46). MANISTEE CO. F. P. Daniels (65). OCEANA CO. C. H. Hemstreet (143). OSCEOLA CO. H. G. Stanton (143). VAN BUREN CO. W. J. Beal (46). WEXFORD CO. J. Macne (143).

Map 10.

11. Cyperus Houghtonii Torr. Ann. Lyc. N. Y. 3: 277. 1836.

Houghton's Cyperus. Generally found on dry sands of dunes and sandy roadsides and in the Jack Pine plains.

Specimens Examined: ALPENA CO. C. F. Wheeler (1896) MSC 21302. ARENAC CO. C. F. Wheeler (1900) MSC 93762, (1900) MSC 21395, (1900) MSC 21339, (1900) MSC 21327, (1900) MSC 21328. BAY CO. C. A. Davis (1900) CIS 10432, (1900) UM, (1900) UM. BERRIEN CO. C. Billington (1917) CIS 1510. CHEBOYGAN CO. C. F. Wheeler (1890) MSC 93756; F. C. Gates 270 (1911) MSC; J. H. Enlers 1184 (1920) MSC, 213 (1913) MSC, 1184 (1920) UM,

1792 (1921) UM, 2213 (1932) UM, 4660 (1930) UM, 6290 (1937) UM. DELTA CO. C. F. Wheeler (1892) MSC 21359. HURON CO. C. A. Davis (1896) MSC 21360, (1896) MSC 21365, (1896) MSC 21364, (1896) CIS 10547, (1896) UM. IOSCCO CO. W. J. Beal & C. F. Wheeler (1893) MSC 21303; G. A. Loughridge 4195 (1944) CIS. KALAMAZOO CO. R. S. Snaw 174 (1932) MSC. KENT CO. Anon. 535 (1939) MSC. MENOMINEE CO. C. C. Grassl 2844 (1933) UM, 2893 (1933) UM. MONTMORENCY CO. R. McVaugh 11061 (1949) UM. ST. CLAIR CO. C. K. Dodge 111 (1892) MSC, (1892) UM, (1892) UM, 957 (1902) MSC, (1902) CIS 1511.

Unconfirmed Reports: KENT CO. C. W. Eazuin (44).
OAKLAND CO. M. T. Bingham (51).

Map 11.

12. Cyperus filiculmis Vahl, Enum. 2:328. 1806.
Cyperus bushii Britt. Man. (1044 (as to type). 1901.
Cyperus filiculmis var. macilentus Fern. Rhodora
8:123. 1906.

Slender Cyperus. A plant of dry, open fields, sparse open woods and sandy situations. Numerous specimens of this species are often called var. macilentus but those that the writer has looked at seem to him to be either young or weak members of the typical species, usually still in blossom, so that accurate measurements of the achenes cannot be made. The author, therefore, has chosen to include all of them under the species.

Specimens Examined: ARENAH CO. C. F. Wheeler 349 (1900) MSC. BEY CO. G. M. Bradford (1900) MSC, (1901) MSC. INGHAM CO. C. F. Wheeler (1892) UM, (1892) MSC. IONIA CO. G. W. Parmelee (1939) MSC. IOSCCO CO. W. J. Beal & C. F. Wheeler (1893) MSC 21301; C. L. Gilly & G. W. Parmelee G&P 202 (1949) MSC. KENT CO. G. D. Sones (1891) UM; E. J. Cole (1894) MSC 21304; C. W. Eazuin (1938) MSC, 154 (1939) MSC. LAKE CO. R. McVaugh 9800 (1948) UM, 9800 (1948) CIS. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACOMB CO. Anon. (1893) MSC 21340; A. J. Pieters (1893) UM. MANISTEE CO. O. A. Farwell 3845 (1914) UM. MENOMINEE CO. C. C. Grassl 3, 2893 (1933) UM. MONROE CO. O. A. Farwell 8085 (1927) UM, 8085 (1927) UM, 8085 (1920) UM. MONTCALM CO. B. Darlow (1900) MSC 21295. NEWAYGO CO. H. T. Darlington 1111 (1916) MSC; R. McVaugh 9838 (1948) UM. R. S. Hauser (1949) MSC. OAKLAND CO. O. A. Farwell 4546 (1917) UM, 5584c (1927) UM, (1920) UM; C. Billington (1919) MSC, (1914) CIS 1507, (1923) UM; M. T. Bingham (1935) CIS 1509, (1935) CIS 1509, (1935) CIS 1508, (1936) 1507. TUSCULA CO. C. A. Davis (1897) MSC 21302. ST. CLAIR CO. C. K. Dodge (1899) MSC 21334, (1900) UM. VAN BUREN CO. H. S. Pepton 105 (1903) MSC, 895 (1906) MSC. WASHINGTON CO. Anon. (1869) UM; Anon. (1869) UM; Anon. (1873) UM; E. A. Walpole (1918) UM; F. G. Gustafson (1922) UM; R. McVaugh 7593 (1946) UM; C. C. Grassl

7755 (1937) UM. WAYNE CO. O. A. Farwell 1189a (1894) UM; J. M. Sutton (1916) UM; C. Billington (1917) UM; M. McDonald 5217 (1943) UM.

Unconfirmed Reports: BERRIA CO. P. E. Hebert (125). CHIPPEWA CO. C. K. Dodge (37). IRON CO. C. K. Dodge (30). KALAMAZOO CO. C. R. & F. N. Hanes (124). MANISTEE CO. F. P. Daniels (85). OSCEOLA CO. C. K. Dodge (85). ST. JOSEPH CO. H. J. Lurkins (143).

Map 12.

Species of *Cyperus* Doubtfully or Erroneously Reported for Michigan

Cyperus refractus Engelm. This species is included by Beal (46) in "Michigan Flora" as being found in Detroit by Farwell. The writer has not discovered such a specimen among any collections by Farwell nor found any reference to it in any of Farwell's publications. The species is said to occur as follows in Gray's Manual (25), "N.J. to Ky., s. to Ga., Tenn. and Mo.". This, almost certainly, excludes Michigan. It seems, therefore, appropriate at this time to exclude *Cyperus refractus* from the list of Cyperaceae in Michigan, at least until its present or past occurrence is established definitely.

Cyperus rotundus L. Although no one has reported or collected this species in Michigan, there is in the University of Michigan herbarium one specimen bearing the label of the Herbarium of the University of Michigan with the legend, "*Cyperus strigosus* L. Niles, Mich. Geo. L. Ames." The specimen has later been identified correctly as *C. rotundus*, by Hugh O'Neill. Closer examination of the sheet itself reveals the original inscription, which reads "Wilcox Co. Ala. Estate of A. Jewett, M.D." It appears most certainly to be an Alabama collection and not one from Niles, Michigan.

Cyperus tenuifolius (Steud.) Dandy. (*C. densicaespitosus* Mattf. & Kuhn; *Kyllinga pumila* Michx.) This species was originally reported by Dr. Lyons as occurring in southern Michigan and the report is carried in Beal's list of 1904 (46). Later, in 1924, E. A. Walpole includes *Kyllinga pumila* in his Flora of Washtenaw County. (156). He says, "Moist places; frequent. Hatch Farm, Ypsilanti Twp." There is a strong possibility that the species occurs in Michigan for it is found in the central counties of Indiana (11) and it may well be found sparingly in our southern counties.

2. *DULICHNIUM* pers. Syn. 1: 65. 1805.

This monotypic genus has its single species confined to North America.

Dulichium arundinaceum (L.) Britt. Bul. Torrey Club
21:29. 1894.

Cyperus arundinaceus L. Sp. Pl. 44. 1753.

Dulichium spatnaceum (L.) Pers. Syn. 1:65. 1805.

Dulichium. Usually found in bogs, marshes, along lake shores and streams. Often growing in shallow water. Occurs in all parts of the state.

Specimens Examined: ALPENA CO. H. T. Darlington (1918) MSC 21384. BLAVER ISLAND M. C. Ries 913 (1932) CIS. BERRIEN CO. G. L. Ames (1867) UM. BOIS BLANC ISLAND M. T. Bingham (1935) CIS 1524. BRAZOS CO. Anon. (1837) UM; Anon. (1837) UM; Anon. (1837) UM. CASS CO. H. S. Pepoon 102 (1904) MSC. CHEBOYGAN CO. F. C. Gates 223 (1911) MSC; J. H. Enlers 1001 (1920) MSC, 1001 (1920) UM, 1614 (1921) UM; W. Katz (1937) CIS 10263; S. A. Cain & F. Segadas Vianna (1948) CIS 11326; T. H. P. Marshall 741 (1949) MSC. CHIFFEWA CO. F. J. Hermann 7086 (1938) UM; 7086 (1938) MSC; R. McVaugh 8820 (1947) UM, 8820 (1947) CIS. CRAWFORD CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11325. DELTA CO. C. L. Gilly & G. W. Parmelee G&P 143 (1949) MSC. GOGHEIC CO. H. T. Darlington B&D 2464 (1919) MSC, B&D 2464 (1919) UM. GRATIOT CO. C. A. Davis (1890) MSC 21393, (1890) CIS 10479, (1890) UM, (1890) UM; G. H. Hicks (1890) MSC 21392. HOUGHTON CO. C. D. Richards 1181 (1948) UM. INGHAM CO. Anon. (1871) MSC 61549. ISLE ROYALE A. E. Foote (1868) UM; J. B. McFarlin 2164 (1930) UM; H. Bagglely (1948) MSC. JACKSON CO. Anon. UM. (1838) UM. KALAMAZOO CO. Anon. (1838) UM; C. W. Bazuin (1937) CIS 12244; S. A. Cain et al. (1948) CIS 12957. KENT CO. E. J. Cole (1894) MSC 21391; C. W. Bazuin (1938) MSC, 9 (1938) MSC, 1274 (1940) MSC, 3330 (1943) CIS. Keweenaw CO. F. E. Wood 3066 (1884) MSC; O. A. Farwell (1866) MSC 21395, 467 (1866) MSC. LENAWEE CO. W. J. Beal (1866) MSC 21398. LIVINGSTON CO. D. M. Lynch (1947) MSC. MARQUETTE CO. A. Dachnowski (1906) UM; M. T. Bingham (1942) CIS 8996. MEMPHIS CO. C. O. Grassl 5, 3147 (1933) UM, 5, 3147 (1933) UM. MISSAUKEE CO. H. T. Darlington 576 (1916) MSC. MUSKIEGO CO. C. D. McLouth (1898) MSC 21399. OAKLAND CO. C. Billington WMC, (1920) UM; M. T. Bingham (1934) CIS 1523, (1936) CIS 1521, (1936) CIS 1522. OTSEGO CO. H. A. Tanner 34 (1950) MSC. FRESQUE ISLE CO. J. H. Enlers 5442 (1933) UM; F. Boynton (1947) GWP. SCHOOLCRAFT CO. J. H. Enlers 4259 (1929) UM. ST. CLAIR CO. C. K. Dodge (1892) UM; C. A. Farwell 6407 (1922) UM. VAN BUREN CO. C. H. Kauffman (1910) UM. WASHTENAW CO. D. Houghton (1838) UM; E. C. Almen-dinger UM; A. J. Pieters (1893) UM; B. A. Walpole (1919) MSC 21390; F. G. Gustafson (1922) UM; E. W. Erlanson & S. H. Emerson 5357 (1927) UM; 5357 (1927) MSC; C. C. Grassl *7751 (1937) UM; S. A. Cain & D. Hagenan (1948) CIS 12958.

WAYNE CO. O. A. Farwell (1901) UM; C. Billington (1916) CIS 1325.

Unconfirmed Reports: PERRIEN CO. F. E. Nebert (125). CHARITY ISLANDS C. K. Dodge (81). CHEBOYGAN CO. D. Dean & H. Coburn (87); D. Sigler & M. Woollett (133); E. Woollett (164). CHAFFETON CO. C. K. Dodge (87). DICKINSON CO. C. A. Davis (78). HURON CO. C. A. Davis (80), (83). ISLE ROYALE C. A. Brown (82); W. S. Cooper (61). KALAMAZOO CO. C. R. & F. N. Hanes (124). KEMSEENAW CO. S. M. Coulter (62). MAVISTEE CO. F. P. Daniels (63). MARQUETTE CO. C. K. Dodge (83). ONTONAGON CO. A. G. Ruthven (131). SCHUCLCRAFT CO. C. K. Dodge (86); R. W. Hunt (143). ST. JOSEPH CO. F. P. Daniels (66). TJISCOLA CO. C. K. Dodge (88). WABATENAW CO. L. H. Weld (157).

Map 13.

3. ELEOCHARIS R. Br. Frou. 1:209. 1810.

Eleocharis is another genus which, like Cyperus, has a world-wide range and a center of distribution in the tropics and sub-tropics. Some 150 species are recognized at the present; 19 of which are known to occur in Michigan.

Key To The Michigan Species

- A. Spikelets about as thick as the culms.
 - B. Spikelets with numerous, keel-less, coriaceous scales.
 - C. Culms round, septate.
 - 1. E. equisetoides.
 - C. Culms quadrangular, not septate.
 - 2. E. quadrangulata.
 - B. Spikelets with few, keeled, membranous scales.
 - 3. E. Robbinsii.
- A. Spikelets much thicker than the culms.
 - D. Styles 2-parted; achenes lenticular or biconvex.
 - E. Sheaths loose, scarious, hyaline at their summits; achenes olive to dark brown; tubercle greenish.
 - 4. E. olivacea.
 - E. Sheaths close, firm, herbaceous to herbaceous at their summits.
 - F. Plants with fibrous roots (or with slender, thread-like rhizomes in no. 6.).
 - G. Sheaths oblique at the summits, with elongate-deltoid tooth; achenes black or greenish; tubercle depressed or awl-shaped.
 - H. Achenes shiny black to purple; tubercle white, depressed.
 - 5. E. geniculata.
 - H. Achenes greenish to olivaceous; tubercle awl-shaped with flange-like base.

6. E. intermedia.
- G. Sheaths subtruncate at the summit, short, broad-deltoid tooth; achenes whitish, yellowish to brown; tubercle deltoid to turban shaped, brown.
- I. Tubercle at base as broad, or almost as broad as the top of the achene.
- J. Tubercle low, less than one-fourth the height of the achene, broad and sessile; bristles barely reaching base of tubercle, shorter or wanting.
7. E. Enaermannii.
- J. Tubercle deltoid, one-third to one-half the height of the achene.
8. E. obtusa.
- I. Tubercle at base about two-thirds as broad as the top of the achene.
9. E. ovata.
- F. Plants with firm, well-developed rhizomes or stolons.
- K. Basal scale of spikelet solitary, spatheform, completely encircling the base of the spikelet.
10. E. calva.
- K. Basal scales of spikelet usually 2 or 3 below the thinner fertile scales, the lowest not encircling the base of the spikelet.
11. E. Smallii.
- D. Styles 3-parted; achenes triangular in cross-section.
- L. Tubercle appearing as if a continuation of the summit of the achene, differing in texture from the achene.
- M. Culms less than 1 mm. thick, soft, capillary, upright; stolons tuber-tipped; scales thin.
- N. Culms less than 1 dm. high; spikelets 2--4 mm. long; scales green or light brown, 1.5--2.5 mm. long; achenes 0.9--1.5 mm. long.
12. E. parvula.
- N. Culms up to 4 dm. high; spikelets 4--7 mm. long; scales purplish or brownish, 3--8 mm. long; achenes 1.8--2.5 mm. long.
13. E. pauciflora
var. fernaldii.
- M. Culms 1--2 mm. broad, firm, flattened, often bending over and rooting at the tip; lacking stolons or tubers; scales coriaceous.

14. E. rostellata.
- L. Tubercle conspicuously differentiated from the achene.
- O. Achenes with prominent longitudinal ridges separated by numerous slender trabeclae, whitish or pearly in color, obscurely 3-angled.
15. E. acicularis.
- O. Achenes smooth or reticulate to deeply roughened, without either longitudinal ridges or trabeclae; achenes not white nor pearly.
- P. Achenes smooth or finely reticulated in lines, black or green in color.
- Q. Achenes smooth, black; broad, pale tubercle completely covering summit of the achene.
16. E. melanocarpa.
- Q. Achenes delicately reticulated in lines, greenish to olivaceous; tubercle awl-shaped with flange-like base.
6. E. intermedia.
- P. Achenes reticulate to deeply roughened, yellow, golden to brown in color.
- R. Achenes with prominent keel-like angles; spikelets cylindric.
17. E. tricostata.
- R. Achenes without keel-like angles; spikelets ovoid to ellipsoid.
- S. Culms flattened, scales of spikelets (except sometimes in var. atrata) with conspicuously whitened, often bifid, acuminate tips; achenes obovoid--pyriform with rather shallow irregular reticulation, style base conical.
- T. Scales chestnut brown.
18. E. compressa.
- T. Scales conspicuously blackened; culms tending to be narrower.
- 18a. E. compressa var. atrata.
- S. Culms 4 or 5-angled, narrower; scales reddish-brown to black, scale tips acute or obtuse, not conspicuously whitened; achenes obovoid with prominent surface markings, often with wavy transverse bands; style base flattened.
19. E. elliptica.

1. Eleocharis equisetoides (Ell.) Torr. Ann. Lyc. N.Y. 3: 296. 1836.
Scirpus equisetoides Ell. Sk. S. Car. 1:79. 1816.
Eleocharis interstincta of many American authors, in part, not of (Vahl) R. & S.
Trichophyllum interstinctum (Vahl) Farwell, Mich. Acad. Sci., Ann. Rep. 21:383. 1919.

Knotted Spike-Rush. A plant of shallow waters of lake shores and ponds in the southern counties of Michigan.

Specimens Examined: CASS CO. F. C. Gates 1328 (1906) JM.
JACKSON CO. G. H. Hicks (1893) MSC 21573. KALAMAZOO CO. L. A. Kenoyer (1933) WLC. LIVINGSTON CO. J. H. Ehlers 2775 (1923) UM.
VAN BUREN CO. H. S. Pepoon 103 (1903) MSC. WASHINGTON CO. F. K. Sparrow 2754 (1939) CIS. COUNTY UNKNOWN Anon. JM.

Unconfirmed Reports: JACKSON CO. J. Wright (165).
KALAMAZOO CO. C. R. & F. N. Hanes (124). OAKLAND CO. C. Billington (49).

Map 14.

2. Eleocharis quadrangulata (Michx.) R. & S. var. crassior Fern. Rhodora 37:333. 1935.
Scirpus quadrangulatus Michx. Fl. Bor. Am. 1:50. 1933.
Eleocharis mutata of Britton & Brown Ill. Fl. ed. 2, 1:311. 1913, not of (L.) R. & S.
Trichophyllum mutatum (L.) Farwell, Mich. Acad. Sci. Ann. Rep., 21:383. 1919.

Angled Spike-Rush. Found usually in shallow water.

Specimens Examined: CHEBOYGAN CO. F. K. Sparrow (1943) UM.
INGHAM CO. L. H. Bailey (1886) MSC 21747; C. F. Wheeler (1892) MSC 21305; L. J. Cole (1895) MSC 21306; H. C. Skeels (1893) MSC 21476; C. K. Dodge (1903) UM; C. Billington (1924) WLC, (1924) CIS 1556, (1924) UM. JACKSON CO. G. H. Hicks (1893) MSC 21472. KENT CO. E. J. Cole (1897) MSC 21473. MONTCALM CO. C. F. Wheeler (1889) CIS 14119. OAKLAND CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11333. PRESQUE ISLE CO. F. Boynton (1947) GWP. ST. CLAIR CO. W. S. Cooper (1901) MSC 21581; C. K. Dodge 905 (1903) MSC.

Unconfirmed Reports: CLINTON CO. C. F. Wheeler (158), GRATIOT CO. W. J. Beal (46). KALAMAZOO CO. C. R. & F. N. Hanes (124).

Map 15.

3. Eleocharis Robbinsii Oakes Hovey's Mag. Hort. 7:173. 1841.
Trichophyllum Robbinsii (Oakes) Farwell, Mich. Acad. Sci., Ann. Rep., 21: 383. 1919.

Robbin's Spike-Rush. In shallow water at the borders of ponds and lakes, or on exposed lake bottoms.

Specimens Examined: ALGER CO. M. L. Fernald & . .
 Pease 3148 (1904) UM. CLINTON CO. C. F. Wheeler (1890) CIS
 14130. INGHAM CO. C. F. Wheeler (1893) MSC 21477. FREQUENT ISLE CO.
 J. H. Ehlers 6157 (1906) UM; N. Katz (1939) CIS 10249;
 R. McVaugh 9789 (1943) UM, 9789 (1943) CIS.

Unconfirmed Reports: KALAMAZOO CO. C. W. Bazuin (44);
 C. R. & F. W. Hanes (124).

Map 16.

4. Eleocharis olivacea Torr. Ann. Lyc. N. Y. 3:300. 1836.
Trichosphyllum olivaceum (Torr.) Farwell, Mich. Acad.
 Sci., Ann. Rep., 21:358. 1919.

Found along muddy borders of lakes, sandy shores, often
 in shallow water and on bog mats.

Specimens Examined: CHAS CO. H. S. Pepon 777 (1906) MSC,
 (1906) UM. CHEBOYGAN CO. J. H. Ehlers 8909 (1905) UM.
HOUGHTON CO. C. A. Davis (1900) UM. INGHAM CO. C. F. Wheeler
 (1890) CIS 14130, (1893) UM; C. F. Wheeler & G. H. Hicks
 (1893) MSC 21406, (1893) MSC 21414. JACKSON CO. F. J. Hermann
 9300 (1937) UM. KALAMAZOO CO. L. A. Kenoyer (1930) MSC. KENT CO.
 E. J. Cole (1898) MSC 21406, (1898) UM, (1899) UM; C. W.
 Bazuin 690 (1939) MSC, 1800 (1940) MSC, 1810 (1940) CIS.
LIVINGSTON CO. J. H. Ehlers 5361 1903 UM. MONTCALM CO.
 C. A. Davis (1895) UM, (1900) UM, (1900) UM. MUSKEGON CO.
 C. W. Bazuin 6748 (1945) MSC, 6732 (1945) CIS, 6723 (1945)
 MSC. NEWAYGO CO. C. W. Bazuin 6453 (1945) MSC. OTIWA CO.
 C. W. Bazuin 1356 (1940) MSC. FREQUENT ISLE CO. F. Boynton
 (1947) GUP. WASHTENAW CO. L. Wenmeyers & A. H. Smith (1900)
 UM; F. J. Hermann 6997 (1939) UM; C. O. Grassl * 7741 (1937) UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates (112);
 L. Goe (119). CLINTON CO. C. F. Wheeler (188). EMMET CO.
 H. A. Gleason (118). HORON CO. C. A. Davis (74); C. A. Dodge
 (20). KALAMAZOO CO. C. R. & F. W. Hanes (124).

Map 17.

5. Eleocharis geniculata (L.) R. & S. Syst. Veg. 2:150.
 1817; not of recent American authors.
Eleocharis capitata (L.) R. Br. Prodr. Fl. Nov. Holl.
 1:325. 1810.
Eleocharis dispar E. J. Hill, Bot. Gaz. 7:3. 1882.
Eleocharis capitata var. dispar Fernald, Rhodora
 8:129. 1906.
Eleocharis caribaea (Rottb.) Blake var. dispar
 (E. J. Hill) Blake, Rhodora 20:24. 1913.

Found on wet, sandy edges of ponds. Collected in Michigan
 only by F. J. Hermann (126). The history of the synonymy of
 this species is told in some detail by Svenson (40) and serves
 well to illustrate how confusing the problem of correct nomen-
 clature can become.

Specimens Examined: JACKSON CO., Portage Lake, F. J. Hermann 9299 (1937) JM. WASHTENAW CO. Silver Lake, F. J. Hermann 620 (1934) JM.; West Lake, 6996 (1935) JM.; Silver Lake, 6457 (1935) JM.; Silver Lake, 6957 (1935) MSC.

Unconfirmed Reports: SOUTHERN MICHIGAN J. Wright (1935).

Map 18.

6. Eleocharis intermedia (Muhl.) Schultes, Mant. 2:91. 1821.
Trichosphyllum intermedium (Muhl.) Farwell, Mich. Acad. Sci., Ann. Rep. 21:359. 1919.

A plant of moist soil, along streams, edges of ponds, lake shores and marshes.

Specimens Examined: ALGER CO. C. F. Wheeler (1900) MSC 21566, 185 (1900) MSC. CHEBOYGAN CO. H. A. Tanner 46 (1930) MSC. ELMHURST CO. T. A. F. Marshall 795 (1949) MSC. GRATIOT CO. C. A. Davis (1830) MSC 21577, (1833) CIS 10381, (1895) JM., (1898) JM. INGHAM CO. C. F. Wheeler (1891) MSC 21570, (1891) CIS 14131. JACKSON CO. Anon. (1833) JM.; Anon. JM. ALLEN CO. C. W. Fallass (1897) MSC 21565; E. J. Cole (1899) MSC 21516, (1899) JM.; C. W. Hazuin 1732 (1940) MSC, 1732 (1940) MSC, 1835 (1940) MSC, 1835 (1940) CIS, 2233 (1940) CIS, 4240 (1940) CIS, 1732 (1940) CIS. KALAMAZOO CO. L. A. Kenoyer (1930?) WMC. MUSKEGON CO. D. D. Cooley (1849) MSC 21573. MECOSTA CO. H. T. Darlington 982 (1916) MSC. MORRIS CO. M. McDonald 5649 (1949) MSC. MUSKEGON CO. C. D. McLouth (1899) MSC 21574. OTTAWA CO. C. H. Kaufman (1910) JM. ROSCOMMON CO. C. Billington (1919) CIS 1335, (1919) WMC. WASHTENAW CO. C. O. Grassi 7353 (1935) JM.

Unconfirmed Reports: ALGER CO. C. F. Wheeler (160). BERRIEN CO. P. E. Nebert (125). CLINTON CO. W. J. Beal (46). GRAND TRAVERSE CO. W. H. Winchell (162). KALAMAZOO CO. C. R. & F. W. Hanes (124). MANISTEE CO. F. P. Daniels (65). ST. JOSEPH CO. F. P. Daniels (66).

Map 19.

7. Eleocharis Engelmanni Steud. forma detonsa (Gray) Svenson, Anodora 31: 208--209. 1929.
Eleocharis Engelmanni Steud. var. detonsa Gray, Patterson, Cat. Fl. Illinois, 46. 1876.
Eleocharis Engelmanni Steud. Syn. Pl. Cyp. 79. 1855.
Trichosphyllum Engelmanni (Steud.) Farwell, Mich. Acad. Sci. Ann. Rep., 21: 359. 1919.

Engelmann's Spike-rush. Usually found in wet, muddy places, marshes, sometimes in sandy soil. The species is represented in Michigan by the form detonsa with no bristles or only, mere rudiments of them.

Specimens Examined: KALAMAZOO CO. L. A. Kenoyer (1930) MSC. JACKSON CO. S. A. & D. R. Camp (1893) MSC 21564, (1893) MSC 21565, (1893) UM. MORRIS CO. M. McDonald 5505 (1949) MSC.

Unconfirmed Reports: KALAMAZOO CO. C. A. & F. A. Nanes (124). KENT CO. E. J. Cole (38). WAYNE CO. W. J. Beal (46).
Map 20.

8. Eleocharis obtusa (Willd.) Schultes, Lant. 2: 89. 1824.

Eleocharis ovata of many American authors, not of
R. & S. 1817.

Trichophyllum obtusum (Willd.) Farwell, Mich. Acad.
Sci., Ann. Rep., 21: 308. 1919.

Blunt Spike-rush. Found in a variety of suitable habitats, damp muddy places along shores, streams, logs and ditches, and in wet meadows.

Specimens Examined: ALCOA CO. H. T. Darlington B&D 2284 (1918) MSC, 2306 (1918) MSC. AMERAS CO. C. F. Wheeler 332 (1900) MSC, 344 (1900) MSC. BAR CO. G. M. Bradford (1901) MSC. BERRIEN CO. H. T. Darlington 1835 (1917) MSC. CASS CO. H. S. Pepson 194 (1904) MSC, 330 (1903) MSC; F. C. Gates (1906) UM. CHEBOYGAN CO. E. L. Miner (1901) UM; J. A. Enlers 7049 (1936) UM. CHITTENAW CO. F. J. Hermann 7030 (1935) UM. ELMER CO. E. L. Smits (1926) MSC. GOGHEIC CO. H. T. Darlington B&D 3022 (1919) MSC, B&D 3022 (1919) UM. GRAND ICT CO. C. A. Davis (1893) CIS 10549, (1893) UM, (1893) UM. Houghton CO. C. K. Dodge (1916) UM; F. J. Hermann 1568 (1927) UM. MUSKOGEE CO. C. K. Dodge (1892) UM. INGHAM CO. Anon. (1887) MSC 21582; M. Craig (1905) MSC. IRON CO. C. O. Grassl 6, 7332 (1934) CIS 16529. JACKSON CO. G. A. Hicks (1893) MSC 21432. KALAMAZOO CO. C. R. Nanes (1935) UM; V. Janson 22 (1930) MSC. KENT CO. C. W. Bazuin (1939) CIS 12003, 707 (1939) MSC, 377 (1939) MSC, 640 (1939) MSC, 677 (1939) MSC, 1512 (1940) MSC, 1662 (1940) MSC, 1693 (1940) MSC, 1643 (1940) MSC, 1644 (1940) MSC, 2096 (1940) MSC, 2138 (1940) CIS, 6132 (1940) CIS, 2143 (1940) CIS. KEWEENAW CO. O. A. Farwell (1828) MSC 21429, 347 (1827) MSC. LINCOLN CO. W. J. Beal (1866) MSC 21427 (1867) MSC 21583; Mrs. J. T. Boyce 88 (1905) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACOMB CO. D. D. Cooley (1837) MSC 21543, MSC 21544; A. J. Pieters (1893) UM, (1893) UM, (1893) UM, (1893) UM 57 (1893) MSC. MARQUETTE CO. C. F. Wheeler (1892) MSC 21424; A. Dachnowski (1906) UM; C. K. Dodge (1916) UM; M. T. Pingnam (1944) CIS 2398. MORRIS CO. M. McDonald 5583 (1949) MSC, 5584 (1949) MSC, 5595 (1949) MSC. MONTCALM CO. C. F. Wheeler 339 (1900) MSC; E. Barlow (1900) MSC 21508. MUSKOGEE CO. C. D. McLouth (1893) MSC 21426; C. W. Bazuin 3211 (1941) CIS. OSHTON CO. O. A. Farwell 4320 (1916) UM, 4320 (1916) UM, 5165 (1916) UM, (1916) UM; C. Billington (1916) MSC;

M. T. Bingham (1930) CIS 1040, (1930) CIS 1039. ONTONAGON CO.
 L. R. Dice (1920) UM, (1920) UM. OTTAWA CO. C. H. Kauffman
 (1910) UM; C. W. Bazuin 5133 CIS, 1043 (1946) CIS, 1015
 (1940) MSC, 1030 (1940) MSC, 1067 (1940) MSC. FREQUITE ISLE CO.
 J. H. Emlers 0248 (1937) UM. ST. CLAIR CO. C. K. Dodge (1892)
 UM, (1892) CIS 1037, (1892) UM, (1892) UM, (1901) UM, 190
 (1909) MSC. TUSCULA CO. C. A. Davis (1898) UM. VAN BUREN CO.
 H. S. Pepon 621 (1905) MSC. WASHTENAW CO. N. H. Winchell
 (1862) UM; E. A. Walpole (1918) UM; F. G. Gustafson (1922) UM;
 E. W. Erianson & S. H. Emerson 5365 (1927) UM, 5365 (1927) MSC;
 F. J. Hermann 8507 (1936) UM; C. O. Grassl 8, 7742 (1937) CIS,
 8, 7742 (1937) UM, 8, 7742 (1937) UM. WAYNE CO. O. A. Farwell
 (1892) CIS 9666, 1640 (1892) UM, C. Billington (1915) CIS
 1536; J. M. Sutton 132 (1916) UM; C. O. Grassl 5, 4562 (1932)
 UM, 5, 4562 (1937) UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates (116).
KENT CO. E. J. Cole (58). WAYNE CO. D. H. Campbell (56).

Map 21.

9. Eleocharis ovata (Roth) R. & S. Syst. 2: 132. 1817.
Trichophyllum ovatum (Roth) Farwell, Mich. Acad.
 Sci., Ann. Rep., 31: 353. 1919.

This northern species has essentially the same habitats
 as E. obtusa. Known only from a few collections in the Upper
 Peninsula. Earlier collectors included under E. ovata
 their collections of E. obtusa, so the unconfirmed reports
 for E. ovata must be considered with a grain of salt, parti-
 cularly if they refer to southern Michigan counties.

Specimens Examined: IRON CO. C. O. Grassl 6, 7832 (1934)
 UM, 6, 7832 (1934) UM. KEWEEAW CO. F. J. Hermann 8275 (1936)
 UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates (110);
 F. C. Gates & J. H. Emlers (113). HURON CO. C. A. Davis (74).
KEWEEAW CO. O. A. Farwell (96). MANISTEE CO. F. P. Daniels
 (65). MARQUETTE CO. A. Dachnowski (65). CARLAND CO. M. T.
 Bingham (51). ST. CLAIR CO. C. K. Dodge (79). ST. JOSEPH CO.
 F. P. Daniels (66). TUSCULA CO. C. A. Davis (77).

Map 22.

10. Eleocharis calva Torr. Fl. N. Y. 2: 346. 1843.
Eleocharis palustris var. calva (Torr.) Gray, Man.
 522. 1843.
Eleocharis palustris var. glaucescens of many
 American authors; not A. Gray 1867.
Trichophyllum palustre var. calvum (Torr.) Farwell,
 Mich. Acad. Sci., Ann. Rep., 31: 358. 1920.
Trichophyllum palustre var. glaucescens (Willd.)
 Farwell, l. c.

Spatniform Spike-Rush. Found along wet shores, river banks, bogs, and low, wet or springy spots.

Specimens Examined: ALPENA CO. C. F. Wheeler (1898) MSC 21448. ANTRIM CO. H. A. Tanner 69 (1930) MSC. BARRY CO. S. B. Hedges 2 (1930) MSC. ELLY CO. R. R. Dreisbach 5049 (1927) CIS, 5049a (1927) CIS. FERRIEN CO. G. L. Ames (1869) UM. BOISELANT ISLAND M. T. Bingham (1939) CIS 1542. CHEBOYGAN CO. J. H. Eilers 6136 (1936) UM; S. A. Cain & F. Segadas Vianna (1948) CIS 11332. CLARE CO. H. T. Darlington 753 (1912) MSC; C. A. Kauffman & B. B. Kanouse (1926) UM. CLINTON CO. D. M. Brooks 36a (1930) MSC. GRATIOT CO. C. A. Davis (1898) UM. Houghton CO. F. J. Hermann 1538 (1927) UM. HURON CO. C. A. Davis (1890) UM, (1890) UM; C. K. Dodge (1909) UM. INGHAM CO. Anon. (1887) MSC 21443; Anon. (1887) MSC 21447; Anon. (1887) MSC 21437; T. H. F. Marshall 968 (1949) MSC. KALAMAZOO CO. F. W. Rapp 3954 (1940) CIS. KENT CO. C. W. Bazuin 14 (1938) MSC, 33 (1938) MSC, 612 (1939) MSC, 1632 (1940) CIS 2378 (1941) CIS, 1508 (1940) MSC, 1234 (1940) MSC, 1753 (1940) MSC, 1746 (1940) MSC, 1799 (1940) MSC, 2184 (1940) MSC, 1743 (1940) MSC, 1902 (1940) MSC, 1247 (1940) MSC, 1652 (1940) MSC, 1370 (1940) MSC, 1632 (1940) MSC. Keweenaw CO. O. A. Farwell 548 (1887) MSC, 772 (1890) UM; F. J. Hermann 3238 (1936) UM. LENAWEE CO. Mrs. J. T. Boyce 48 (1905) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. LUCE CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11328. MACQUINAC CO. C. K. Dodge (1912) UM; S. A. Cain & F. Segadas Vianna (1948) CIS. MACQUINAC ISLAND C. K. Dodge (1912) UM. MACOMB CO. D. B. Cooley (1847) MSC 21436; A. J. Pieters (1895) UM, (1895) UM. MARQUETTE CO. A. Dacnowski (1906) UM; C. K. Dodge (1916) UM. MECOSTA CO. R. R. Dreisbach 5233 (1927) CIS. MENOMINEE CO. C. C. Grassl 2, 2780 (1933) UM, * 7851 (1935) UM. MONROE CO. O. A. Farwell 5477 (1920) UM; M. McDonald 5005 (1947) MSC. MONTCALM CO. C. F. Wheeler 330 (1900) MSC. MUSKEGON CO. W. J. Beal (1898) MSC 21500. NEWAYGO CO. C. W. Bazuin 3550 (1941) CIS. OKLAND CO. O. A. Farwell 4270 (1916) UM; C. Billington (1916) UM, (1916) MSC, (1919) CIS 1532, (1924) CIS 1551, (1924) CIS 1550; M. T. Bingham (1935) CIS 1546, (1935) CIS 1544, (1935) CIS 1563, (1935) CIS 1562; S. A. Cain & F. Segadas Vianna (1948) CIS 11335, (1948) 11339. OCEANA CO. C. W. Bazuin 4736 (1942) CIS. OTTAWA CO. C. W. Bazuin 1331 (1940) MSC, 1465 (1940) MSC, 1331 (1940) MSC. PRESQUE ISLE CO. J. H. Eilers 3681 (1934) UM; N. W. Katz (1939) CIS 10250; F. Boynton (1947) GWP, (1947) GWP. SAGINAW CO. H. T. Darlington 228 (1916) MSC. ST. CLAIR CO. C. K. Dodge (1892) UM, (1894) UM, 964 (1896) MSC, (1896) MSC 21446, (1911) UM, (1917) UM. SCHOOLCRAFT CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11329. VAN BUREN CO. L. H. Fennington (1910) UM. WADSWORTH CO. A. J. Pieters (1894) UM; C. A. Kauffman (1926) UM; C. A. Kauffman & B. B. Kanouse (1926) UM, (1926) UM, (1926) UM;

C. A. Farwell 8436 (1929) UM; F. G. Gustafson (1923) UM;
C. O. Grassl 3, 7255 (1936) UM. LAYNE CO. C. A. Farwell
675a (1895) UM, 1970c (1906) UM, 1976a (1906) UM, 1894g
(1906) UM; C. Billington (1915) CIS 1552; J. M. Sutton
185 (1916) UM.

Unconfirmed Reports: ISLE ROYALE CO. A. Brown (32);
W. S. Cooper (61); W. F. Holt (138). KALAMAZOO CO. C. R. &
F. W. Hanes (124). KENT CO. E. J. Cole (33). MENOMINEE CO.
E. J. Hill (135). TUSCOLA CO. C. K. Dodge (33). WASHTENAW CO.
C. R. Hanes (120); E. W. Transeau (135).

Map 23

11. Eleocharis Smallii Britt. Torrey 3: 23. 1903.
Scirpus palustris L. Sp. Pl. 1: 47. 1753.
Eleocharis palustris of most Michigan authors,
not of (L.) R. & S. 1817.
Eleocharis palustris var. major, of Michigan
authors, not of Sonder, 1851.
Eleocharis palustris, var. vicens, of Michigan
authors, not of L. H. Bailey, 1889.
Trichophyllum palustre (L.) Farwell, Mich.
Acad. Sci. Ann. Rep., 13: 166. 1913.
Trichophyllum palustre var. vicens (Bailey)
Farwell, Mich. Acad. Sci., Ann. Rep., 21: 353. 1920.

Grows in marshy ground, bogs, along streams, ponds and
lakes, often in shallow water. This species is part of the
"palustris-complex" which has been the subject of discussion,
recently, of Fernald and Brackett (24) and Svenson (41). The
writer has chosen to follow Svenson in calling all Michigan
material Eleocharis Smallii which is the American counter-
part of the European E. palustris.

Specimens Examined: ALCONA CO. W. J. Beal & C. F. Wheeler
(1893) MSC 21432. ALGER CO. C. K. Dodge (1916) CIS 1554;
S. A. Cain & F. Segadas Vianna (1936) CIS 11337. ALPENA CO.
H. T. Darlington B&D 1987 (1913) MSC. BEAVER ISLAND CO. C. F.
Wheeler 209 (1900) MSC. BOIS BLANC ISLAND S. A. & D. R. Camp
(1894) MSC 21513, (1894) MSC 93992; W. T. Bingham (1909)
CIS 1549. BERRIEN CO. BERRIEN CO. C. K. Dodge & H. T. Darling-
ton 1574 (1917) MSC. CASS CO. C. F. Wheeler (1890) MSC 93995.
CHEBOYGAN CO. C. F. Wheeler (1890) MSC 21443; F. C. Gates 256
(1911) MSC; J. H. Enlers 1003 (1920) MSC, 1003 (1920) UM,
1610 (1921) UM, 2075 (1922) UM, 5405 (1933) UM, 5351 (1933)
UM, 5415 (1933) UM, 6240 (1937) UM; W. Katz (1939) CIS 10267;
S. A. Cain & F. Segadas Vianna (1948) CIS 11343, (1948) CIS
11342. CHIFFEWA CO. C. K. Dodge (1914) UM, (1914) UM; F. J.
Hermann 7237 (1925) MSC. CLINTON CO. C. F. Wheeler (1891)
MSC 21451; H. C. Skeels (1895) MSC 21546; D. M. Brooks 36

(1950) MSC. GOGEBIC CO. E. A. Bessey B&D 2543 (1917) MSC; H. T. Darlington 2803 (1919) UM. GRAND TRAVERSE CO. W. J. Beal & C. F. Wheeler (1898) MSC 21452. HOUGHTON CO. F. J. Hermann 8103 (1906) UM; P. F. Hypio 177 (1930) MSC. INGHAM CO. H. C. Skeels (1895) MSC 93931. ISLE ROYALE University Party (1868) UM; C. A. Brown 3366 (1930) UM, 3470 (1930) UM. JACKSON CO. S. A. & D. R. Camp (1893) UM, (1893) MSC 21450. KALAMAZOO CO. F. W. Rapp 5346 (1940) UM. KEAT CO. E. J. Cole (1894) MSC 93989; C. F. Wheeler & E. J. Cole, et al. (1897) MSC 21434; C. W. Bazuin 1531 (1940) MSC, 1530 (1940) MSC, 1533 (1940) MSC, 1699 (1940) MSC, 1303 (1940) MSC, 1305 (1940) MSC, 1764 (1940) MSC, 1661 (1940) MSC, 1870 (1940) LSC, 1729 (1940) MSC, 1700 (1940) MSC, 1730 (1940) MSC, 1807 (1940) MSC, 1544 (1940) MSC, 1532 (1940) MSC, 2290 (1940) CIS, 1532 (1940) CIS, 1504 (1940) CIS. KEWENAUA CO. O. A. Farwell (1836) MSC 21545, 675 (1838) MSC, 773 (1890) UM, 773 (1890) MSC, 841½ (1894) UM. LAKE CO. C. W. Bazuin 6839 (1946) MSC. LJCE CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11336, (1948) CIS 11340, (1948) CIS 11341. LACKINAW CO. J. A. Enlers 2763 (1923) UM, 3470 (1933) UM. LACOMB CO. D. D. Cooley (1842) MSC 93998; A. J. Pieters (1893) UM. MARQUETTE CO. C. F. Wheeler (1890) MSC 21441; A. Dacanowski (1906) UM, (1906) UM; C. K. Dodge (1916) UM; M. T. Dingham (1940) CIS 8999. MCKINAC CO. M. McDonald 5086 (1949) MSC, 5779 (1950) MSC. MONTCALM CO. C. F. Wheeler 321 (1900) MSC. MUSKEGON CO. R. R. Dreistach 5241 (1927) CIS. MUSKEGON CO. C. W. Bazuin 3192 (1941) CIS. OAKLAND CO. M. T. Dingham (1935) CIS 1543, (1936) CIS 1547, CIS 1545; S. A. Cain & F. Segadas Vianna (1933) CIS 11334, (1943) CIS 11333. ONTONAGON CO. H. T. Darlington (1922) MSC 21443. OTSEGO CO. R. McVaugh 9677 (1943) UM. PRESQUE ISLE CO. F. Boynton (1947) GWP. ST. CLAIR CO. C. K. Dodge (1892) UM, (1895) MSC 21435, (1895) MSC 21509, (1909) UM. SCHOOLCRAFT CO. C. A. Davis (1905) UM; J. A. Enlers 4291 (1929) UM. WASHTENAW CO. Anon. (1833) UM; Anon. (1833) UM; F. G. Williamson (1901) UM; C. O. Grassl 2, 7850 (1936) UM; F. J. Hermann 6258 UM. WAYNE CO. C. F. Wheeler (1893) MSC 21458; M. McDonald 5730 (1950) MSC, 5698 (1950) MSC, 5699 (1950) MSC.

Unconfirmed Reports: BAY CO. W. J. Beal (46). CHARITY ISLANDS C. K. Dodge (81). CHEBOYGAN CO. E. Woollett (163), (164). HURON CO. C. K. Dodge (80). ISLE ROYALE C. C. Adams (43); W. P. Holt (138); W. S. Cooper (61). KALAMAZOO CO. C. R. & F. M. Hanes (124). LANISTEE CO. F. P. Daniels (65). ST. JOSEPH CO. F. P. Daniels (86). SCHOOLCRAFT CO. C. K. Dodge (86). TULCCLA CO. C. K. Dodge (88). WASHTENAW CO. L. H. Weld (157); B. A. Walpole (156). WAYNE CO. O. A. Farwell (106); J. M. Sutton (154). SOUTHERN MICHIGAN J. Wright (165). SOUTHWESTERN MICHIGAN H. S. Pepoon (147).

12. Eleocharis parvula (R. & S.) Link, ex Bluff, Nees & Schauer in Bluff & Fingerhuth, Comp. Fl. Germ. ed. 2. 1. part 1; 93. 1836.
Scirpus nanus, in part, of some authors, not of Spreng. 1813.
Eleocharis pyramidea, in part, of some authors, not of Torr. 1836.

Dwarf Spike-Rush. Said to be a plant of salt marshes and brackish mud or sand along seacoasts. The Wheeler specimen is reported to be found in a "salt-lick" near Hubbardston and the Smith specimen from "brackish banks" of the Maple River, near Hubbardston, both habitats which duplicate coastal conditions.

Specimens Examined: CLINTON CO. C. F. Wheeler (1887) MSC 21405; E. F. Smith (1878) JM.

Unconfirmed Reports: GRATIOT CO. C. F. Wheeler (161). CALLAND CO. M. T. Bingham (81). ST. CLAIR CO. C. K. Dodge (79). Map 25.

13. Eleocharis pauciflora (Lignit.) Link, var. Feinaldii Svenson, Rhodora 36; 330. 1934.
Scirpus pauciflora, of many American authors, not of Lignit. 1777.
Eleocharis pauciflora of most Michigan authors, not of Link 1827.

Few-flowered Spike-Rush. Wet soil of bogs, shores and stream banks.

Specimens Examined: ALCONA CO. H. T. Darlington E&D 2131 (1918) MSC, 2191 (1918) MSC. ALPENA CO. C. F. Wheeler (1898) MSC 21468; C. K. Dodge (1912) JM. BEAVER ISLAND M. C. Ries 977 (1931) CIS. BOIS BLANC ISLAND S. H. & D. R. Camp (1894) MSC 18459; M. T. Bingham (1936) CIS 1838. CHARLEVOIX CO. C. F. Wheeler (1892) MSC 21466, (1892) UM; R. McVaugh 10848 (1949) UM. CHEBOYGAN CO. J. H. Enlers 1637 (1921) UM, 3271 (1925) UM, 5306 (1933) UM, 6132 (1936) UM, 7081 (1938) UM; B. L. Smits (1926) MSC. CHIPPewa CO. F. J. Hermann 7140 (1938) MSC, 7255 (1938) UM. DEBIA CO. C. O. Grassl * 7321 (1934) UM. ELEET CO. C. A. Fallas (1896) MSC 21461, (1897) MSC 21471; J. H. Enlers 2535 (1923) UM, 2635 (1925) UM, 2655 (1925) UM; R. McVaugh 10795 (1949) UM, 10795 (1949) CIS; T. A. P. Marshall 506 (1949) MSC. GRAND TRAVERSE BAY (Bassett's Island) C. F. Wheeler (1896) MSC 21464. GRAND TRAVERSE CO. R. R. Dreisbach 5301 (1927) CIS. Houghton CO. C. A. Davis (1908) JM. Huron CO. C. A. Davis (1896) MSC 21465; C. K. Dodge (1904) UM, (1905) JM. JACKSON CO. F. J. Hermann

9306 (1937) UM. MACKINAC CO. J. A. Ehlers 1837 (1921) UM, 5487 (1933) UM; R. McVaugh 11090 (1949) CIS, 11090 (1949) UM. MANISTEE CO. F. P. Daniels (1900) MSC 18483. MANOMINEE CO. C. C. Grassl 2, 2780 (1933) UM. ALBANY CO. C. W. Bazuin 3838 (1941) MSC, 3138 (1941) CIS. PRESQUE ISLE CO. W. Katz (1939) CIS 10248. WASHTENAW CO. F. J. Hermann 9047 (1937) UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates (110), (112), KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (58). SUNCOLLORAPT CO. C. K. Dodge (86). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88).

Map 26.

14. Eleocharis rostellata Torr. Fl. N. Y. 2: 547. 1843.
Trichospyllum rostellatum (Torr.) Farwell, Mich.
 Acad. Sci., Ann. Rep., 13: 166. 1913.

Beaked Spike-Rush. A species of marl lakes, bogs and marshes. Readily rooting at tips of the sterile culms.

Specimens Examined: RAY CO. G. L. Bradford (1900) MSC. BOIS BLANC ISLAND M. T. Pingham (1938) CIS 1541, (1938) CIS 1543. CASS CO. H. S. Peppoon 69 (1904) MSC, 305 (1905) MSC; F. C. Gates 1302 (1908) UM. CARLEVOIX CO. C. F. Wheeler (1894) MSC 21482, (1894) UM. CHALCIBURN CO. J. A. Ehlers 5435 (1933) UM, 3908 (1933) UM, 6184 (1936) UM; W. Katz (1939) CIS 10218; T. H. F. Marshall 701 (1949) MSC. CLINTON CO. C. F. Wheeler (1890) MSC 21487. EMMET CO. B. L. Smits (1926) MSC; E. L. Miner (1931) UM; J. A. Ehlers 6184 (1936) UM. JACKSON CO. S. H. & D. A. Camp (1893) MSC 21488, (1894) UM. KENT CO. C. W. Fallass (1898) MSC 21483; C. W. Bazuin 1837 (1940) MSC, 1640 (1940) MSC, 1237 (1940) CIS. LAPEER CO. C. K. Dodge (1911) UM. MACKINAC CO. C. K. Dodge (1912) UM, (1912) UM, (1912) UM. MACKINAC ISLAND C. K. Dodge (1912) CIS 1539. MACOMB CO. D. D. Cooley (1847) MSC 21480. MISSISSAUGA CO. C. F. Wheeler 317 (1900) MSC. OKLAND CO. C. Billington (1916) CIS 1553, (1916) UM; O. A. Farwell 4302 (1916) UM, 4302 (1916) UM. PRESQUE ISLE CO. R. McVaugh 10294 (1949) UM, 11015 (1949) UM, 10294 (1949) CIS; T. H. F. Marshall 683 (1949) MSC, 722 (1949) MSC. TUSCOLA CO. C. A. Davis (1897) MSC 21481, (1898) CIS 10484, (1898) UM, (1898) UM. WASHTENAW CO. F. J. Hermann 9041 (1937) UM.

Specimen doubtful, young, without flower or fruit.

ALGER CO. O. A. Farwell 7602 (1924) UM.

Unconfirmed Reports: KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (58). KENEDAW CO. C. A. Farwell (100).

Map 27.

15. Eleocharis acicularis (L.) R. & S. Syst. 2: 154. 1817.
Scirpus acicularis L. Sp. Pl. 48. 1753.
Trichosymbium aciculare (L.) Farwell, Mich. Acad.
 Sci., Ann. Rep., 21: 359. 1920.

Needle Spike-Rush. Found in all types of wet habitats, along muddy shores, stream banks, bogs, marshes, etc. Occurs in all parts of Michigan.

Specimens Examined: ALPENA CO. C. F. Wheeler (1898) MSC 21589, (1898) MSC 21562. BEAVER ISLAND C. F. Wheeler 210 (1900) MSC. BERRIEN CO. G. L. Ames (1867) UM. CALHOUN CO. W. J. Beal (1898) MSC 21529. CASS CO. Anon. (1838) UM; F. C. Gates 1399 (1906) UM. CHEBOYGAN CO. J. n. Ehlers 1353 (1920) UM, 1778 (1921) UM, 5409 (1933) UM; T. H. P. Marshall 421 (1949) MSC. CHIPPewa CO. J. n. & L. S. Ehlers 1363 (1920) MSC; C. K. Dodge (1914) UM. CLINTON CO. H. C. Skeels (1898) MSC 21550. EMMET CO. W. Katz (1938) CIS 10198. GRATIOT CO. C. A. Davis (1893) MSC 21525, (1893) CIS 10375, (1893) UM. HURON CO. C. K. Dodge (1904) UM, (1903) UM. ISLE ROYALE J. L. Lowe (1930) UM; C. A. Brown 3623 (1930) UM. JACKSON CO. F. J. Hermann 9312 (1937) UM. KALAMAZOO CO. L. A. Kenoyer MSC. KENT CO. C. W. Bazuin (1933) CIS 11995, 641 (1938) MSC, 1678 (1940) MSC, 2293 (1940) CIS, 1750 (1940) MSC, 1754 (1940) MSC, 1754 (1940) CIS. Keweenaw CO. C. A. Farwell 276 (1868) MSC, (1868) MSC 21522, 7747 (1926) UM, 7747 (1926) UM; F. J. Hermann 8223 (1936) UM. LAKE CO. C. W. Bazuin (1943) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. LUCE CO. S. A. Cain & F. Segadas Vianna (1943) CIS 11327. MACKINAC CO. C. O. Erlanson 624 (1924) UM; J. n. Ehlers 4903 (1931) UM, 5436 (1933) UM. MACOMB CO. D. D. Cooley (1834) MSC; A. J. Pieters (1893) UM, (1893) UM, 35 (1893) MSC. MARQUETTE CO. C. K. Dodge (1916) UM. MENOMINEE CO. C. A. Davis (1906) UM; C. O. Grassl * 2573 (1933) UM, 2, 2921 (1933) UM, 3432 (1933) UM, * 7324 (1934) UM. MONROE CO. C. Billington (1919) MSC; C. A. Farwell 6035 (1921) UM, 6035 (1921) MSC; M. McDonald 5014 (1940) MSC. MUSKEGON CO. W. J. Beal (1898) MSC 21553. OAKLAND CO. C. Billington (1916) CIS 1526; M. T. Bingham (1934) CIS 1529, (1935) CIS 1527, (1936) CIS 1528, (1936) CIS 1530; C. A. Farwell 4268 (1916) UM, 4268 (1916) UM. ONTONAGON CO. n. T. Darlington (1922) MSC 21552. PRESQUE ISLE CO. T. H. P. Marshall 652 (1949) MSC. RODCOMB CO. E. A. Bessey & n. T. Darlington 522 (1916) MSC. ST. CLAIR CO. C. K. Dodge (1922) UM, 961 (1893) MSC. ST. JOSEPH CO. C. F. Wheeler (1890) MSC 21529. VAN BUREN CO. n. S. Pepoon 820 (1906) MSC. WASHTENAW CO. Anon. UM; Anon. (1863) UM; M. W. Harrington (1869) UM; B. A. Walpole (1912) MSC 21497. WAYNE CO. C. A. Farwell (1893) UM; M. McDonald 5623 (1949) MSC.

Unconfirmed Reports: ALGER CO. C. F. Wheeler (160). BERRIEN CO. C. Billington (45); P. E. Nebert (125). CALPOYGAN CO. E. Woollett (164). HOUGHTON CO. O. A. Farwell (96). ISLE ROYALE W. S. Cooper (61) KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (58). MANISTEE CO. F. P. Daniels (65). MAQUETTE CO. C. A. Davis (75). SCHOOL-CRAFT CO. C. K. Dodge (86). TUSCULA CO. C. A. Davis (77); C. K. Dodge (88).

Map 28.

16. Eleocharis melanocarpa Torr. Ann. Lyc. N. Y. 3:311.

Black-fruited Spike-Rush. Usually found on wet sandy shores.

Specimens Examined: KALAMAZOO CO. L. A. Kenoyer (1930) WMC, (1930) WMC, (1930) WMC; C. R. Hanes (1930) JM. KENT CO. C. W. Bazuin 1836 (1940) MSC, 1803 (1940) MSC, 1828 (1940) MSC, 1692 (1940) MSC, 1698 (1940) MSC, 1715 (1940) MSC, 705 (1939) MSC, 574 (1939) MSC, 6033 (1944) MSC, 4598 (1942) MSC, 1699 (1940) MSC, 1698 (1940) CIS. OTTAWA CO. C. W. Bazuin 1156 (1940) MSC. VAN BUREN CO. H. S. Pepson 896 (1906) MSC.

Unconfirmed Reports: ALLEGAN CO. C. W. Bazuin (44).

Map 29.

17. Eleocharis tricostata Torr. Ann. Lyc. N. Y. 3: 310. 1856.

Three-ribbed Spine-Rush. Found in wet places. Collected in Michigan only by C. W. Bazuin.

Specimens Examined: MUSKEGON CO. C. W. Bazuin 5027 (1943) MSC. OTTAWA CO. C. W. Bazuin 3230 (1941) MSC.

Map 30.

18. Eleocharis compressa Sull. Amer. Journ. Sci. 42: 50. 1842.
Eleocharis acuminata (Muhl.) Nees, Linnaea, 9: 294. 1835.
Trichophyllum acuminatum (Muhl.) Farwell, Mich. Acad. Sci., Ann. Rep. 21: 359. 1900.
Eleocharis glaucescens of Farwell, not of (Willd.) Schultes.

Flat-stemmed Spike-Rush. Found in wet or damp places. Not very common in Michigan.

Specimens Examined: CALPOYGAN CO. C. W. Bazuin 7959 (1948) CIS. CHIFFEWA CO. R. McVaugh 9133 (1948) JM, 9133 (1948) CIS. GRAND TRAVERSE CO. C. W. Bazuin 8374 (1950) MSC. KENT CO. F. P. Daniels (1898) MSC 21343; C. W. Bazuin 3362 (1941) MSC. OAKLAND CO. E. W. Erlanson 1642 (1936) JM. ST. CLAIR CO. C. K. Dodge 962 (1898) MSC.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (123).
CHEBOYGAN CO. F. C. Gates (110), (112); F. C. Gates &
 J. H. Enlers (113); L. Goe (119); E. Woollett (163).
HURON CO. C. K. Dodge (79) ISLE ROYALE W. S. Cooper (61).
KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole
 (53). KEWEEAW CO. C. A. Farwell (98). LIVINGSTON CO. F. P.
 Daniels (68). OAKLAND CO. M. T. Bingham (31).
 Map 31.

- 18a. Eleocharis compressa var. atrata Svenson, Knodora
 34: 213. 1932.
Eleocharis tenuis, in part of many Michigan authors,
 not of (Willd.) Schultes, 1824.
Trichopyllum tenuis (Willd.) Farwell, Mich. Acad.
 Sci., Ann. Rep. 21: 359. 1920.

Found in the Great Lakes area in sand dunes, sandy
 shores, and other moist places. This variety differs from
 the species in having darker spikelets and narrower culms.
 Most Michigan collectors have called it Eleocharis tenuis,
 which is not found west of the Atlantic Coastal Plain and
 Piedmont area. Often var. atrata is very difficult to
 separate from the following Eleocharis elliptica and
 critical examination of mature achenes is required to do so.

Specimens Examined: ALPENA CO. C. F. Wheeler (1893)
 CIS 14134, (1895) MSC 21537, (1898) MSC 21540. ANTRIM CO.
 W. S. Cooper (1902) MSC 21563. BEAVER ISLAND C. F. Wheeler
 211 (1900) MSC; M. C. Ries (1932) CIS 1553. BERRIEN CO.
 C. F. Wheeler (1890) MSC 21492. BOIS BLANC ISLAND M. T.
 Bingham (1938) CIS 1553, (1939) CIS 1553. CHEBOYGAN CO.
 J. H. Enlers 3235 (1926) UM; W. Katz (1939) CIS 10191.
CHIPPEWA CO. C. K. Dodge (1914) JM. EMMET CO. J. H. Enlers
 2536 (1925) UM, 2636 (1925) UM, 2636 (1925) UM; R. McVaugh
 10791 (1949) CIS. GRAND TRAVERSE BAY C. F. Wheeler (1898)
 MSC 21533. GRAND TRAVERSE CO. C. W. Bazuin 8397 (1930) UM.
HURON CO. C. K. Dodge (1909) UM. IOSCO CO. W. J. Deal &
 C. F. Wheeler (1838) MSC 21493, (1838) MSC 21504. KALAMAZOO CO.
 F. J. Hermann 9045 (1937) UM. KENT CO. C. W. Bazuin 1504
 (1940) MSC, 1497 (1940) MSC, 1504 (1940) MSC. KEWEEAW CO.
 O. A. Farwell (1832) MSC 21493, 772 (1890) MSC, 648a (1890)
 MSC. LIVINGSTON CO. C. F. Wheeler (1894) MSC 21539.
MACKINAC CO. S. A. Cain (1947) CIS 14612; S. A. Cain & F.
 Segadas Vianna (1942) CIS 11331, (1943) CIS 11330. MARQUETTE
CO. M. T. Bingham (1942) CIS 8997. MISSAUKEE CO. H. T. Dar-
 lington 577 (1916) MSC. MUSKEGON CO. C. F. Wheeler 411 (1900)
 MSC; E. A. Pessey 1136 (1916) MSC; C. W. Bazuin 3384 (1941)
 CIS, 3384 (1941) MSC. NEWAYGO CO. C. W. Bazuin 3716 (1941)
 MSC. OAKLAND CO. M. T. Bingham (1936) CIS 1555; S. A. Cain
 & F. Segadas Vianna (1948) CIS 12659. OTTAWA CO. C. W. Bazuin

1865 (1940) MSC, 1440 (1940) MSC, 1610 (1940) MSC. PRESQUE ISLE CO. J. A. Ehlers 5633 (1934) UM; F. Boynton (1947) GWP. ST. CLAIR CO. C. K. Dodge (1894) MSC 21541, (1911) UM; C. Billington (1915) CIS 1560. SCHOCLCRAFT CO. C. K. Dodge (1915) UM; J. A. Ehlers 4374 (1923) UM; M. L. Fernald & A. S. Pease 3113 (1934) UM.

Unconfirmed Reports: EMMET CO. C. W. Bazuin (44). LAKE CO. C. W. Bazuin (44).

Map 32.

19. Eleocharis elliptica Kunth, Enum. 2: 146. 1837.
Eleocharis tenuis, in part, of Michigan authors,
 not of (Willd.) Schultes, 1824.
Eleocharis capitata (L.) R. Br. var. borealis
 Svenson, Amadora 34; 200-202. 1932.

Found along shores and other wet, low areas. Difficult to differentiate from the preceding Eleocharis compressa var. atrata. Indeed, it should not be surprising if they both are not simply two expression of a variable complex. It is beyond the scope of a report such as this to investigate such intriguing possibilities; suffice to say that the thought has frequently entered the author's mind.

Specimens Examined: ALCONA CO. W. J. Beal & C. F. Wheeler (1888) MSC 21494. EMMET CO. R. McVaugh 9489 (1948) UM, 10791 (1949) UM. INGHAM CO. H. C. Skeels (1895) MSC 21490. ISLE ROYALE C. A. Brown 3895 (1930) UM. KENT CO. C. W. Bazuin 1221 (1940) MSC. KEWEEENAW CO. F. J. Hermann 3843 (1936) UM. OAKLAND CO. M. T. Bingham (1936) CIS 1561. PRESQUE ISLE CO. R. McVaugh 10907 (1949) UM. ST. CLAIR CO. Anon. (1888) UM. SCHOCLCRAFT CO. J. A. Ehlers 4276 (1926) UM. WASHTENAW CO. Anon. UM.

Unconfirmed Reports: KALAMAZOO CO. C. R. & F. N. Hanes (124).

Map 33.

SPECIES OF ELEOCHARIS ERRONEOUSLY OR DOUBTFULLY REPORTED FOR MICHIGAN

Eleocharis palustris var. glabrescens (R. & S.) Willd. Reported by Marjorie T. Bingham (31) as found in wet meadows of Oakland Co. No such name was found in the literature by this writer.

Eleocharis uniglumis (Link) Schultes. One specimen 8346 (1929) UM from Livonia, Wayne Co. collected by O. A. Farwell and called by him E. uniglumis, is such young material that it is impossible to tell what it is, but it is the writer's decided opinion that it most certainly should not

be called E. uniglumis. The species has also been reported by M. T. Bingham (51) from Oakland Co., by W. F. Holt (138) from Isle Royale, and by C. A. Davis (77) from Tuscola Co. The writer feels they all meant one of the uniglumate Eleocharis, perhaps E. culva.

Eleocharis tenuis (Willd.) Schultes. The specimens labelled with this name have turned out to be either E. compressa var. atrata or E. elliptica. Since the unconfirmed reports may refer to either or both, they are here listed separate from both of them.

Unconfirmed reports: CHARITY ISLANDS C. K. Dodge (81). CALBOYGAN CO. F. C. Gates (110). KENT CO. E. J. Cole (88). MACKINAC ISLAND C. K. Dodge (82). MANISTEE CO. F. P. Daniels (65). MARQUETTE CO. A. Dacmowski (65); C. K. Dodge (85). ST. JOSEPH CO. F. P. Daniels (67). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88). WASHTENAW CO. E. A. Walpole (156). SOUTHERN MICHIGAN J. Wright (165).

4. PSILOCARYA Torr. Ann. Lyc. N. Y. 3: 359. 1836.

A small genus of Australia, South America, the West Indies and eastern United States. One species is found in Michigan.

1. Psilocarya scirpoides Torr. Ann. Lyc. N. Y. 3: 360. 1836.

Long-beaked Bald-Rush. Found in wet soil of shores and marshes. It seems to be restricted to the southwest part of Michigan, with most specimens from Kent and Kalamazoo Counties.

Specimens Examined: KALAMAZOO CO. L. A. Kenoyer (1931) WMC; C. R. Hanes (1934) UM, (1935) UM, (1935) UM. KENT CO. E. J. Cole (1893) MSC 21688, (1898) MSC 21691, (1898) CIS 11846, (1899) UM, (1891) UM; C. W. Hazuin 3999 (1941) MSC, 3999 (1941) CIS. MUSKEGON CO.

Map 34.

5. BULBOSTYLIS Kunth ex C. B. Clarke, Hook. f. Fl. Br. Ind. 6: 651. 1893.

Stenopnyllus Raf. Neog. 4. 1825.

A genus, chiefly tropical, with about 50 species, only one of which is found in Michigan.

1. Bulbostylis capillaris (L.) C. B. Clarke, Hook. f. Fl. Br. Ind. 6: 651. 1893.

- Scirpus capillaris L. Sp. Pl. 49. 1753.
Fimbristylis capillaris A. Gray, Man. Bot. N. U.
 St. ed. V. 567.
Stenomyllus capillaris (L.) Britt. Bul. Torrey
 Club 2: 30. 1894.
Bulbostylis capillaris, var. synostachys Fern.
 Rhodora 19: 184. 1917.

Slender Bulbostylis. Found usually on dry, sandy openings. Newaygo County is the farthest north this species is known to occur.

Specimens Examined: CALHOUN CO. Anon. (1833) UM.
JACKSON CO. G. A. Hicks (1895) MSC 21946. KALAMAZOO CO.
 C. Billington (1900) UM; (1900) WMC; C. R. Hanes (1934)
 UM. KENT CO. E. J. Cole (1896) UM, (1899) MSC 21939;
 C. W. Bazuin 31 (1933) MSC, 1762 (1940) MSC. MACOMB CO.
 D. D. Cooley MSC 21941; O. A. Farwell 6096 (1921) UM;
 6096 (1921) UM, 6096 (1921) UM. NEWAYGO CO. R. McVaugh
 9830 (1943) UM. OAKLAND CO. C. Billington (1916) CIS
 1678; (1916) UM, (1917) WMC; O. A. Farwell 4539 (1917)
 UM. ST. CLAIR CO. W. S. Cooper (1903) MSC 21948; C. K.
 Dodge (1904) CIS 1679; (1904) MSC 21937; (1904) UM;
 O. A. Farwell 8063 (1927) UM, 8063 (1927) UM, 8063 (1927)
 UM. ST. JOSEPH CO. F. P. Daniels (1898) MSC 21943.
WASHTENAW CO. N. W. Harrington (1869) UM; C. A. Davis
 (1902) UM, (1902) UM; C. Billington (1919) UM; O. A.
 Farwell 5355 (1919) UM; 5355 (1919) UM; E. A. Walpole
 (1921) MSC 21936; F. G. Gustafson (1924) UM. WAYNE CO.
 C. F. Wheeler (1875) MSC 21947. SOUTHERN MICHIGAN D.
 Doughton (1833) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125).
ST. JOSEPH CO. O. A. Farwell (104). WAYNE CO. O. A. Farwell
 (99).

Map 35.

6. FIMBRISTYLIS Vahl, Enum. 2: 283. 1806.

This largely tropical genus of some 125 species is represented in Michigan by only two of its members.

KEY TO THE MICHIGAN SPECIES OF FIMBRISTYLIS

- A. Style 2-parted; achene lenticular; perennial plants with firm, hardened bases.
 - 1. F. Drummondii.
- A. Style 3-parted; achene 3-angled; soft-based annuals.
 - 2. F. autumnalis.

1. Fimbristylis Drummondii Boeckl. Flora, 41: 606. 1888.
Fimbristylis castanea, of some American authors,
in part, not of (Michx.) Vahl, Enum. 2: 291. 1806.
Iria castanea (Michx.) Farwell, Mich. Acad. Sci.,
Ann. Rep., 21: 359. 1920.
Scirpus spadicus L. Sp. Pl. 61. 1753.
Fimbristylis spadicus, var. castanea A. Gray, Man.
ed. 5: 568. 1867.

Drummond's Fimbristylis. Said to grow on dry or moist soils of oak and pine barrens, in sterile meadows and prairies. The only specimen seen by the writer was collected by C. K. Dodge on "prairie-like ground" on Harsen's Island.

Specimens Examined: ST. CLAIR CO. Harsen's Island, C. K. Dodge (1904) UM.

Unconfirmed Reports: SOUTHERN MICHIGAN J. Wright (165).
Map 36.

2. Fimbristylis autumnalis (L.) R. & S. Syst. 2: 97. 1817.
Scirpus autumnalis L. Mant. 2: 180. 1781.
Fimbristylis geminata Kunth, Enum. Pl. 2: 247. 1837.
Fimbristylis Frankii Steud. Syn. Pl. Cyp. 111. 1855.
Fimbristylis mucronulata (Michx.) Blake, Rhodora
20: 25. 1918.
Iria autumnalis (L.) O. K. var. geminata (Lestib & Nees)
Farwell, Mich. Acad. Sci., Ann. Rep., 21: 359.
Fimbristylis autumnalis, var. mucronulata (Michx.)
Fern. Rhodora 37: 393. 1935.

Slender Fimbristylis. Moist sandy and peaty soils. Found as far north as Cheboygan County in Michigan. The writer has included Fernald's var. mucronulata with the species. For those who desire, the following key may be used to distinguish them:

- a. Umbels simple or compound; spikelets ovate lanceolate or lance-elliptic; achenes about 9.75 mm. long.
typical autumnalis.
- b. Umbels usually compound; spikelets more cylindric to slenderly fusiform; achenes about 0.5 mm. long.
var. mucronulata.

Specimens Examined: CASS CO. H. S. Pepoon 103 (1904)
MSC. CHEBOYGAN CO. R. McVaugh 11023 (1949) UM, 11023 (1949)
CIS. GRATIOT CO. C. A. Davis (1898) CIS 10545. INGHAM CO.
Anon. (1887) MSC 21671; Anon. (1887) MSC 21676. JACKSON CO.

S. H. & D. R. Camp (1893) UM; G. H. Hicks (1893) MSC 21663, (1893) MSNC, (1894) MSC 21667; F. J. Hermann 9301 (1937) UM. KALAMAZOO CO. L. A. Kenoyer (1938) MSC; C. R. Hanes (1935) UM. KEWEE CO. E. J. Cole (1899) UM; C. W. Bazuin 18 (1938) MSC, 622 (1938) MSC, 1737 (1940) MSC, 1774 (1940) MSC, CIS 12270, CIS 12245. MCATCAH CO. C. A. Davis (1898) UM, (1898) UM. MUSKEGON CO. C. D. McLouth (1901) MSC 21664, (1901) MSC 12666, (1901) MSC 21672. OTTAWA CO. C. W. Bazuin 5075 (1942) CIS. WASHTENAW CO. M. W. Harrington (1862) UM; F. J. Hermann 7552 (1935) MSC, 7552 (1935) UM.

Unconfirmed Reports: CLINTON CO. C. F. Wheeler (188). MANISTEE CO. F. P. Daniels (65). WASHTENAW CO. B. A. Walpole (186). SOUTHERN MICHIGAN J. Wright (185).

Map 37.

7. SCIRPUS L. Sp. Pl. 47. 1753.

A very large and very variable genus with a world-wide distribution, most common in the temperate zones. Over 200 species are recognized, of which are found in Michigan.

KEY TO THE MICHIGAN SPECIES OF SCIRPUS

- A. Inflorescence without a true persistent involucre, with the lowest deciduous scale of the spikelet longer or larger than the other scales; spikelets solitary.
- B. Upper basal sheaths membranous, bearing flat blades 2 cm. or more in length; culms triangular, scabrous angled at the summit; achene beakless; perianth bristles terete, setulose, equal to or shorter than the achene; denuded rachilla flexuous.
 - 1. S. Clintonii.
- B. Upper basal sheaths coriaceous or firm, bearing a firm, terete or involute blade less than 2 cm. long; achene beaked; perianth bristles flat and smooth or crinkled, longer than the achene; denuded rachilla straight.
- C. Culms wiry, terete, smooth; scales of spikelet 5 or 6; perianth bristles 2.5--5 mm. long at maturity, twice the length of the achene; achene 2 mm. long; denuded rachilla 1--2 mm. long with 4 or 5 depressions.
 - 2. S. cespitosus
var. callosus.
- C. Culms soft, 3-angled, scabrous on the angles; scales of the spikelet 10--20; perianth bristles at maturity 1--3 cm. long, white and crinkled; achene 1.5 mm. long; denuded rachilla 2--4 mm. long with 9--19 depressions.

3. S. mudsonianus.

- A. Inflorescence with a true persistent foliaceous involucre of one to numerous bracts.
- D. Involucre a single bract appearing like a continuation of the culm; culms leafless or leafy only at the base.
- E. Inflorescence usually of 1--few, sessile spikelets.
- F. Annuals with slender, terete or barely 3-angled, tufted culms; achenes black or blackish.
- G. Achene with conspicuous transverse corrugations, plano-convex, black when ripe; style 2-cleft; scales awned or cuspidate.

4. S. Hallii.

- G. Achene smooth or slightly pitted, olivaceous to black; scales blunt or merely mucronulate.
- H. Achene plano-convex (flat on one side, rounded on the other), smooth; bristles when present delicate and slender.
- I. Achene unequally biconvex (bulged on both faces) somewhat pitted; bristles usually present, stout.

6. S. furskianus.

- F. Perennials with rhizomes; culms solitary or scattered; achenes whitish, orb, olivaceous or brown.
- I. Rhizomes soft and weak; culms slender, upper leaf-sheath open or freely splitting, with thin friable band and orifice; spikelets cylindrical; achenes distinctly trigonous, 2.5--4 mm. long.
- J. Culms terete; spikelet solitary; achenes 2.7--3.5 mm. long; bristles usually shorter than the beak of the achene; generally submersed aquatics.

7. S. subterminalis.

- J. Culms triangular; spikelets several; achenes 3.2--4 mm. long; bristles exceeding beak of achene.

8. S. Torreyi.

- I. Rhizomes firm and hard; culms stouter; upper leaf-sheath closed, with firm band and orifice; spikelets ovoid; achenes plano-convex or obscurely triangular, 2.5--3 mm. long.
- K. Culms 1--6 mm. thick at upper sheath; upper sheath concave but not notched at the orifice, bearing an elongate, linear, sharp-pointed blade; involucre linear, 2--15 cm. long, acute.

9. S. americanus.

- K. Culms 4--10 mm. thick at the upper leaf sheath; upper sheath with V-shaped notch in the orifice, bearing a short, lanceolate, blunt-tipped blade, 3--15 mm. long; involucre lance-triangular, 1--3.5 cm. long, blunt.

10. S. Olneyi

E. Inflorescence of numerous, clustered spikelets on (usually) elongate branches; perennials with terete culms and strong, hard rhizomes.

L. Styles mostly 2-parted; achenes plano-convex; scales tawny, deep-brown or reddish, scarious-membranaceous; spikelets ovoid to cylindric.

M. Scales glabrous or nearly so, the green midrib prominent and excurrent as an awn; culm soft; basal sheath membranous with scarious margin becoming lacerate; achenes 1.5--2 mm. long; bristles usually longer than the achene.

11. S. validus var. creper.

M. Scales viscid-pubescent, flecked with numerous red or brown gummy spots, midrib not prominent, projecting as a short mucro; culms firm; basal sheath firm or subcoriaceous, its margin becoming fibrillose; achenes 2.5--3 mm. long; bristles shorter than to equalling the achene.

12. S. acutus.

L. Styles 3-parted; achenes distinctly 3-angled; scales pale-brown to drab or whitish-green, firm or subcoriaceous; spikelets lance-acuminate to ellipsoid.

13. S. heterochaetus.

D. Involucre of 2 or more flat leaves; culms leafy.

N. Culms sharply triangular; rhizomes with thick corm-like enlargements; spikelets 3--15 in number, 1.5--4 cm. long; achenes 3-angled, 4--5 mm. long.

14. S. fluviatilis.

N. Culms obtusely angled (sometimes sharply so at the summits) from close leafy crowns; spikelets 2--15 mm. long, very numerous; achenes trigonous or lenticular, about 1 mm. long.

O. Bristles retrorsely barbed; culms solitary to few; the base bearing thick scaly rhizomes.

P. Lower sheaths (at least) red-tinged; bristles barbed nearly to the base.

Q. Achenes lenticular; styles 2-cleft; bristles 4; scales blunt or merely mucronulate; most sheaths red-tinged at the base, smooth or barely nodulose when dry.

15. S. rubrotinctus.

Q. Achenes trigonous; styles 3-cleft; bristles 3 or 6; scales with subulate-acuminate tips; only the lowest sheaths red-tinged, prominently septate-nodulose when dry.

16. S. expansus.
 P. Sheaths uniformly green; bristles barbed only above the middle, scarcely reaching the beak of the achene.
17. S. atrovirens.
 O. Bristles smooth, bent or curled; non-stoloniferous plants in tufts or stools.
 R. Bristles at maturity scarcely exceeding the scales; scales reddish-brown with a conspicuous green midrib.
18. S. lineatus.
 R. Bristles at maturity greatly exceeding and often hiding the scales, strongly crimped or curled.
 S. Spikelets mostly all sessile in glomerules of 3--15; scales reddish-brown; involucre reddish-brown to dark brown with blackish bases.
19. S. cyperinus.
 S. Spikelets all pedicelled or at least the lateral spikelets of each ultimate group pedicelled.
 T. Involucres and spikelets pale brown or drab to reddish or terra-cotta; perianth bristles reddish or whitish-brown.
 U. Involucres and scales red-brown to terra-cotta; wool (perianth bristles) red-brown; the longer rays of the umbel scabrous, except at the base.
20. S. rubricosus.
 U. Involucres and scales whitish-brown to dull brown or drab; wool brownish; longer rays of the umbel scabrous at the tips.
21. S. pedicellatus.
 T. Involucres and spikelets black or blackish to dark brown; wool whitish or pale.
22. S. atrocinctus.
1. Scirpus Clintonii Gray, Amer. Journ. Sci., Ser. II. 38: 290. 1864.
Scirpus planifolius, of early Michigan authors, not of Muhl. 1817.

Clinton's Club-Rush. Found on dry banks, bluffs, and ridges and ledges, in thin, open woods, pine plains, white oak slopes and along tuffy shores.

Specimens Examined: ERY CO. C. A. Davis (1900) UM.
CLINTON CO. C. F. Wheeler (1877) MSC, 21770, (1880) CIS
 14109, (1875) UM. INGHAM CO. L. H. Bailey (1886) MSC 21765;
 C. F. Wheeler (1900) MSC 21739, (1900) MSC 21795. KENT CO.
 C. F. Wheeler (1882) UM. LIVINGSTON CO. C. F. Wheeler &
 S. O. Longyear (1893) MSC 21766. MUSCHE CO. D. D. Cooley
 (1847) MSC 21770. OAKLAND CO. C. Billington (1913) WMC,
 (1915) CIS 1624, (1916) CIS 1623, (1916) UM, (1916) UM;
 O. A. Farwell 4917 (1918) UM. ST. CLAIR CO. C. K. Dodge &
 J. W. Stacey (1900) MSC 21788, (1900) UM. SCHOOLCRAFT CO.
 F. J. Hermann 7491 (1936) UM. WASHTENAW CO. F. J. Hermann
 6494 (1935) MSC, 6551 (1935) MSC, 6514 (1935) UM. COUNTY
UNKNOWN UM; H. T. Darlington 51 Wolf Lake (1921) MSC.

Unconfirmed Reports: KEWEENAW CO. O. A. Farwell (107)
OAKLAND CO. M. T. Bingham (31). SCHOOLCRAFT CO. M. L. Fernald
 (108).

Map 38.

2. Scirpus cespitosus L. var. callosus Regel. Fl. Ross.
 ed. 2, 21. 1824.
Scirpus cespitosus L. Sp. Pl. 48. 1753.
Scirpus caespitosus of many authors.

Tufted Club-Rush, Scaly Club-Rush, or Niggerhead. A
 plant of the Arctic tundra, found in Michigan in the Upper
 Peninsula, Isle Royale and in Alpena County, in sphagnum bogs,
 dry rock crevices, sandy shores and calcareous beaches. A
 true representative of the boreal flora in Michigan.

Specimens Examined: ALPENA CO. E. A. Bessey B&D 2025₂
 (1918) MSC; H. T. Darlington B&D 2030 (1918) MSC. BOIS BLANC
ISLAND M. T. Bingham (1937) CIS 1662. ISLE ROYALE J. B.
 McFarlin 2401 (1930) UM; C. A. Brown 3101 (1930) UM, 3385
 (1930) UM; H. & V. Bailey 4109 (1942) UM, 4109 (1942) MSC.
KEWEENAW CO. O. A. Farwell 6631 (1928) UM; F. J. Hermann 7789
 (1936) MSC, 8001 (1936) UM. MARQUETTE CO. D. Houghton (1832)
 UM; A. Dacnowski (1906) UM, (1906) UM, (1906) UM. SCHOOL-
CRAFT CO. Fernald & Pease 5132 (1934) UM.

Unconfirmed Reports: BOISELANT ISLAND C. K. Dodge (85).
ISLE ROYALE W. S. Cooper (61); W. P. Holt (138). MARQUETTE CO.
 W. J. Beal (46). SCHOOLCRAFT CO. C. K. Dodge (86).

Map 39.

3. Scirpus hudsonianus (Michx.) Fern. Rhodora 8: 161. 1906.
Eriophorum alpinum L. Sp. Pl. 53. 1753.

Alpine Cotton-Grass. A species of cold bogs and wet
 shores, mostly in Northern Michigan.

Specimens Examined: ALGER CO. F. J. Hermann 6398 (1934) UM; S. A. Cain (1947) CIS 13873. ALPENA CO. C. F. Wheeler (1895) MSC 21390. ANTRIM CO. W. S. Cooper (1902) MSC 21591. BOIS BLANC ISLAND M. T. Bingham (1939) CIS 1565. EAY CO. G. M. Bradford (1894) MSC. CHIECYGAN CO. J. H. Emiers 2041 (1922) UM, 2505 (1922) UM, 2505 UM; T. A. F. Marshall 595 (1949) MSC. CHIPPEWA CO. N. A. Wood (1912) UM; C. K. Dodge (1914) UM; E. A. Bessey 102 (1927) MSC; R. McVaugh 9185 (1948) UM. CRAWFORD CO. W. J. Beal & C. F. Wheeler (1888) MSC 61347, (1888) MSC 61348. EMMET CO. J. H. Emiers 2618 (1923) UM; R. McVaugh 10808 (1949) CIS, 10808 (1949) UM. GRAND TRAVERSE CO. C. W. Bazuin 8402 (1950) MSC, 8403 (1950) MSC, 8402 (1950) CIS. ISLE ROYALE University Party (1868) UM; C. A. Brown 3055 (1930) UM, 3096 (1930) UM, 3296 (1930) UM; H. & V. Bailey 4227 (1942) MSC, 4322 (1942) MSC, 4227 (1942) UM, 4322 (1942) UM. KEWEENAW CO. O. A. Farwell (1886) MSC 21587, 690 (1888) MSC, 6603 (1923) CIS, 6603 (1923) UM, F. J. Hermann (1926) UM. MACKINAC CO. R. McVaugh 11003 (1949) UM, 11008 (1949) CIS. PRESQUE ISLE CO. C. K. Dodge (1914) UM. SCHOOLCRAFT CO. C. K. Dodge (1915) CIS 1647.

Unconfirmed Reports: CHARLEVOIX CO. W. J. Beal (46). GRAND TRAVERSE CO. W. J. Beal (46). ISLE ROYALE W. P. Holt (138); W. L. Mcatee (140). MENOMINEE CO. C. A. Davis (75). MARQUETTE CO. A. Dachnowski (83); C. K. Dodge (83). OAKLAND CO. M. T. Bingham (51). TOSCOLA CO. C. K. Dodge (88). LAKE SUPERIOR DISTRICT J. W. Foster (109).

Map 40.

4. Scirpus Hallii Gray, Addenda, Man. ed. 2. 1803.

This species has been collected only once in Michigan by C. D. McLouth in the vicinity of Pine Lake in Muskegon County. The label reads "Habitat. Sand in slope of receding lake." According to Gray's Manual (23), it occurs as follows: "Peaty and sandy shores, very local, Ga. and Fla. to e. Tex.; Winter P., Middlesex Co., Mass.; Athens, Menard Co., Ill.; s. Mo. and St. Louis, Mo. (formerly)." McLouth's collection is truly an interesting addition to the scattered stations known for this diminutive species. With the location of the specimen known as well as it is, someone should attempt to relocate it, if it still should be there.

Specimen Examined: MUSKEGON CO. C. D. McLouth (Aug. 22, 1900) MSC 21787.

Unconfirmed Report: OAKLAND CO. L. T. Bingham (51).

Map 41.

5. Scirpus Smithii Gray, Man. Bot. N. U. S. ed. 5. 565. 1837.
Scirpus Smithii, var. setosus Fern. Rhodora 3: 232. 1901.
Scirpus Smithii, var. levisetus Fassett, Rhodora 23: 42. 1921.
Scirpus Smithii, forma setosus Fern. Rhodora 44: 479. 1942.
Scirpus Smithii, forma levisetus (Fassett) Fern. l. c.

A plant of mud banks and shores. The two forms can be separated from the typical species thus:

- a. bristles absent or merely rudimentary.
 Typical Smithii.
 a. bristles present.
 b. bristles slender, delicate, retrorsely barbed,
 equalling or longer than the achene.
 forma setosus.
 b. bristles delicate, elongate and smooth.
 forma levisetus.

From the writer's experience, this species is extremely difficult to distinguish from the following species (S. Pursnianus). Both display numerous, overlapping morphological characters. In fact one is inclined to wonder whether the differences are imaginary or the similarities real. In any case they seem to be, not two, but several expressions of a polymorphic complex. The problem of population studies, in the field, where the answer to the riddle lies, is not in the realm of the present studies.

Specimens Examined: BAY CO. G. M. Bradford (1900) MSC.
CLINTON CO. C. F. Wheeler (1890) MSC 21903. INGHAM CO.
 C. F. Wheeler (1891) MSC 21902, (1890) UM, (1891) CIS 14110,
 (1891) MSC. KALAMAZOO CO. L. A. Kenoyer (1930) WMC, (1930)
 WMC, (1931) WMC; C. R. Hanes (1935) UM, (1935) UM, (1935) UM,
 (1934) UM. KENT CO. E. J. Cole (1898) UM, (1898) MSC 21859;
 C. W. Bazuin 1761 (1940) MSC, 1751 (1940) MSC, 691 (1939) MSC.
MONTCALM CO. C. A. Davis (1900) UM, (1900) UM; MENOMINEE CO.
 C. O. Grassl 2306 (1935) UM. OSHTON CO. Mrs. M. H. Bingham
 (1936) CIS 14306; M. T. Bingham (1936) CIS 1646.

Unconfirmed Reports: KALAMAZOO CO. F. J. Hermann (128).
MACOMB CO. Wheeler & Smith (161). MANISTEE CO. F. P. Daniels
 (65). ST. JOSEPH CO. F. P. Daniels (66). SOUTHWESTERN MICHIGAN
 H. S. Pepoon (147).

Map 42.

6. Scirpus Pursnianus Fern. Rhodora 44: 479. 1942.
Scirpus debilis Pursh, Fl. Am. Sept. 1: 55. 1814,
 not Lam. 1791.
Scirpus debilis, var. Williamsii Fernald, Rhodora
 3: 232. 1901.
Scirpus Pursnianus, forma Williamsii Fern. Rhodora
 44: 479. 1942.

Essentially the same habitats as the preceding species. In the forma williamsii the bristles are wanting. The remarks under S. Smithii are pertinent to this species as well.

Specimens Examined: BAY CO. G. M. Bradford (1900) MSC. CASS CO. H. S. Pepoon 57 (1904) MSC; F. C. Gates 1355 (1906) UM. CLINTON CO. C. F. Wheeler (1891) MSNC, (1891) UM. KALAMAZOO CO. C. R. Hanes (1935) UM; Anon. UM; V. Janson 21 (1950) MSC. KENT CO. E. J. Cole (1899) MSC 21838, (1899) UM, (1899) UM; C. W. Bazuin 2095 (1940) MSC. MACOMB CO. D. D. Cooley (1843) MSC. MUSKOGON CO. C. D. McLouth (1901) MSC 21879, 21844, 21843, and 21842.

Unconfirmed Reports: GRATIOT CO. W. J. Beal (46). HURON CO. C. K. Dodge (80). KALAMAZOO CO. F. J. Hermann (123). MANISTEE CO. W. J. Beal (46). ST. CLAIR CO. C. K. Dodge (79). ST. JOSEPH CO. F. P. Daniels (66).

Map 43.

7. Scirpus subterminalis Torr. Fl. N. U. S. 1: 47. 1824.

Scirpus subterminalis, forma terrestris (Paine) Fern. Rhodora 45: 268. 1943.

Water Club-Rush. An aquatic perennial with slender, creeping rhizomes, found in ponds, lakes, and bogs. The terrestrial form is known as forms terrestris.

Specimens Examined: CHEBOYGAN CO. J. A. Ehlers 1693 (1921) UM. CLINTON CO. A. T. Darlington (1918) MSC. EMMET CO. J. A. Ehlers 3855 (1935) UM. GRATIOT CO. C. A. Davis (1895) CIS 10607, (1895) UM, (1895) UM. INGHAM CO. C. F. Wheeler & G. H. Hicks (1893) MSC 21858; C. F. Wheeler (1893) MSNC, (1893) UM. JACKSON CO. Anon. (1838) UM. KALAMAZOO CO. C. R. Hanes (1938) MSC; H. A. Tanner 87 (1950) MSC. MACOMB CO. D. D. Cooley (1845) MSC 19450. MARQUETTE CO. A. Dachnowski (1906) UM; C. K. Dodge (1916) UM. OAKLAND CO. Mrs. Bingham (1936) CIS 14305. PRESQUE ISLE CO. F. Boynton (1947) GWP. ST. CLAIR CO. C. K. Dodge 997 (1906) MSC (1906) UM. VAN BUREN CO. H. S. Pepoon 780 (1907) MSC. WASHTENAW CO. F. K. Sparrow (1946) UM. COUNTY UNKNOWN Anon. UM.

Unconfirmed Reports: BAY CO. W. J. Beal (46). CHEBOYGAN CO. F. C. Gates (112); A. Coburn (57). GENESEE CO. W. J. Beal (46). HURON CO. C. K. Dodge (52). IONIA CO. W. J. Beal (46). ISLE ROYALE C. A. Brown (52); W. S. Cooper (61). ROSCOMMON CO. W. J. Beal (46). TUSCOLA CO. C. K. Dodge (88). SOUTHERN MICHIGAN J. Wright (165).

Map 44.

8. Scirpus Torreyi Olney, Proc. Prov. Frank. Soc. 1: 32. 1847.

Torrey's Bulrush. Occurs along the borders of ponds and lakes.

Specimens Examined: HOUGHTON CO. C. D. Richards (1948) UM. INGHAM CO. L. H. Bailey (1888) MSC 21863; C. F. Wheeler (1892) MSC 21860, (1900) MSC 21861, (1892) MSNC, (1891) CIS 14229, (1892) UM. KENT CO. Dr. Hyser (1898) CIS 12108. MACKINAC CO. F. Segadas Vianna (1949) CIS 16735, (1949) CIS 14628.

Unconfirmed Reports: CLINTON CO. C. F. Wheeler (188). KENT CO. E. J. Cole (88).

Map 45.

9. Scirpus americanus Pers. Syn. 1: 68. 1805.
Scirpus pungens Vahl, Enum. 2: 285. 1806.

Three-Square. Found along lake and pond shores, marshes, bogs, stream edges, inter-dune ponds and other low swampy grounds. Common throughout the state.

Specimens Examined: ALCONA CO. C. F. Wheeler (1888) MSC 12743. ALPENA CO. H. T. Darlington L&D 2032 (1918) MSC. BAY CO. G. M. Bradford (1900) MSC. BEAVER ISLAND M. C. Ries 637 (1932) CIS. FERRIEN CO. H. T. Darlington 1688 (1917) MSC. BOIS BLANC ISLAND M. T. Bingham (1938) CIS 1608. CASS CO. H. S. Pepoon 650 (1906) MSC. CHARLEVOIX CO. C. F. Wheeler (1892) MSNC. CHEBOYGAN CO. C. F. Wheeler (1890) MSC 21752; F. C. Gates 182 (1911) MSC; J. H. Enlers 1216 (1920) UM, 5309 (1933) UM; W. Katz (1939) CIS 10966; S. A. Cain & F. Segadas Vianna (1948) CIS 11503; T. A. P. Marshall 388 (1949) MSC. CLINTON CO. H. T. Darlington 285 (1916) MSC; G. Lauff 45 (1950) MSC. EMMET CO. C. W. Fallass (1896) MSC 21575; R. McVaugh 9477 (1948) UM. GARDEN ISLAND E. Force (1935) UM. GRATIOT CO. Anon. (1837) UM; C. A. Davis (1895) UM, (1895) UM, (1895) CIS 10898. HOUGHTON CO. P. F. Hypio 174 (1950) MSC. HURON CO. C. A. Davis (1896) MSC 21746; C. K. Dodge (1909) UM. INGHAM CO. Anon. (1887) MSC 21738; E. Schmiat (1923) MSC; H. A. Tanner 89 (1950) MSC. IOSCOCO CO. W. J. Beal & C. F. Wheeler (1888) MSC 21744. KENT CO. C. W. Bazuin 4 (1938) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACKINAC CO. J. A. & L. S. Enlers 1409 (1920) MSC; J. A. Enlers 1409 (1920) UM; C. O. Erlanson 700 (1924) UM; S. A. Cain & F. Segadas Vianna (1949) CIS 14627, (1948) CIS 11504; S. A. Cain (1947) CIS 14555; F. Segadas Vianna (1949) CIS 16736. MACOMB CO. D. D. Cooley (1845) MSC 21741; A. J. Pieters (1893) UM, (1893) UM, (1893) UM. MANICLINEE CO. C. O. Grassl * 2808 (1933) UM, 2802 (1933) UM, 3817 (1933) UM, 7596 (1936) UM. MONROE CO. L. McDonald 5008 (1947) MSC, 5389 (1949) MSC. MUSKEGON CO. C. D. McLouth (1901) MSC 21754; E. A. Bessey 1137 (1916) MSC, 1161 (1916) MSC. OAKLAND CO. C. A. Farwell (1895) UM, 4295 (1916) UM; C. Billington (1917) UM, (1917) CIS 1603; M. T. Bingham (1934) CIS 1604, (1934) CIS 1605, (1936) CIS 1606, (1936) CIS 1607; S. A. Cain &

F. Segadas Vianna (1948) CIS 11802, (1948) CIS 11801, (1948) CIS 11821. OTTAWA CO. C. H. Kauffman (1910) UM; C. W. Bazuin 1408 (1943) MSC. PESQUE ISLE CO. J. A. Enlers 5446 (1935) UM; F. Boynton (1947) GWR. SCHEGONG CO. H. T. Darlington 600 (1916) MSC. ST. CLAIR CO. C. K. Dodge 998 (1897) MSC, (1897) UM; O. A. Farwell 6748 (1893) UM. SCHENECTADY CO. J. A. Enlers 4575 (1929) UM. VAN BUREN CO. H. T. Darlington 1530 (1917) MSC. WASHINGTON CO. C. Billington (1918) MSC; F. G. Gustafson (1924) UM; anon. UM.

Unconfirmed Reports: BEAVER ISLAND H. T. Darlington (71). BERRIEN CO. P. E. Hebert (125). CHARLIE ISLAND C. K. Dodge (81). CHIPPWA CO. C. K. Dodge (87). HURON CO. G. A. Coons (60). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (82). LAKE CO. C. E. Patterson (143). MACKINAC ISLAND C. K. Dodge (82). MANISTEE CO. I. E. W. Olson (144); F. P. Daniels (65). ST. JOSEPH CO. F. P. Daniels (66). SCHENECTADY CO. C. K. Dodge (86). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88). WASHINGTON CO. F. B. H. Brown (23); B. A. Walpole (156). WAYNE CO. O. A. Farwell (90); A. L. Cornelius (143).

Map 46.

10. Scirpus Olneyi Gray, East. Journ. Nat. Hist. 5: 238. 1845.

Found in saline to brackish marshes. Miss Cole's specimen, the only one seen by this writer, was collected at "Salt Springs, Grand Rapids".

Specimen Examined: KENT CO. E. J. Cole (1899) MSC 21854.

Unconfirmed Report: CLINTON CO. C. F. Wheeler (158).

Map 47.

11. Scirpus validus Vahl, var. creber Fern. Rhodora 45: 223. 1945.

Scirpus lacustris of many authors; not of L. 1753.

Scirpus validus of many Michigan authors; not of Vahl 1806.

Soft-stemmed Bulrush. Common in marshes, swampy ground, edges of ponds; lakes, streams, in ditches and other wet areas.

Specimens Examined: ALCONA CO. W. J. Beal & C. F. Wheeler (1888) MSC 21749. ARENAC CO. C. F. Wheeler 264 (1900) MSC. BARRY CO. S. B. Neuges 12 (1950) MSC. BLAY CO. G. M. Bradford (1900) MSC. BERRIEN CO. H. T. Darlington 1602 (1917) MSC, 1685 (1917) MSC. CASS CO. H. S. Pepoon 262 (1907) MSC. CHEBOYGAN CO. C. F. Wheeler (1890) MSC 21210; J. A. Enlers 5405 (1935) UM, 6239 (1937) UM, 5878 (1935) UM, 5937 (1935) UM; S. A. Cain & F. Segadas Vianna (1948) CIS 11513; W. Katz (1939) CIS 10265. CHIPPWA CO. C. K. Dodge (1914) UM. CLARE CO.

E. A. Bessey 663 (1916) MSC. CLINTON CO. G. Lauff 47 (1950) MSC. C. Hiltz (1921) MSC. EMMET CO. J. H. Enlers 1722 (1921) UM, 1722 (1921) UM, 2840 (1922) UM; R. McVaugh 9617 (1948) UM. GRATIOT CO. C. A. Davis (1891) UM, (1891) UM. HOUGHTON CO. P. F. Hypio 172 (1950) MSC. HURON CO. C. K. Dodge (1909) UM. INGHAM CO. Anon. (1827) MSC 21265; E. Schmidt (1923) MSC. ISLE ROYALE J. B. McFarlin 2159 (1930) UM. KALAMAZOO CO. E. H. G. & G. O. V. 73 (1933) MSC, 73 (1933) MSC; C. W. Bazuin 73 (1933) MSC; V. Janson 23 (1950) MSC. LAPEER CO. C. K. Dodge (1911) UM. LEKAWEE CO. W. J. Beal (1866) MSC 21868; Mrs. J. T. Boyce 68 (1905) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACOMB CO. D. D. Cooley (1840) MSC 21869; A. J. Pieters (1890) UM. MONROVIE CO. C. O. Grassl 2819 (1933) UM. MONTCALM CO. C. F. Wheeler 345 (1900) MSC, (1900) MSC 21892. MUSKEGON CO. W. J. Beal (1898) MSC 21760, (1898) MSC 21893. OAKLAND CO. C. Billington (1916) UM, (1918) CIS 1670, (1922) CIS 1671; O. A. Farwell 4624 (1927) UM; M. T. Bingham (1934) CIS 1672, 1666 and 1673, (1933) CIS 1636, (1936) CIS 1668, 1633, 1665, 1635 and 1667; S. A. Cain (1947) CIS 11527; S. A. Cain & F. Segadas Vianna (1948) CIS 11525, 11523, 11524, 11514, 11515 and 12642. PRESQUE ISLE CO. J. H. Enlers 5452 (1933) UM; F. Boynton (1947) GWP. ROSCOMMON CO. H. T. Darlington 402 (1916) MSC. SAGINAW CO. H. T. Darlington 276 (1916) MSC. ST. CLAIR CO. C. K. Dodge 153 (1910) MSC, 153 (1910) MSC, (1916) UM, (1909) UM; S. A. Cain (1948) CIS 11516. VAN BUREN CO. L. A. Pennington (1910) UM. WASHTENAW CO. Anon. (1828) UM; Anon. (1838) UM; J. Wright ? (1838) UM; A. Sager ? (1838) UM; Anon. (1833) UM; Anon. (1861) UM; C. D. LaRue (1915) UM; J. H. Enlers 708 (1918) UM; F. Cobb (1918) UM; C. A. Kauffman (1920) UM; F. G. Gustafson (1934) UM. WAYNE CO. A. H. Rusby (1884) UM; O. A. Farwell 4387 (1916) UM; C. Billington (1915) CIS 1669; C. O. Grassl 4569 (1932) UM; M. McDonald 5778 (1950) MSC. WEXFORD CO. C. W. Bazuin (1941) CIS 11179.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). CHEBOYGAN CO. S. M. Coulter (62); F. C. Gates (110), (111), (112). DICKINSON CO. C. A. Davis (75). HURON CO. G. H. Coons (60); C. A. Davis (74). ISLE ROYALE C. A. Brown (52); W. S. Cooper (61). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (58). KEWEEKAW CO. O. A. Farwell (96). MANISTEE CO. F. P. Daniels (65); I. E. W. Olson (144). MARQUETTE CO. A. Dacmowski (63); C. K. Dodge (83). OAKLAND CO. C. A. Davis (76). ROUND ISLAND J. E. Potzger (150). ST. JOSEPH CO. F. P. Daniels (66). SCHOOLCRAFT CO. C. K. Dodge (86). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88). WASHTENAW CO. G. P. Burns (54); C. A. Farwell (96); B. A. Walpole (156); E. Pettee (148).

Map 48.

12. Scirpus acutus Muhl. ex Bigelow, Fl. Dost. 15. 1814.

Scirpus occidentalis (Wats.) Chase, Rhodora 6:
66. 1904.

Scirpus occidentalis, var. congestus Farwell, Mich.
Acad. Sci., Ann. Rep. 19: 243. 1917.

Hard-stemmed Bulrush. This species, like the preceding one is found in all kinds of watery habitats throughout the state.

Specimens Examined: ALCONA CO. H. T. Darlington (1918) MSC 21873. BEAVER ISLAND M. C. Ries 609 (1932) CIS, 609 (1932) CIS. BENZIE CO. W. J. Beal & C. F. Wheeler (1885) MSC 21896. BOIS BLANC ISLAND M. T. Bingham (1935) CIS 1658, (1939) CIS 1659. CHARLEVOIX CO. R. McVaugh 10540 (1949) UM. CHEBOYGAN CO. F. C. Gates 189 (1911) MSC; J. H. Enlers 1134 (1927) MSC, 1133 (1930) UM, 1134 (1920) UM, 5406 (1935) UM, 5926 (1935) UM, 6142 (1936) UM; W. Katz (1939) CIS 10264; T. H. P. Marshall 432 (1949) MSC, 745 (1949) MSC. CHAFFETON CO. F. J. Hermann 7222 (1935) UM. CLINTON CO. H. C. Skeels (1895) MSC 21859. EMMET CO. A. T. Crozier (1886) MSC 21901; J. H. Enlers 1721 (1921) UM. GOGEBIC CO. H. T. Darlington E&D 2486 (1919) MSC, 2486 (1919) UM, (1919) UM. HIRON CO. C. K. Dodge (1909) UM. INGHAM CO. H. C. Skeels (1895) MSC 21890; S. B. Hedges 85 (1930) MSC. ISLE ROYALE University Party (1868) UM; A. E. Foote (1868) UM; J. E. McFarlin 2693 (1930) UM. JACKSON or LIVINGSTON CO. E. B. Lains (1913) UM. KALAMAZOO CO. F. C. Nuggett 12 (1933?) MSC. KENT CO. C. W. Bazuin 1 (1933) MSC, 5 (1933) MSC, 11 (1933) MSC, 22 (1933) MSC, 4 (1933) MSC, 12 (1933) MSC, 7 (1933) MSC, 9 (1933) MSC. Keweenaw CO. O. A. Farwell 677 (1885) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC, (1947) MSC. LAKE CO. C. W. Bazuin 3656 (1941) MSC. MACKINAC CO. J. H. & L. S. Enlers 1395 (1920); J. H. Enlers 1395 (1920) UM, 5471 (1934) UM, 2764 (1923) UM, 2764 (1923) UM; C. K. Dodge (1912) UM; Mrs. C. Goodrich (1922) UM; C. O. Erlanson UM; S. A. Cain (1947) CIS 14558. MARQUETTE CO. C. K. Dodge (1916) UM. MONROE CO. M. McDonald 5505 (1949) MSC, 5549 (1949) MSC, 5596 (1949) MSC. OAKLAND CO. O. A. Farwell 4377 (1916) CIS, 4377 (1916) UM, 4377 (1916) UM, 4376 (1916) UM, 4376 (1916) UM, 4294 (1916) UM; E. W. Erlanson 1641 (1926) UM; C. Billington (1917) CIS 1652; M. T. Bingham (1935) CIS 1654, (1936) CIS 1657. ONTONAGON CO. H. T. Darlington (1923) MSC 21898. PRESQUE ISLE CO. F. Boynton (1947) GWP. ROUND ISLAND M. T. Bingham (1935) CIS 1601. ST. CLAIR CO. C. K. Dodge 159 (1910) MSC, (1909) UM, (1909) UM, (1909) UM. SCHOOLCRAFT CO. J. H. Enlers 4253 (1929) UM; S. A. Cain (1947) CIS 14553. WASHINGTON CO. Anon. (1836) UM; T. G. Williamson & C. C. Harvey (1901) UM. WAYNE CO. O. A. Farwell UM, (1892) UM; M. McDonald 5777 (1950) MSC.

Unconfirmed Reports: BAY CO. C. K. Dodge (85). CHARITY ISLANDS. C. K. Dodge (81). CHIFFEWA CO. C. K. Dodge (87). KALAMAZOO CO. C. R. & F. N. Hanes (124). MACKINAC ISLAND C. K. Dodge (88). SCHOOLCRAFT CO. C. K. Dodge (88). TULSCOLA CO. C. K. Dodge (88). WAYNE CO. C. M. Coleman (143).

Map 49.

13. Scirpus heterochaetus Chase, Rhodora 6: 70. 1904.

Prairie Bulrush. A western species of the same watery habitats that the two preceding species frequent. The two specimens examined were both collected in the Lansing area in Ingham County. One is marked "L.A.C." the other "Lansing". Other than that, nothing more is known about them.

Specimens Examined: INGHAM CO. Anon. (1871) MSC 21823; Anon. (1871) MSC 21825.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates & J. H. Eulers (113). GRAND TRAVERSE CO. W. L. Mcatee (140). MURRON CO. C. K. Dodge (80).

Map 50.

14. Scirpus flaviatilis (Torr.) A. Gray, Man. 527. 1846.

River Bulrush. Along rivers and lakes, in marshes. Most commonly found in southern Michigan.

Specimens Examined: BAY CO. G. M. Bradford (1900) MSC; H. T. Darlington 1579 (1917) MSC, 1579 (1917) MSC. CHIFFEWA CO. E. A. Bessey 255 (1927) MSC. GOGHEIC CO. E. A. Bessey (1922) MSC. KENT CO. C. W. Bazuin 1282 (1940) MSC. LENAWEE CO. W. J. Beal (1867) MSC 21843; Mrs. J. T. Dotce 70 (1903) MSC. MACOMB CO. A. J. Pieters (1895) UM. MONROE CO. C. Billington (1919) CIS 1642; O. A. Farwell 6644 (1925) UM, 6644 (1925) UM, M. McDonald 5757 (1930) MSC. CITAWA CO. C. A. Kauffman (1910) UM. ST. CLAIR CO. C. K. Dodge (1897) MSC 21848, (1903) CIS 1643, (1903) UM. VAN BUREN CO. H. S. Pepon 164 (1904) MSC. WAYNE CO. C. F. Wheeler (1892) MSC 61550; O. A. Farwell 4343 (1916) UM, 4343 (1916) UM, (1916) CIS 1641; C. Billington (1918) WMC; Anon. (1877) UM; C. O. Grassl 4572 (1932) UM, 4572 (1932) UM; M. McDonald 5555 (1949) MSC.

Unconfirmed Reports: BAY CO. C. K. Dodge (85). CLINTON CO. W. J. Beal (46); C. F. Wheeler & C. F. Wheeler (161). KALAMAZOO CO. C. R. & F. N. Hanes (124).

Map 51.

15. Scirpus rubrotinctus Fern. Rhodora 2: 20. 1900.

Scirpus microcarpus Presl, var. rubrotinctus (Fern.) Jones, Bull. Univ. Mont. Biol. Ser. 13: 20. 1910.

Scirpus sylvaticus L. var. digynus Boeck. Linnaea 36: 727. 1870.

Scirpus sylvaticus of Michigan authors, in part, not of L. 1753.

Wood Bulrush. Found in low, wet areas, swamp sand clearings, swamps. Its distribution in Michigan is northern.

Specimens Examined: ALGER CO. C. K. Dodge (1916) UM; S. A. Cain & F. Segadas Vianna (1943) CIS 11512. RAY CO. C. A. Davis (1900) UM. DELTA CO. C. F. Wheeler (1892) MSC 93838, (1892) UM. KENNELAW CO. C. A. Farwell 549a (1887) LBNK; F. J. Hermann 7833 UM. MARQUETTE CO. A. Duchnowski (1906) UM; C. K. Dodge (1916) UM, (1916) JM, 130 (1916) CIS; M. T. Bingham (1940) CIS 9340.

Unconfirmed Reports: ISLE ROYALE C. A. Brown (32); W. S. Cooper (61). MANISTEE CO. F. F. Daniels (65).

Map 52.

16. Scirpus expansus Fern. Rhodora 40: 293. 1943.

Scirpus sylvaticus, in part, of many Michigan authors, not of L. 1753.

A rather rare species that occurs in the southwestern part of Michigan. The southern counterpart of the northern S. rubrotinctus.

Specimens Examined: BERRIEN CO. H. T. Darlington 1456 (1917) MSC. KALAMAZOO CO. F. W. Rapp 5179 (1941) MSC. KENT CO. C. W. Bazuin 2 (1933) MSC, 1986 (1940) MSC. MUSKEGON CO. C. D. McSouth (1899) MSC 21880; H. T. Darlington 1189 (1916) MSC. OTTAWA CO. C. W. Bazuin 1886 (1940) MSC. VAN BUREN CO. L. A. Kenoyer (1933) MSC.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (123). JACKSON CO. G. H. Hicks (133). KALAMAZOO CO. C. R. & F. W. Hanes (124). KENT CO. E. J. Cole (38). KENNELAW CO. O. A. Farwell (96); the writer doubts the veracity of this report for he has not seen the specimens Farwell speaks of. Whether Farwell could have meant S. rubrotinctus, is questionable for in the same breath he has cited that species as well. OAKLAND CO. C. A. Farwell (96). SOUTHWESTERN MICHIGAN H. S. Pepoon (147).

Map 53.

17. Scirpus atrovirens Willd. Enum. Pl. hort. Berol. 79. 1803.

Scirpus brunneus, of Wright (165), not of Muhl. 1817.

Scirpus polyphyllus, of some Michigan authors, not of Vahl, 1806.

Scirpus georgianus Harper, Bul. Torrey Club 27: 331. 1900.

Scirpus atrovirens var. georgianus (Harper) Fern. Rhodora 23: 134. 1921.

Scirpus atrovirens var. pallidus of some Michigan authors, not of Britt. 1889.

Scirpus atrovirens var. pycnocephalus Fern. Rhodora 8:163. 1906.

- Scirpus atrovirens var. georgianus f. angustispicatus
 Fern. Rhodora 45: 296. 1945.
Scirpus atrovirens var. georgianus f. cepalanthus
 Fern. l. c.
Scirpus atrovirens var. georgianus f. viviparus M.-
 Victorin, Trans. Roy. Soc. Canada, ser. 3, 23, pt.
 2, sect. 5: 267. 1929.
Scirpus atrovirens subvar. viviparus Farwell, Amer.
 Midl. Nat. 11: 72. 1928.
Scirpus atrovirens f. proliferous Hermann, Rhodora
 40: 77. 1938.
Scirpus atrovirens f. sychnocephalus (Cowles) Blake,
 Rhodora 15: 161. 1913.

Dark-green Bulrush. Our commonest cyperaceous plant, found in wet meadows, bogs, marshes and all kinds of low wet habitats that are not too shaded.

This species has often been split into numerous varieties and forms because of its variability. However, the combinations of variations overlap and intergrade too much, to make satisfactory separations of all the expressions the species assumes. The writer prefers to think of this species as a population. Therefore, he makes no attempt to classify the specimens seen into varieties and forms but includes them all under the same Scirpus atrovirens.

Specimens Examined: ALGER CO. C. F. Wheeler (1900) MSC 21809. ALPENA CO. H. T. Darlington B&D 1860 (1918) MSC. ARENAC CO. C. F. Wheeler (1895) MSC 21801, 269 (1900) MSC 21806 and 21877. BALTIMORE CO. C. K. Dodge 441 (1916) CIS, (1916) UM. BARRY CO. S. B. Hedger 14 (1930) MSC. BAY CO. G. M. Bradford (1900) MSC, (1900) MSC. BEAVER ISLAND M. C. Ries 711 (1932) CIS. BEAVER CO. G. L. Ames (1867) JM, (1867) UM; H. T. Darlington 1335 (1917) MSC; C. Billington (1920) MSC 21802 (1920) JM. BOIS BLANC ISLAND M. T. Bingham (1938) CIS 1621, (1939) CIS 1620. CHEBOYGAN CO. J. A. Ehlers 1101 (1920) MSC, 1101 (1920) UM, 1101 (1920) UM, 2011 (1922) UM, 2011 (1922) UM, 1550 (1921) UM, 5330 (1933) UM; T. A. P. Marshall 448 (1949) MSC, 438 (1949) MSC, 737 (1949) MSC. CLINTON CO. D. M. Brooks 20 (1950) MSC. DELTA CO. A. Dachnowski (1900) UM. EATON CO. L. J. Cole (1895) MSC 21904. EMMET CO. J. A. Ehlers 2086 (1922) UM, 2086 (1922) UM, 242 (1919) UM; T. A. P. Marshall 731 (1949) MSC. GENESEE CO. Dr. Clark MSC 21805. GOGEBIC CO. H. T. Darlington B&D 3064 (1919) UM. GRATIOT CO. C. A. Davis (1890) UM, (1890) MSC 21915. HOUGHTON CO. F. J. Hermann 1344 (1927) UM. INGHAM CO. Anon. (1855) MSC 21913; Anon. (1887) MSC 21906; Anon. MSC 21991; H. T. Darlington 202 (1916) MSC;

E. Schmidt (1923) MSC; C. F. Wheeler (1901) MSC 21807, 21875, and 21878. ISLE ROYALE J. B. McFarlin 2138 (1930) UM. JACKSON CO. J. Bright ? (1888) UM, (1888) UM, (1888) UM. KALAMAZOO CO. F. G. Nuggett 73 (1934?) MSC, 102 (1938) MSC. KENT CO. G. Fyfe & J. Snaddick (1890) MSC 21914; C. W. Bazuin 1720 (1940) MSC, 1943 (1940) MSC, 1997 (1940) MSC, 13 (1938) MSC. KENNEBEC CO. O. A. Farwell (1880) MSC 21300; F. J. Hermann 9266 (1937) UM. LENAPE CO. W. J. Beal (1868) MSC; Mrs. J. T. Boyce 31 (1908) MSC, 37 (1908) MSC. LIVINGSTON CO. D. E. Lynch (1947) MSC. MACKINAC CO. C. O. Erlanson 681 (1924) UM, 681 (1924) UM. MACOMB CO. D. D. Cooley (1880) MSC 21919; A. J. Pieters (1893) UM. MENOMINEE CO. C. O. Grassl 2, 3298 (1933) UM, 4, 2534 (1933) UM, 4, 2534 (1933) CIS. MISSAUGEE CO. A. T. Darlington 724 (1916) MSC. MONROE CO. C. Billington (1919) UM; M. McDonald 5199 (1949) MSC. MUSKEGON CO. W. J. Beal (1898) MSC 21903. OAKLAND CO. C. Billington (1922) CIS 1617, (1924) WMC; M. T. Bingham (1934) CIS 1613, (1935) CIS 1618, 1612, 1613, 1609, (1936) CIS 1611, 1613, 1614; S. A. Cain & F. Segadas Vianna (1943) CIS 11511. ORTONAGON CO. H. T. Darlington B&D 3064 (1919) MSC, (1923) UM; H. T. Darlington & E. A. Bessey (1923) MSC 21800. OTTAWA CO. L. R. Pennington (1910) UM; C. W. Bazuin 2045 (1940) MSC, 1335 (1940) MSC. PRESQUE ISLE CO. J. H. Emers 5447 (1933) UM; F. Boynton (1947) GWP, (1947) GWP. SAGINAW CO. H. T. Darlington 277 (1916) MSC. ST. CLAIR CO. C. K. Dodge UM, (1891) MSC 21917, (1892) UM, (1892) UM, (1899) UM, (1899) UM, (1899) UM, (1900) UM, (1903) MSC 21835, (1909) UM. SCHOOLCRAFT CO. J. H. Emers 4349 (1929) UM; S. A. Cain & F. Segadas Vianna (1943) CIS 11520. VAN BUREN CO. H. S. Pepoon 256 (1903) MSC, 643 (1903) MSC. WASHTENAW CO. Anon. UM; Anon. (1888) UM; M. W. Harrington (1870) UM; C. A. Davis (1892) UM; F. Cobb (1913) UM; F. G. Gustafson (1923) UM, (1924) UM; F. J. Hermann 2402 (1930) UM, 9266 (1937) UM. WAYNE CO. O. A. Farwell (1899) CIS 9665, 11547 (1899) CIS, 11547 (1899) UM, 11547 (1899) UM, 11547 (1895) UM, 5622 (1920) UM, 5622 (1920) CIS; C. Billington (1915) CIS 1616, (1920) CIS 1619, (1920) UM; J. M. Sutton (1916) UM; B. A. Walpole (1920) MSC 21871; M. McDonald 5091 (1949) MSC.

Unconfirmed Reports: BEARIEN CO. P. E. Hebert (125). CHARITY ISLANDS C. K. Dodge (81). CHERLEVOIX CO. E. A. Bessey (123). CHEBOYGAN CO. F. C. Gates (110). CHIPPEWA CO. C. K. Dodge (87). HILLSDALE CO. F. W. Bishop (143); Mrs. L. A. Jones (143). MURCON CO. C. A. Davis (74), (80). ISLE ROYALE C. A. Brown (52). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (55). MACKINAC ISLAND C. K. Dodge (82). MANISTEE CO. F. P. Daniels (65). MARQUETTE CO. A. Dacnowski (63); C. K. Dodge (83); E. J. Hill (130). OCEANA CO. E. Myers (143). ST. JOSEPH CO. F. P. Daniels (66). SCHOOLCRAFT CO. C. K. Dodge (86). TUSCULA CO. C. A. Davis (77); C. K. Dodge (80). WASHTENAW CO. A. Dacnowski (64); E. Pettie (143).

18. Scirpus lineatus Michx. Fl. Bor.-Amer. 1:32. 1803.
Eriophorum lineatum (Michx.) Benth. & Hook. Gen.
 Pl. 3: 1022. 1883.

Reddish Bulrush. Common in low, wet grounds, swamps, bogs, along ponds, streams, etc. especially in the southern part of the state.

Specimens Examined: RAY CO. G. M. Bradford (1896) MSC. BEAVER ISLAND M. C. Ries 730 (1932) CIS. BERRIEN CO. G. L. Ames (1867) UM; H. T. Darlington (1917) MSC. CASS CO. A. S. Pepoon 132 (1903) MSC. CLINTON CO. C. F. Wheeler 199 (1899?) MSC; D. M. Brooks 22 (1930) MSC. GENESEE CO. Anon. MSC 21829. INGHAM CO. E. Schmidt (1923) MSC; H. T. Darlington 271 (1916) MSC 21826. KALAMAZOO CO. L. A. Kenoyer (1932) WMC; E. A. G. & E. C. V. 107 (1933) MSC; F. J. Hermann 9018 (1937) UM; F. C. Huggett 157 (1938) MSC. KENT CO. B. E. Livingston (1896) MSC 21821; C. W. Bazuin 1 (1935) MSC, 32 (1939) MSC. KEWEEAW CO. O. A. Farwell 799 (1891) MSC. LENAWEE CO. Mrs. J. T. Boyce 26 (1903) MSC. LIVINGSTON CO. D. M. Lynch (1947) MSC. MACOMB CO. D. J. Cooley (1849) MSC 21832. MENOMINEE CO. C. O. Grassl 7942 (1935) CIS, 7942 (1935) UM, 7942 (1935) UM. MONROE CO. Anon. (1890) MSC 61526; M. McDonald 5009 (1947) MSC. OSHTON CO. E. W. Erlanson 1650 (1926) UM, 1650 (1926) UM; M. T. Pingham (1936) CIS 1663, (1934) CIS 1650; S. A. Cain & F. Segadas Vianna (1948) CIS 11518. OTSEGO CO. R. McVaugh 9700 (1943) UM. OTTAWA CO. C. W. Bazuin 1587 (1940) MSC. SAGINAW CO. H. T. Darlington 290 (1916) MSC. ST. CLAIR CO. C. K. Dodge (1828) MSC 21810, 966 (1904) MSC, (1902) UM, (1904) UM. VAN BUREN CO. A. S. Pepoon 263 (1904) MSC. WASHTENAW CO. Anon. (1838) UM; Anon. (1838) UM; Anon. (1838) UM; Anon. UM; Anon. (1870) UM; A. J. Pieters (1895) UM; F. G. Gustafson (1923) UM; C. O. Erlanson 1691 (1926) UM, 1691 (1926) UM; C. O. Grassl 2, 7769 (1937) UM. WAYNE CO. C. Billington (1915) CIS 1649, (1916) CIS 1648; F. J. Podolski 25 (1917) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Nebert (125). CHEBOYGAN CO. F. C. Gates & J. A. Emers (113). GRATIOT CO. W. J. Beal (46). HILLSDALE CO. F. W. Bishop (143). HURON CO. C. K. Dodge (80). KALAMAZOO CO. C. R. & F. W. Hanes (124). KENT CO. E. J. Cole (58). MARQUETTE CO. A. Dacnowski (63). ST. JOSEPH CO. F. P. Daniels (66). TULCOLA CO. C. A. Davis (77); C. K. Dodge (88). WASHTENAW CO. O. A. Farwell (96); B. A. Walpole (156). WAYNE CO. O. A. Farwell (96).

Map 55.

19. Scirpus cyperinus (L.) Kunth, Enum. 2: 170. 1807.
Eriophorum cyperinum L. Sp. Pl. ed. 2. 77. 1762.
Scirpus erisporus of Wright's Catalog (165).
Scirpus Eriophorum var. cyperinus A. Gray, Man.
 Ed. 2, 501. 1886.

Scirpus cyperinus var. pelius Fern. Rhodora 8: 164. 1906.
Eriophorum cyperinum var. pelium (Fern.) Farwell, Mich.
 Acad. Sci., Ann. Rep. 19: 253. 1917.
Eriophorum cyperinum var. pelium f. condensatum (Fern.)
 Farwell, Mich. Acad. Sci., Ann. Rep. 21: 350. 1919.

Wool-Grass. A common species in Michigan, found in wet meadows, marshes, bogs, ditches, etc. Very variable, as anyone who has traced its synonymy can testify. The writer, although recognizing that the variety pelius, with its darker involucels and scales, may with difficulty be separated from the species, has included it with the latter because there is so much intergradation between the extremes of the two. No significant geographical distribution between them seems to occur within the state, although, numerous writers have asserted that the variety is more common northward. From the writer's experience they appear to occur side by side, rather indiscriminately, in the same areas. Some of the synonyms for S. cyperinus have also been used for the closely related species, S. pedicellatus, S. rubricosus and S. atrocinctus. It is therefore difficult to determine which one of the four species is referred to by some of the unverified reports found in the literature.

Specimens Examined: ALGER CO. C. F. Wheeler 186 (1900) MSC. ALLEGAN CO. D. L. Allen (1937) MSC. ARENAC CO. C. F. Wheeler 325 (1900) MSC, 324 (1900) MSC, 324 (1900) MSC, 325 (1900) MSC. BAR CO. G. M. Bradford (1896) MSC. BEAVER ISLAND M. C. Ries 915 (1932) CIS. BOIS BLANC ISLAND M. T. Bingham (1938) CIS 1629. CASS CO. F. C. Gates 1893 (1906) JM. CALBOYGAN CO. F. C. Gates 242 (1911) MSC, 516 (1911) MSC; J. H. Enlers 162 (1916) UM, 163 (1916) UM, 1143 (1920) UM, 1215 (1920) UM, 1123 (1920) MSC, 1215 (1920) MSC, 5413 (1933) UM, 5438 (1933) UM; T. H. P. Marshall 706 (1949) MSC. CHIPPEWA CO. C. K. Dodge (1914) UM; F. J. Hermann 7240 (1935) UM, (1935) MSC 21797. CLINTON CO. C. Hiltz (1931) MSC. EMMET CO. C. W. Fallass (1896) MSC 21775; J. H. Enlers 1813 (1921) JM; W. Katz (1939) CIS 10211. GENESEE CO. Anon. MSC 21209. GOGEBIC CO. H. T. Darlington B&D 2438 (1919) MSC, B&D 2528 (1919) MSC, B&D 2682 (1919) MSC, B&D 2682 (1919) UM. GRATIOT CO. C. A. Davis (1892) MSC 21777. JURON CO. C. K. Dodge (1909) UM. INGHAM CO. Anon. (1892) MSC 61533, (1892) MSC 18596; M. Craig 1936 (1905) MSC, 1933 (1905) MSC. KALAMAZOO CO. Anon. (1838) UM; F. W. Rapp 6445 (1946) CIS, 6402 (1945) UM, 6403 (1945) JM. KENT CO. J. Shaddick & H. Skeels (1896) MSC 21782; C. W. Bazin 2 (1937) MSC, 8 (1938) MSC, 1914 (1940) MSC, 1984 (1940) MSC, 2100 (1940) MSC, 1942 (1940) MSC. LENAWEE CO. Mrs. J. T. Boyce 32 (1905) MSC. LIVINGSTON CO. J. H. Enlers 5210 (1932) UM; D. M. Lynch (1947) MSC, (1947) MSC. MACKINAC CO. J. H. Enlers 4531 (1929) JM. MACOMB CO. D. D. Cooley (1843) MSC 21779,

(1880) MSC. MANISTEE CO. E. A. Bessey (1921) MSC. MARQUETTE CO. A. Dachnowski (1906) UM; C. K. Dodge (1916) UM, (1916) UM; M. T. Bingham (1942) CIS 9341. MANISTEE CO. C. O. Grassl 3, 2900 (1933) UM, 2, 3144 (1933) UM. MONTCALM CO. B. A. Barlow (1900) MSC 21780. OAKLAND CO. O. A. Farwell 4358 (1916) UM, 4358 (1916) UM; C. Billington (1919) WMC, (1922) CIS 1632; M. T. Bingham (1934) CIS 1633, 1636 and 1637, (1934) CIS 1625 and 1640 (1936) CIS 1634 and 1635. ST. CLAIR CO. C. K. Dodge (1897) CIS 1626 (1897) CIS 1631, (1909) UM; O. A. Farwell 7265 (1924) UM, 7265 (1924) UM; S. A. Cain (1942) CIS 11317. SCHOCLOCKRAFT CO. J. A. Enlers 4075, 4076, and 4183 (1929) JM. VAN BUREN CO. H. T. Darlington 1313 (1917) MSC. WASHTENAW CO. Anon. (1838) UM, (1838) UM; Anon. UM: F. G. Gustafson (1924) UM. WAYNE CO. C. Billington (1916) CIS 1633, (1916) UM; O. A. Farwell 3027g (1918) JM; M. McDonald 5095 (1949) MSC.

Unconfirmed Reports: BERRIEN CO. P. E. Nebert (125). ISLE ROYALE C. A. Brown (52); W. F. Holt (133). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENNEBEC CO. O. A. Farwell (96). MANISTEE CO. F. F. Daniels (65); I. E. W. Olson (144). MARQUETTE CO. E. J. Hill (136). ONTONAGON CO. H. T. Darlington (69). ST. JOSEPH CO. F. F. Daniels (66). SCHOCLOCKRAFT CO. C. K. Dodge (86). TUSCULA CO. C. A. Davis (77); C. K. Dodge (88). WASHTENAW CO. E. N. Transeau (155); B. A. Walpole (156).
Map 56.

20. Scirpus rubricosus Fern. Rhodora 47: 124. 1945.

Scirpus erioporum Michx. Fl. Bor.-Amer. 1: 33,
nomen superfluum. 1803.

Scirpus cyperinus var. erioporum (Michx.) Kuntze,
Rev. Gen. Pl. 2: 757. 1891.

Southern wool-Grass. Found in about the same types of habitat as the preceding species which it closely resembles except for the mostly pedicelled spikelets of this species. Definitely southern, it reaches into Michigan only in Cass County. Some of the references under Scirpus cyperinus might pertain to this species but its nomenclature over the years has become so garbled as to present problem in itself and one which could not be accurately solved. Therefore, only the more common synonyms, those which have been applied to actual specimens, are here given.

Specimens Examined: CASS CO. H. S. Pepton 261 (1904) MSC, 435 (1905) MSC, 1728 (1906) UM.

Map 57.

21. Scirpus pedicellatus Fern. Rhodora 2: 16. 1900.
Scirpus eriophorum var. laxus A. Gray, Man. ed.
 2: 501. 1886.
Eriophorum cyperinum var. pedicellatum (Fern.)
 Farwell, Mich. Acad. Sci., Ann. Rep., 21: 360. 1919.
Scirpus pedicellatus var. pullus Fern. Rhodora
 2: 17. 1900.

Long-stalked Wool-Grass. In wet habitats. Whether this is a good species or not is questionable. To the writer it appears merely a pale color-phase of either the preceding or the following species. Its pale, straw-colored scales and involucres could be variations of the reddish S. rubricosus or the blackish S. atrocinctus. The writer personally prefers the treatment accorded these "species" given by either Beetle (7) or Gilly (29) where they are reduced to varieties of S. cyperinus. But since Gray's Manual, Ed. 8, will for some time be the most widely followed authority, the species considered in it are followed here. As a species S. pedicellatus seems to have no clear-cut pattern of distribution as do the preceding and the following species - another indication of its dubious status.

Specimens Examined: ALGER CO. C. F. Wheeler (1895) MSC 21855. EMAGA CO. C. K. Dodge (1916) UM. CHEBOYGAN CO. S. A. Cain & F. Segadas Vianna (1943) CIS 11819. INGHAM CO. T. H. P. Marshall 989 (1949) MSC. ISCO CO. W. J. Bear & C. F. Wheeler (1888) MSC 21821. KALAMAZOO CO. C. R. Hanes (1936) UM. MARYJETTE CO. C. K. Dodge (1916) UM.

Unconfirmed Reports: Keweenaw CO. O. A. Farwell (96). OAKLAND CO. M. T. Bingham (51).

Map 55.

22. Scirpus atrocinctus Fern. Proc. Amer. Acad. 34: 502. 1899.
Scirpus atrocinctus var. brachypodus Fern. l. c. 503.
Eriophorum cyperinum var. atrocinctus (Fernald)
 Farwell, Mich. Acad. Sci., Ann. Rep. 2: 59. 1900.
Eriophorum cyperinum var. brachypodium (Fern.) Farwell,
 Mich. Acad. Sci., Ann. Rep. 6: 204. 1904.

Northern wool-Grass. A northern species of low, wet places, bogs, meadows. Most commonly occurring in the Upper Peninsula of Michigan.

Specimens Examined: ALCONA CO. H. T. Darlington 2330 (1918) MSC; J. A. Enlers 1129 (1920) MSC. ALGER CO. C. K. Dodge (1916) UM. FOIS BLANC ISLAND M. T. Bingham (1939) CIS 1627 and 1628. CHEBOYGAN CO. J. A. Enlers 123 (1916) UM, 1129 (1920) UM, 3275 (1925) UM; W. Katz (1939) CIS 10298. CHIPPEWA CO. C. K. Dodge (1914) UM; N. A. Wood (1914) UM;

R. McVaugh 9775 (1948) UM. CRAWFORD CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11505. EMMET CO. J. H. Enlers 2616 (1923) UM. GOGHEIC CO. H. T. Darlington B&D 2697 (1919) MSC; E. A. Bessey B&D 3388 (1920) UM. HOUGHTON CO. F. J. Hermann 1247 (1927) UM, 8100 (1936) UM - this specimen is var. brachypodium; P. F. Hupio 173 (1950) MSC. ISLE ROYALE J. B. McFarlin 2375 (1930) UM; C. A. Brown 3582, 3585, 3581, 3555, 3257, and 3414 UM; H. & V. Bailey 4246 and 4424 (1942) MSC, 4246 and 4424 (1942) UM. KELLEENA CO. O. A. Farwell 673 (1888) MSNC, (1888) MSC 21819, (1904) UM; F. J. Hermann 7894 (1936) UM; C. D. Richards 2578 (1949) UM. LUCE CO. R. McVaugh 9527 (1948) UM. MACKINAC CO. J. H. Enlers 4548 (1929) UM. MARQUETTE CO. B. Barlow (1901) MSC 21786; A. Dacumowski (1906) 6 specimens UM. ONTONAGON CO. H. T. Darlington (1923) MSC 21816. PRESQUE ISLE CO. F. Boynton (1947) GWP. ROSCOMMON CO. C. A. Bessey 540 (1916) MSC. SCHOOLCRAFT CO. C. K. Dodge (1915) UM, (1915) UM; J. H. Enlers 4576 (1929) UM.

Unconfirmed Reports: ALGER CO. C. F. Wheeler (160). CHEBOYGAN CO. D. Dean & H. Coburn (78); F. C. Gates (110), (112); E. Woollett (163), (164). ISLE ROYALE W. S. Cooper (61). MARQUETTE CO. C. K. Dodge (83). WAYNE CO. O. A. Farwell (90).

Map 59.

SPECIES OF SCIRPUS DOUBTFULLY OR ERRONEOUSLY REPORTED FOR MICHIGAN

Scirpus cernuus Vahl. The writer has encountered two specimens, apparently duplicates, collected by B. A. Walpole and labeled this species. One specimen from the Herbarium of the University of Michigan bears the following inscription, written, in what appears to be O. A. Farwell's handwriting: "Scirpus cernuus Vahl, Said by B. A. Walpole to be growing wild near Pittsfield, Mich. May 1, 1919. B. A. Walpole." The other specimen from the Herbarium of the Cranbrook Institute of Science reads: "Scirpus cernuus, Vahl. Ypsilanti May 1, 1919. B. A. Walpole". and bears the Cranbrook number 14307. It is strongly suspected that Mr. Farwell identified the specimens. This writer, however, finds that the specimens, whatever they may be, are too young (collected May 1) to be recognized even if they were native. Beetle (6) states that S. cernuus is found in North America in "Oregon, California, and northern Mexico". The species is not mentioned in Walpole's "Flora of Washtenaw" (156) published in 1924.

Scirpus maritimus L. has been included in the Michigan flora by C. F. Wheeler & E. F. Smith (161) and by Beal & Wheeler (43). Both refer to Wright's Catalog (165) and apply to Wright's citation of Scirpus macrostachyos Muhl., which is an old name for S. robustus Pursh. Since both S. maritimus

and robustus are coastal species it appears questionable, at this late date, whether one of them might have been cited by Wright or whether he meant S. fluviatilis. Unfortunately no specimens of S. fluviatilis collected by the anonymous collectors of 1888 have been encountered. Beal (46) in 1904 did not mention this reference, apparently because of the doubtfulness of the original report.

Scirpus polyphyllus Vahl, is often mentioned by writers and specimens bear that label. However, the plants so named turn out to be perfectly good Scirpus atrovirens. The reports, then, are no more valid than the identities the author has checked. It is a plant with a range more southern than southern Michigan occurring, according to Deam (11) in southern Indiana.

3. ERIOPHORUM L. Sp. Pl. 82. 1753.

This is a small genus with a distribution in the boreal, alpine and north-temperate zones. Of some ten or twelve recognized species six occur in Michigan.

KEY TO THE MICHIGAN SPECIES OF ERIOPHORUM

- A. Inflorescence of a single terminal spikelet without a leafy involucre.
 - 1. E. spissum.
- A. Inflorescence of two or more terminal spikelets with one to several leafy, involucre bracts.
 - B. Leaves triangular-channelled; one short, erect, involucre bract.
 - C. Uppermost leaf with blade shorter than the sheath.
 - 2. E. gracile.
 - C. Uppermost leaf with blade longer than the sheath.
 - 3. E. tenellum.
 - B. Leaves flat for at least half their length; two or more involucre bracts.
 - D. Scales green to black in color, with one prominent midrib; stamens usually three.
 - E. Midrib of scale not prominent at tip; summits of upper sheaths darkened.
 - 4. E. angustifolium.
 - E. Midrib of scale prominent to tip; summits of sheaths not darkened.
 - 5. E. viridi-carinatum.
 - D. Scales reddish in color, with several prominent ribs; stamen one.
 - 6. E. virginicum.

1. Eriophorum spissum Fern. Rhodora 27: 208. 1925.
Eriophorum vaginatum of earlier Michigan authors,
 not of L. 1753.
Eriophorum callitrix of many Michigan authors, not
 of Cham. 1831.

Found in bogs and swamps, especially, in the northern counties.

Specimens Examined: ALGER CO. S. A. Cain (1947) CIS 13849 BAY CO. G. M. Bradford (1895) MSC 21620 and (1895) MSC. BARAGA CO. C. D. Richards 1785 (1949) UM. CHEBOYGAN CO. J. H. Enlers 2426 (1923) UM, 2490 (1923) UM, 3430 (1926) UM; S. A. Cain & F. Segadas Vianna (1948) CIS 11346. CHIPPEWA CO. C. K. Dodge (1914) UM. EMMET CO. J. H. Enlers 1057 (1920) MSC, 1057 (1920) UM. GOGEBIC CO. H. T. Darlington 3149 (1920) MSC. GRATIOT CO. C. A. Davis (1890) MSC 21635. INGHAM CO. Anon. (1872) MSC 21618; C. F. Wheeler (1891) MSC 21650; H. C. Skeels (1895) MSC 21660; J. Gross (1940) MSC. IRON CO. R. F. Collins LES 67 (1930) MSC. ISLE ROYALE A. E. Foote (1868) UM, C. A. Brown 3035 (1930) UM, 3195 (1930) UM; H. & V. Bailey 4110 (1942) UM, 4110 (1942) MSC. JACKSON CO. S. H. & D. R. Camp (1893) MSC 18563 KALAMAZOO CO. C. R. Hanes 4425 (1944) MSC. KEWEENAW CO. O. A. Farwell (1886) MSC 21613, 550 (1887) MSC, (1888) MSC 21615. MACOMB CO. D. D. Cooley (1843) MSC 21625; B. Barlow (1901) MSC 21622; M. H. Clark (1871) UM; M. T. Bingham (1940) CIS 9022. MENOMINEE CO. C. O. Grassl 2684 (1933) UM. OAKLAND CO. O. A. Farwell (1918) CIS 9682, (1918) UM, 4906 (1918) UM, 6896 (1924) UM; C. Billington (1918) CIS 1570, (1918) WMCE, M. T. Bingham (1936) CIS 1571. OSCODA CO. Anon. (1888) MSC 21621. OTTAWA CO. E. J. Cole (1899) MSC 21659. ROSCOMMON CO. F. J. Hermann 7005 (1935) UM. ST. CLAIR CO. C. K. Dodge 988 (1904) MSC, (1904) CIS 1569, (1904) UM. WASHTENAW CO. M. W. Harrington UM; J. H. Enlers 2261 (1923) UM; F. J. Hermann 6203 (1934) UM, 6796 (1935) MSC. WEST OF SAGINAW BAY G. H. Cannon (1849) MSC 21624.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates (112); E. Woollett (163), (163). CLINTON CO. W. J. Beal (46). GRATIOT CO. H. M. McGurdy (142). ISLE ROYALE W. S. Cooper (61); W. P. Holt (138). KENT CO. E. J. Cole (58). MARQUETTE CO. C. K. Dodge (83). MENOMINEE CO. E. J. Hill (135), (136). SCHOOLCRAFT CO. C. K. Dodge (86). TUSCOLA CO. C. K. Dodge (88).

Map 60.

2. Eriophorum gracile W.D.J. Koch, Cat. 2: 259. 1800.

A rare plant of bogs and marshes. Rather northern.

Specimens Examined: ALGER CO. C. K. Dodge (1916) UM.
CHIPPEWA CO. C. K. Dodge (1914) UM. GRAND TRAVERSE CO.
W. J. Beal & C. F. Wheeler (1888) MSC 21663. GRATIOT CO.
C. A. Davis (1894) UM. ISCO CO. W. J. Beal & C. F. Wheeler
(1888) MSC 21632. KALAMAZOO CO. C. R. Hanes 7533 (1933) MSC.
KEWEENAW CO. Anon. (1883) UM; O. A. Farwell (1886) MSC 21634.
MUSKEGON CO. C. D. McLouth (1899) MSC 21648. ST. CLAIR CO.
C. K. Dodge (1896) UM. WASHTENAW CO. Anon. (1838) UM; Anon.
(1866) UM, (1866) UM; H. Hill UM.

Unconfirmed Reports: CLINTON CO. W. J. Beal (46).
GENESEE CO. W. J. Beal (46). ISLE ROYALE, C. A. Brown (52);
W. P. Holt (138). KALAMAZOO CO. W. J. Beal (46). KENT CO.
E. J. Cole (58). LAKE SUPERIOR LAND DISTRICT Foster & Whitney
(109). MARQUETTE CO. A. Pacnnowski (63); C. K. Dodge (83).
MONTCALM CO. W. J. Beal (46). OAKLAND CO. M. T. Bingham (51).
PRESQUE ISLE CO. C. K. Dodge (85). ST. JOSEPH CO. F. P. Daniels
(66). SCHOOLCRAFT CO. C. K. Dodge (86). WASHTENAW CO. B. A.
Walpole (156); L. H. Weld (157).

Map 61.

3. Eriophorum tenellum Nutt. Gen. Am. 2. 1818.
Eriophorum gracile Koch, var. paucinervium Engelm.
Amer. Journ. Sci. 46: 103. 1844.

Found in bogs usually in our northern counties. Rare.

Specimens Examined: CHEBOYGAN CO. M. T. Pingham (1937)
CIS 1573. CHIPPEWA CO. C. K. Dodge (1914) UM. EMMET CO.
J. H. Enlers 1056 (1920) UM. GRATIOT CO. C. A. Davis (1894)
UM. ISLE ROYALE C. A. Brown 3667 (1930) UM. KEWEENAW CO.
O. A. Farwell 142 (1884) UM, (1887) MSNC. LUCE CO. C. K.
Dodge (1915) UM. MACOMB CO. D. D. Cooley (1843) MSC 21627.
MARQUETTE CO. Anon. (1892) MSC 61557. MISSAUKEE CO. E. A.
Bessey 607 (1916) MSC. SCHOOLCRAFT CO. J. H. Enlers 4300
(1929) UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates & J. H.
Enlers (113); D. Sigler & M. Woollett (153). ISLE ROYALE
W. S. Cooper (61). KALAMAZOO CO. C. R. Hanes (122), (124).
SCHOOLCRAFT CO. C. K. Dodge (86).

Map 62.

4. Eriophorum angustifolium Roth, Tent. 1: 24. 1788.
Eriophorum polystachyon of many Michigan authors,
not of L. 1753.
Eriophorum angustifolium var. majus Schultz, Fl.
Starg. Suppl. 5. 1819.

Found in wet bogs, swamps and along shores. Pretty much
of a northern plant like all other members of the genus.

Specimens Examined: ANTRIM CO. C. W. Bazuin 7264 (1947) MSC. BARRY CO. Anon. (1937) MSC. BAY CO. G. M. Bradford (1895) MSC. BEAVER ISLAND M. C. Ries (1932) CIS 1567. CASS CO. C. F. Wheeler (1890) MSC 94145. CHIPPEWA CO. N. A. Wood (1912) UM; C. K. Dodge (1914) UM. CRAWFORD CO. G. H. Hicks (1888) MSC 21636. DELTA CO. C. O. Grassl * 7944 (1934) UM. INGHAM CO. C. F. Wheeler (1900) MSC 21637. KENT CO. C. W. Bazuin (1937) CIS 12243. KEWEENAW CO. F. J. Hermann 7506 (1936) UM. MARQUETTE CO. B. Barlow (1901) MSC 21631. MENOMINEE CO. C. O. Grassl * 3015 (1933) UM. MUSKEGON CO. W. J. Beal (1898) MSC 21623. ST. CLAIR CO. C. K. Dodge (1891) UM, (1893) UM. SCHOOLCRAFT CO. C. K. Dodge (1915) UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates (110); F. C. Gates & J. H. Ehlers (113); D. Sigler & M. Woollett (153). CHIPPEWA CO. Mrs. E. Jansen (143). DICKENSON CO. C. K. Dodge (86). GOGEBIC CO. H. T. Darlington (68). KALAMAZOO CO. C. R. & F. N. Hanes (124). KEWEENAW CO. O. A. Farwell (96). MANISTEE CO. I. E. W. Olson (144). MARQUETTE CO. C. K. Dodge (83). MIDLAND CO. T. W. Crissey (143). OAKLAND CO. M. T. Bingham (51). SOUTHERN MICHIGAN J. Wright (165).

Map 63.

5. Eriophorum viridi-carinatum (Engelm.) Fern. Rhodora 7: 89. 1905.
Eriophorum polystachyon, in part, of many authors, not of L. 1753.
Eriophorum polystachyon var. latifolium Gray, Man. 529. 1848.
Eriophorum polystachyon var. viridi-carinatum (Engelm.) Farwell, Mich. Acad. Sci., Ann. Rep., 21: 361. 1919.

Found in bogs, wet and swampy meadows and woods. Found throughout most of the state in favorable habitats.

Specimens Examined: ALCONA CO. H. T. Darlington B&D 2187 (1918) MSC. ALGER CO. C. K. Dodge (1916) UM. BOIS BLANC ISLAND M. T. Bingham (1937) CIS 1584. CHEBOYGAN CO. F. C. Gates 112 (1911) MSC; J. H. Ehlers 387 (1917) UM, 964 (1920) UM, 964 (1920) MSC, 1507 (1921) UM; C. O. Erlanson 243 (1924) UM; T. H. P. Marshall 451 (1949) MSC. CHIPPEWA CO. D. Houghton (1831) UM; R. McVaugh 9176 (1948) UM, 9176 (1948) CIS. CLINTON CO. C. F. Wheeler (1890) MSC 21646. CRAWFORD CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11348. GRAND TRAVERSE CO. Anon. (1888) MSC 61545; C. W. Bazuin 8344 (1950) MSC. GRATIOT CO. C. A. Davis (1891) MSC 21639. HOUGHTON CO. F. J. Hermann 1564 (1927) UM. INGHAM CO. W. R. Kedzie (1895) MSC 21655. IOSCO CO. J. H. Ehlers 4778 (1931) UM. ISLE ROYALE University Party (1868) UM; C. A. Brown 3641 (1930) UM, 3278

(1930) UM; J. B. McFarlin 2097 (1930) UM. KALAMAZOO CO.
 C. R. Hanes 1003 (1933) MSC, 2888 (1938) MSC. KENT CO.
 E. J. Cole (1894) MSC 21658; G. Fyfe & J. Shaddick (1896)
 MSC 21656; C. W. Bazuin CIS 12242, 479 (1939) MSC. KEWEENAW
CO. O. A. Farwell (1886) MSC 6154 6; (1890) MSNC; 743 (1890)
 UM; C. D. Richards 712 (1948) UM, 1074 (1948) UM. LAPEER CO.
 C. Billington (1916) UM. LIVINGSTON CO. Anon. 2234 (1923)
 UM; D. M. Lynch (1947) MSC. MARQUETTE CO. B. Barlow (1901)
 MSC 21609; A. Dacnowski (1906) UM. MONTCALE CO. E. F. Smith
 22 (1879) UM; W. Lapaugh 84 (1949) MSC. OAKLAND CO. C. Bill-
 ington (1914) CIS 1572, (1915) CIS 1566, (1916) UM, (1919)
 WMC; O. A. Farwell 6964 (1924) UM; E. W. Erlanson 1645 (1926)
 UM, 1645 (1926) MSC; W. B. Tyrell (1928) CIS 1575; M. T.
 Bingham (1936) CIS 1581, (1936) CIS 1582, (1936) CIS 1583;
 M. C. Livingston (1949) MSC. OTTAWA CO. C. H. Kauffman (1910)
 UM; C. W. Bazuin 1319 (1940) MSC, 1319 (1940) CIS. ST. CLAIR
CO. C. K. Dodge (1891) UM, (1896) UM, 967 (1896) MSC.
VAN BUREN CO. H. S. Pepoon 833 (1906) MSC, 878 (1906) MSC.
WASHTENAW CO. Anon. (1866) UM; O. A. Farwell 7953 (1927) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125).
CHEBOYGAN CO. R. Dutro & E. Conoe (89); H. Coburn (57);
 L. Goe (119); E. Woollett (163), (164). CHIPPEWA CO. C. K.
 Dodge (87). GOGEBIC CO. H. T. Darlington (68). MACKINAC ISLAND
C. K. Dodge (82). MANISTEE CO. I. E. W. Olson (144).
MARQUETTE CO. C. K. Dodge (83). SCHOOLCRAFT CO. C. K. Dodge
 (86). TUSCOLA CO. C. K. Dodge (88). WASHTENAW CO. L. H.
 Pennington (146); E. N. Transeau (155); B. A. Walpole (156).
HURON CO. C. K. Dodge (80). ISLE ROYALE W. S. Cooper (61).

Map 64.

6. Eriophorum virginicum L. Sp. Pl. 53. 1753.
Eriophorum virginicum var. album A. Gray, Man. ed.
 5: 566. 1867.

Tawny Cotton-Grass. A plant of most of the bogs of Michigan, it is our most widespread species of Eriophorum.
 Var. album has whitish bristles.

Specimens Examined: ALGER CO. J. H. Enlers 4420 (1929)
 UM. ARENAC CO. C. F. Wheeler (1900) MSC 21602. BAY CO.
 G. M. Bradford (1895) MSC. BEAVER ISLAND M. C. Ries 916 (1932)
 CIS. BERRIEN CO. G. L. Ames (1867) UM; H. T. Darlington 1770
 (1917) MSC. CHARLEVOIX CO. E. A. Bessey 10 (1912) MSC, 10
 (1912) MSC. CHEBOYGAN CO. H. C. Beardslee (1890) MSC 21607;
 F. C. Gates 436 (1911) MSC, 436 (1911) MSC, J. H. Enlers 577
 (1917) UM, 799 (1918) UM, 1829 (1921) UM, 5154 (1932) UM;
 W. Katz (1939) CIS 10197; M. T. Bingham (1937) CIS 1574;
 S. A. Cain & F. Segadas Vianna (1948) CIS 11349 and 11347;
 T. H. P. Marshall 742 and 889 (1949) MSC. CHIPPEWA CO.
 C. K. Dodge (1914) UM; R. McVaugh 9777 (1948) UM, 9777 (1948)
 CIS; R. E. Dils (1949) MSC. DELTA CO. F. Segadas Vianna (1949) UM;

C. I. Gilly & G. W. Parmelee G&P 148 (1949) MSC, G&P 182 (1949) MSC. EMMET CO. J. H. Ehlers 1058 (1920) MSC, 1058, 1058 (1920) UM; 1677 (1921) UM. GOGEBIC CO. H. T. Darlington B&D 2565 (1919) MSC, B&D 2611 (1919) UM. GRATIOT CO. C. A. Davis (1895) CIS 10471. HOUGHTON CO. F. J. Hermann 1534 (1927) UM. INGHAM CO. C. F. Wheeler (1891) MSC 21608; G. D. Sones (1891) UM; Anon. (1892) MSC 61552; G. H. Hicks (1892) MSC; W. R. Kedzie (1895) MSC 21653; H. T. Darlington 709 (1916) MSC; P. A. Hyypio 180 (1950) MSC. JACKSON CO. Anon. (1838) UM; (1838) UM; (1838) UM. KENT CO. J. Snaddick & H. Skeels (1896) MSC 21654; C. W. Bazuin 479 (1939) MSC. KEWEENAW CO. O. A. Farwell (1900) UM. LUCE CO. C. K. Dodge (1915) CIS 1576. MACKINAC CO. J. H. Ehlers 4504 (1929) UM. MACOMB CO. D. D. Cooley (1838) MSC 21630. MARQUETTE CO. A. Dacnnowski (1906) UM; C. K. Dodge (1916) UM. MENOMINEE CO. C. O. Grassl * 2640 (1932) UM, 3, 2894 (1933) UM, 3, 2894 (1933). UM. MONTCALM CO. C. A. Davis (1895) UM, (1895) UM. NEWAYGO CO. C. W. Bazuin 3486 (1941) CIS. OAKLAND CO. O. A. Farwell 4400 (1916) UM, 5319 (1919) UM, 5319 (1923) UM, 5319 (1923) UM, 6831 (1923) UM, 7287 (1924) UM; C. Billington (1916) CIS 1577, (1917) UM, (1917) WMC; M. T. Bingham (1936) CIS 1579. OTTAWA CO. C. W. Bazuin 429 (1939) MSC, 1921 (1940) MSC. PRESQUE ISLE CO. F. Boynton (1947) GWP. ST. CLAIR CO. C. K. Dodge 987 (1904) MSC, (1904) CIS 1580, (1904) UM. SCHOOLCRAFT CO. J. H. Ehlers 4299 (1929) UM; T. H. P. Marshall 906 (1949) MSC. VAN BUREN CO. H. S. Pepoon 63 (1904) MSC, 580 (1905) MSC. WASHTENAW CO. Anon. UM; A. J. Pieters (1894) MSC 21611, (1894) UM; B. A. Walpole (1921) MSC 21596; F. G. Gustafson (1924) UM.

Unconfirmed Reports: BEAVER ISLAND H. T. Darlington (71). BERRIEN CO. P. E. Hebert (125). DICKENSON CO. C. A. Davis (75). CLINTON CO. W. J. Beal (46). GENESEE CO. W. J. Beal (46). IRON CO. C. A. Davis (75). KALAMAZOO CO. C. R. & F. N. Hanes (124). KENT CO. E. J. Cole (58). MARQUETTE CO. Mrs. G. D. Smith (143). OAKLAND CO. E. N. Transeau (155). SCHOOLCRAFT CO. C. K. Dodge (86). TUSCOLA CO. C. K. Dodge (88). WASHTENAW CO. L. H. Pennington (146); E. N. Transeau (155). WEXFORD CO. T. W. Nonenpreger (143).

Map 65.

9. *Fuirena* Rottb. Descr. et Ic. Pl. 70. 1773.

A small genus of some 20 species, most of them native to the warm-temperate and tropical regions. Only one species occurs in Michigan.

1. *Fuirena pumila* Torr. ex Spreng. Syst. 1: 237. 1825.

Fuirena squarrosa of most Michigan authors, not of Michx. 1803.

Fuirena squarrosa var. *pumila* Torr. Fl. U.S. 1: 68. 1824.

Occurs in wet meadows, marshes and shores. This is another element of the Atlantic Coastal flora that occurs in the southwest corner of Michigan.

Specimens Examined: CASS CO. Anon. (1838) - 3 specimens, UM. KALAMAZOO CO. L. A. Kenoyer (1930) WMC; C. R. Hanes (1934) UM, (1939) UM. KENT CO. C. W. Bazuin 680 (1939) MSC, 680 1939) CIS, 2752 (1940) MSC. COUNTY UNKNOWN 4 specimens, UM.

Unconfirmed Report: MACOMB CO. W. J. Beal (46).
Map 66.

10. *HEMICARPHA* Nees & Arn. Edinb. New Phil. Jour. 17: 263. 1834.

A small genus of the tropics and temperate regions, with about five or six species, one of which occurs in Michigan.

1. *Hemicarpha micrantha* (Vahl) Pax, in Engler & Prantl, Nat. Pflf. 2(2): 105. 1887.
Scirpus subsquarrosus Muhl. Gram. 39. 1817.
Hemicarpha subsquarrosus (Muhl.) Nees, in Mart. Fl. Bras. 2(1); 61. 1842.
Hemicarpha micrantha (Vahl) Britt. of many authors.

Found along lake shores, stream banks, and other muddy places. This is one of the plants restricted to the southwestern corner of Michigan, although it was once collected in Ingham County.

Specimens Examined: CASS CO. H. S. Pepoon 70 (1904) MSC, (1906) MSC; F. C. Gates 1295 (1906) UM. INGHAM CO. Anon. (1887) MSC 21680. KALAMAZOO CO. L. A. Kenoyer (1930) WMC; C. R. Hanes (1935) UM; Anon. (1838) 3 specimens, UM. KENT CO. E. J. Cole (1898) MSC 21685; C. W. Bazuin 698 (1939) MSC, 2116 (1940) MSC, 2126 (1940) MSC. LAKE CO. C. W. Bazuin 7027 (1946) MSC, 7027 (1946) CIS. MUSKEGON CO. C. D. McLouth (1901) MSC 21679 and 21682. COUNTY UNKNOWN Trout Lake, Anon. UM.

Unconfirmed Report: CLINTON CO. C. F. Wheeler (158).
Map 67.

11. *RHYNCHOSPORA* Vahl, Enum. 2: 229. 1806.

This genus has about 200 species. It has a wide distribution and is most abundant in the warmer regions. Six species are found in Michigan.

Key to the Michigan Species of Rhynchospora

- A. Plant stout; leaves broad, 0.3-2 cm. wide, summits of sheaths cartilaginous; style simple or barely cleft, persistent as a tubercle 1.7-2.2 cm. long, exceeding the scales.
 - 1. R. macrostachya.
- A. Plant slender; leaves filiform to flat and narrow, rarely over 8 mm. wide, summits of sheaths membranaceous; style deeply two-cleft, only the base persistent as a tubercle 0.2-2.6 mm. long, hidden by the scales.
 - B. Bristles downwardly barbed or smooth.
 - C. Scales white or whitish-brown; bristles 9-15, often villous at the base.
 - 2. R. alba.
 - C. Scales brown; bristles 6, not villous at the base.
 - D. Achenes smooth, lustrous, with conspicuous pale margin, pyriform, 1.3-1.8 mm. long.
 - 3. R. capitellata.
 - D. Achenes finely granulate to rugulose, inconspicuously margined, narrowly oblong-ovoid, 1.8-2.6 mm. long.
 - 4. R. capillacea.
 - B. Bristles upwardly barbed.
 - E. Loosely stoloniferous; achene smooth; tubercle greenish, slender; the longer bristles equalling the tubercle.
 - 5. R. fusca.
 - E. Tufted; achene transversely ridged to rugulose; tubercle short with a basal annulus; bristles shorter than the achene.
 - 6. R. globularis var. recognita.
- 1. Rhynchospora macrostachya Torr. ex Gray, in Ann. Lyc. N. Y. 3: 208. 1835.
 - Rhynchospora corniculata of many Michigan authors, not of (Lam.) A. Gray. 1835.
 - Rhynchospora corniculata var. macrostachya (Torr.) Britt. Tran. N. Y. Acad. Sci. 11: 84. 1892.

Horned Beak-Rush. This species is restricted in Michigan to the southwestern counties where it occurs locally on wet sands and bogs in shallow water. Peattie (145) names it as one of the members of the Atlantic Coastal Plain element in the flora of the Lake States.

Specimens Examined: ALLEGAN CO. D. L. Allen (1937) MSC; C. W. Bazuin 4984 (1942) MSC. KALAMAZOO CO. L. A. Kenoyer (1931) WMC; C. R. Hanes 6247 (1947) MSC. KENT CO. C. W. Bazuin 23 (1938) MSC, 155 (1938) MSC, 4007 (1941) MSC.

MUSKEGON CO. C. D. McLouth (1899) MSC; C. W. Bazuin 6736 (1945) CIS, 6736 (1945) MSC. NEWAYGO CO. C. W. Bazuin 3637 (1941) MSC. VAN BUREN CO. H. S. Pepoon (1905) MSC 21718; F. C. Gates 1461 (1906) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). KENT CO. E. J. Cole (58).

Map 68.

2. Rhynchospora alba (L.) Vanl, Enum. 2: 236. 1806.

Schoenus albus L. Sp. Pl. 44. 1753.

Rhynchospora alba var. macra Clarke, Britt. Trans. N. Y. Acad. Sci. 9:88. 1892.

Triodon albus (Lin.) Farwell, Mich. Acad. Sci., 19: 252. 1917

Triodon albus var. macer (Clarke) Farwell, l. c.

Phaeocephalum album (L.) Farwell, Mich. Acad. Sci., 21: 361. 1919.

Phaeocephalum album var. marcum (Clarke) Farwell, l.c.

White Beak-Rush. This is the most widespread member of the genus in our state. Frequent in open sphagnum bogs, in openings and along edges of cedar and larch-spruce swamps.

Specimens Examined: ALGER CO. F. J. Hermann 6396 (1934) UM. BEAVER ISLAND C. F. Wheeler 215 (1900) MSC; M. C. Ries 914 (1932) CIS. BOIS BLANC ISLAND M. T. Bingham (1939) CIS 1587. CASS CO. F. C. Gates 1350 (1906) UM. CHEBOYGAN CO. J. H. Enlers 578 (1917) UM, 800 (1918) UM, 1831 (1921) UM, 6120 (1936) UM; T. H. P. Marshall 888 (1949) MSC; M. C. Ries 914 (1932) CIS. CHIPPEWA CO. R. McVaugh 9738 (1948) UM. DELTA CO. R. McVaugh 10946 (1949) UM. EMMET CO. C. W. Fallass (1898) MSC 21697; J. H. Enlers 1656 (1921) UM, 5332 (1933) UM. GOGEBIC CO. H. T. Darlington B&D 2610 (1919) MSC. ISLE ROYALE C. A. Brown 3291 (1930) UM; J. B. McFarlin 2263 (1930) UM. JACKSON CO. Anon. (1838) UM, Anon. (1838) UM. KALAMAZOO CO. Anon. (1838) UM; L. A. Kenoyer (1930) WMC; C. R. Hanes (1934) UM. KENT CO. C. W. Bazuin 683 (1939) MSC, 1783 (1940) MSC, (1939) CIS 12240. KEWEENAW CO. O. A. Farwell (1888) MSC 94010; F. J. Hermann 8204 (1936) UM. LAKE CO. C. W. Bazuin 7836 (1948) CIS. MACKINAC CO. C. F. Wheeler (1890) MSC 94008. MARQUETTE CO. A. Dachnowski (1906) UM, (1906) UM. MISSAUKEE CO. E. A. Bessey 710 (1916) MSC. MONTCALM CO. C. A. Davis (1893) MSC 94005; C. A. Davis (1900) UM. NEWAYGO CO. H. T. Darlington 975 (1916) MSC. OAKLAND CO. G. H. Hicks (1892) MSC 94000; C. Billington (1916) CIS 1592, (1916) UM, (1919) WMC; O. A. Farwell 4374 (1916) UM, 4379 (1916) UM, 4399a (1919) UM, 5313 (1919) UM, (1919) UM. OTTAWA CO. C. H. Kauffman (1910) UM. PRESQUE ISLE CO. N. W. Katz (1939) CIS 10234; F. Boynton (1947) GWP. ST. CLAIR CO. C. K. Dodge 984 (1899) MSC, (1899) UM. SCHOOLCRAFT CO.

C. A. Davis (1905) UM; L. K. Ludwig 1532 (1941) UM.
VAN BUREN CO. n. S. Pepoon 15 (1904) MSC. WASHTENAW CO.
 A. J. Pieters 10 (1894) MSC 94006, (1894) UM; B. A. Walpole
 (1919) MSC 21693; M. W. Harrington UM; Anon. UM.

Unconfirmed Reports: BEAVER ISLAND H. T. Darlington
 (71). BERRIEN CO. P. E. Hebert (125). CHEBOYGAN CO. F. C.
 Gates (110). CHIPPEWA CO. C. K. Dodge (87). CLINTON CO.
 W. J. Beal (46). DICKENSON CO. C. A. Davis (75). HURON CO.
 C. K. Dodge (80). GRATIOT CO. W. J. Beal (46). ISLE ROYALE
 W. P. Holt (138); W. S. Cooper (61). JACKSON CO. G. N. Hicks
 (133). KENT CO. E. J. Cole (58). MANISTEE CO. I. E. W. Olson
 (144). MARQUETTE CO. C. K. Dodge. MINNOMINEE CO. C. A. Davis
 (75). OAKLAND CO. M. T. Bingham (51). MACOMB CO. W. J. Beal
 (46). ST. JOSEPH CO. F. P. Daniels (66). SCHOOLCRAFT CO.
 C. K. Dodge (86). TUSCOLA CO. C. K. Dodge (88).

Map 69.

3. Rhynchospora capitellata (Michx.) Vanl., Enum.

2: 235. 1806.

Scoenus capitellatus, in part, of Michx. Fl.

Bor.-Am. 1: 36. 1803.

Rhynchospora glomerata of many Michigan authors,
 not of (L.) Vanl., 1806.

Rhynchospora glomerata var. minor Britt. Trans.
 N. Y. Acad. Sci. 11: 89. 1892.

Triodon glomerata (L.) Farwell, Mich. Acad. Sci.
 Ann. Rep. 15: 167. 1913.

Phaeocephalum glomeratum (L.) var. minus (Britt.)
 Farwell, Mich. Acad. Sci., Ann. Rep. 21: 361. 1919.

Clustered Beak-Rush. Found on lakeshores, along river-
 banks and low boggy places.

Specimens examined: BERRIEN CO. H. T. Darlington 1631
 (1916) MSC, 1636½ (1917) MSC. C. Billington (1917) UM.
CALHOUN CO. W. J. Beal (1898) MSC 21734. CLINTON CO. C. F.
 Wheeler (1884) UM. INGHAM CO. Anon. (1891) MSC 21728; C. F.
 Wheeler (1891) MSC 21726. JACKSON CO. G. H. Hicks (1893)
 MSC 21713, (1893) MSC 21724, (1893) CIS 14129; S. H. &
 D. R. Camp (1893) MSC 21726. KALAMAZOO CO. C. R. Hanes (1934)
 UM, (1935) UM. KENT CO. E. J. Cole (1897) UM; C. W. Bazuin
 5 (1938) MSC, 16 (1938) MSC, 156 (1939) MSC, 2010 (1940)
 MSC. LAKE CO. C. W. Bazuin 7645 (1948) CIS. MONTCALM CO.
 C. A. Davis (1896) UM, (1896) UM. MUSKEGON CO. C. D. McLouth
 (1898) MSC 21731, (1899) MSC 21723; C. W. Bazuin 5865 (1943)
 CIS. OAKLAND CO. C. Billington (1920) WMC; O. A. Farwell 5581
 (1920) UM, 5581 (1920) UM. OTTAWA CO. C. H. Kauffman (1910) UM,
 (1910) UM; C. W. Bazuin 5011 (1942) CIS. ST. CLAIR CO. C. K.
 Dodge (1896) MSC 21733, 1001 (1897) MSC, (1897) CIS 1598,
 (1897) UM. VAN BUREN CO. D. Houghton (1838) UM; Anon. (1838) UM;

(1838) UM; (1838) UM; (1838) UM; (1838) UM; H. S. Pepoon 58 (1904) MSC. WASHTENAW CO. B. A. Walpole (1918) UM; F. J. Hermann 9247 (1937) UM; C. O. Grassl * 7940 UM. WAYNE CO. Anon. UM; O. A. Farwell 1806a (1903) UM; C. Billington (1916) CIS 1596, (1916) UM.

Unconfirmed Reports: KEWEENAW CO. W. J. Beal (46); O. A. Farwell (96). MACOMB CO. W. J. Beal (46). OAKLAND CO. M. T. Bingham (51). ST. JOSEPH CO. F. P. Daniels (66). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88). WASHTENAW CO. O. A. Farwell (96). SOUTHERN MICHIGAN J. Wright (165).

Map 70.

4. Rhynchospora capillacea Torr. Comp. 41. 1826.
Triodon capillacea (Torr.) Farwell, Mich. Acad. Sci., Ann. rep. 15: 167. 1913.
Phaeocephalum capillaceum (Torr.) Farwell, l. c., 21: 361. 1919.

Capillary Beak-Rush. A species of bogs. The forms *leviseta*, which is treated separately, has smooth bristles but is otherwise identical to the species and occurs in the same habitats and has about the same distributional pattern.

Specimens Examined: BOIS BLANC ISLAND M. T. Bingham (1939) CIS 1595. CASS CO. H. S. Pepoon 259 (1904) MSC, 650 (1905) MSC. CHARLEVOIX CO. C. F. Wheeler (1879) MSC 21716, (1894) CIS 14105. CHEBOYGAN CO. J. H. Enlers 7114 (1938) UM. EMMET CO. C. F. Wheeler 12 (1890) MSC, (1890) MSC 21715, (1879) UM. JACKSON CO. F. J. Hermann 9309 (1937) UM. KALAMAZOO CO. L. H. Kenoyer (1930) WMC; C. R. Hanes 3437 (1937) MSC. KENT CO. E. J. Cole (1896) MSC 21711; C. W. Bazuin 157 (1939) MSC, 1655 (1940) MSC. MACKINAC CO. S. A. Cain & F. Segadas Vianna (1948) CIS 11508. MACOMB CO. D. D. Cooley (1843) MSC 21704. OAKLAND CO. G. H. Hicks (1892) MSC 21700, (1892) MSC 21708; O. A. Farwell 4366 (1916) UM, 5378 (1919) UM; B. A. Walpole (1920) MSC 21710; S. A. Cain & F. Segadas Vianna (1948) CIS 12654. OSCODA CO. H. T. Darlington B&D 2345 (1918) MSC. ST. CLAIR CO. C. K. Dodge (1892) UM. WASHTENAW CO. C. Billington (1948) WMC; F. J. Hermann 6433 (1934) UM.

Unconfirmed Reports: BEAVER ISLAND H. T. Darlington (71). BERRIEN CO. P. E. Hebert (125). CLINTON CO. W. J. Beal (46). GENESEE CO. W. J. Beal (46). HURON CO. C. K. Dodge (80). JACKSON CO. W. J. Beal (46). MACKINAC ISLAND C. K. Dodge (82). MARQUETTE CO. A. Dachnowski (63). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88). WASHTENAW CO. B. A. Walpole (156).

Map 71.

- 4a. Rhynchospora capillacea forma leviseta (E. J. Hill)
 Fern. Knodora 37: 252. 1935.
Rhynchospora capillacea var. leviseta E. J. Hill,
 Am. Nat. 10: 370. 1876.
Phaeocephalum capillaceum var. levisetum (E. J. Hill)
 Farwell, Mich. Acad. Sci., Ann. Rep. 21: 361. 1919.

The smooth-bristled form, which is otherwise identical to the typical species in morphology and distribution. Judging from the number of specimens examined it seems to be more numerous than R. capillacea in our state.

Specimens Examined: BOIS BLANC ISLAND M. T. Bingham (1938) CIS 1593. CHARLEVOIX CO. Anon. (1892) MSC 21707; C. F. Wheeler (1892) MSC 21713, (1892) UM; Anon. (1894) UM; R. McVaugh 10847 (1949) UM. CHEBOYGAN CO. C. K. Dodge (1913) UM; J. H. Ehlers 4591 (1929) UM, 7114.5 (1938) UM; T. H. P. Marshall 576 (1949) MSC. EMMET CO. J. H. Ehlers 2094 (1922) UM, 2094 (1922) UM, 2646 (1923) UM, 7074 (1938) UM; R. McVaugh 9493 (1948) UM; C. L. Gilly & G. W. Parmelee G&P 122 (1949) MSC. JACKSON CO. S. H. & D. R. Camp (1893) MSC 21701. KALAMAZOO CO. C. R. Hanes (1934) UM. KENT CO. A. J. Pieters (1897) UM; C. W. Bazuin 1794 (1940) MSC, 1794 (1940) CIS. MACKINAC CO. C. K. Dodge (1912) UM; J. H. Ehlers 1392 (1920) UM, 1392 (1920) UM, 1838 (1921) UM; J. H. & L. S. Ehlers 1392 (1920) MSC; R. McVaugh 11089 (1949) UM, 11089 (1949) CIS. MACOMB CO. D. D. Cooley (1837) MSC 21705. OAKLAND CO. C. Billington (1916) CIS 1594, (1916) UM, (1916) UM; O. A. Farwell 199-31 (1895) UM. PRESQUE ISLE CO. W. Katz (1939) CIS 10235; T. H. P. Marshall 778 (1949) MSC; R. McVaugh 10912 (1949) UM. SCHOOLCRAFT CO. J. H. Ehlers 4375 (1929) UM; R. McVaugh 10982 (1949) UM. TUSCOLA CO. C. A. Davis (1897) MSC 21712, (1901) CIS 10608, (1901) UM, (1902) UM.

Unconfirmed Reports: ANTRIM CO. W. J. Beal (46). KENT CO. E. J. Cole (58). OAKLAND CO. W. J. Beal (46). SAGINAW CO. W. J. Beal (46). ST. CLAIR CO. C. K. Dodge (79).

Map 72.

5. Rhynchospora fusca (L.) Ait. f. Hort. Kew. ed.
 2: 1. 127. 1810.
Schoenus fuscus L. Sp. Pl. Ed. 2. 1664. 1753.
Phaeocephalum fuscum (L.) Farwell, Mich. Acad. Sci.
 Ann. Rep. 21: 361. 1919.

A plant of peat bogs and sandy or peaty shores. More common in the northern counties and in the Upper Peninsula.

Specimens Examined: ALCONA CO. H. T. Darlington B&D 2262 (1918) MSC. ALLEGAN CO. C. W. Bazuin 7874 (1948) CIS. ALPENA CO. C. J. Wheeler (1895) MSC 21720. CHEBOYGAN CO. J. H. Ehlers 6128 (1936) UM. CHIPPEWA CO. R. McVaugh 9736 (1948) CIS, 9736 (1948) UM. HURON CO. C. K. Dodge (1908) UM.

ISLE ROYALE H. & V. Bailey 4315 (1942) MSC. KALAMAZOO CO.
C. R. Hanes (1938) WMC. MARQUETTE CO. A. Dacnowski (1906)
UM. SCHOOLCRAFT CO. C. A. Davis (1905) UM; J. H. Enlers
4297 (1929) UM; L. K. Ludwig 1151 (1941) UM.

Unconfirmed Reports: CHARLEVOIX CO. W. L. McAtee (140).
CHEBOYGAN CO. F. C. Gates (112). DELTA CO. W. J. Beal (46).
SCHOOLCRAFT CO. C. K. Dodge (86).

Map 73.

6. Rhynchospora globularis (Chapm.) Small var. recognita
Gale, Rhodora 46: 245. 1944.
Schoenus cymosus Muhl. Gram. 8. 1817.
Rhynchospora cymosa sensu Torr. and later auth.,
not Ell. 1816.
Phaeocephalum cymosum (Ell.) Farwell, Mich. Acad.
Sci., Ann. Rep. 21: 361. 1919.

Mentioned as growing in prairie bogs near Sturgis,
Michigan, by the collector of the only specimen seen by the
present author. It should be interesting to know whether
it is still growing there.

Specimen Examined: ST. JOSEPH CO. Sturgis, Mich.
F. P. Daniels (1898) MSC 21719.

Unconfirmed Reports: It has never been reported by
anyone else as occurring in Michigan.

Map 74.

SPECIES OF RHYNCHOSPORA DOUBTFULLY OR ERRONEOUSLY REPORTED FOR MICHIGAN

Rhynchospora corniculata (Lam.) Gray. This species has
often been reported as occurring in Michigan but the reports
refer to R. macrostachya, which has often been misidentified
and called R. corniculata.

Rhynchospora glomerata (L.) Vahl. Reports for this
species refer to R. capitellata (Michx.) Vahl. R. glomerata
occurs considerably south of Michigan.

12. CLADIUM P. Br. Civ. & Nat. Hist. Jan. 114. 1756.

A small genus of some thirty species, native to the
tropics and temperate regions. One species occurs in Michigan.

1. Cladium mariscoides (Muhl.) Torr. Ann. Lyc. N. Y.
3: 372. 1836.
? Cyperus mariscoides of J. Wright (165).
Mariscus mariscoides (Muhl.) Kuntze, Rev. Gen. Pl.
755. 1891.

Twig-Rush. A plant of marshes, swamps, bogs, lake shores, and other low, wet places. Widespread in Michigan.

Specimens Examined: ALCONA CO. H. T. Darlington B&D 2184 (1918) MSC. ALLEGAN CO. F. M. Stuewer (1937) MSC. C. W. Bazuin 7880 (1948) CIS. ALPENA CO. H. T. Darlington B&D 2026 (1918) MSC, B&D 2035 (1918) MSC. BAY CO. W. J. Beal & C. F. Wheeler (1888) MSC 21261; G. M. Bradford (1898) MSC. BEAVER ISLAND M. C. Ries 942 (1932) CIS. BOIS BLANC ISLAND M. T. Bingham (1938) CIS 1494 and 1495. CASS CO. H. S. Pepoon 160 (1904) MSC. CHEBOYGAN CO. F. C. Gates 213 (1911) MSC; W. Katz (1939) CIS 10213; J. H. Ehlers 4592 (1929) UM, 2719 (1923) UM. CHARITY ISLANDS C. A. Davis (1896) MSC 21251, 21247 and 21242, C. A. Davis - 4 specimens, UM; C. K. Dodge (1910) UM. CLINTON CO. C. F. Wheeler (1890) MSC 21258 and 21259. EMMET CO. T. H. P. Marshall 549 (1949) MSC; R. McVaugh 9479 (1948) UM; J. H. Ehlers 855 (1919) UM. INGHAM CO. Anon. (1888) MSC 21261; C. Billington (1924) WMC, (1924) UM. JACKSON CO. S. H. & D. R. Camp (1893) MSC 21265. KALAMAZOO CO. D. Houghton (1838) UM; Anon. (1838) 3 specimens, UM. KENT CO. E. J. Cole (1898) MSC 21266; C. W. Bazuin 2101 (1940) MSC, 67 (1939) MSC, 6 (1938) MSC, 3589 (1940) CIS, (1937) CIS 12241. LENAWEE CO. W. J. Beal (1867) MSC 21257. LIVINGSTON CO. J. H. Ehlers 4996 (1931) UM, 5530 (1933) UM. MACKINAC CO. C. F. Wheeler (1890) MSC 21256; J. H. Ehlers 1408 (1920) MSC, 1408 (1920) UM; C. L. Gilly & G. W. Parmelee G&P 130 (1949) MSC. MACOMB CO. D. D. Cooley (1847) MSC 21254. MARQUETTE CO. A. Dacanowski (1906) UM. MISSAUKEE CO. H. T. Darlington 584 (1916) MSC. MONTCALM CO. C. F. Wheeler 328 (1900) MSC; B. Barlow (1900) MSC 21262. OAKLAND CO. G. H. Hicks (1892) MSC 21241; O. A. Farwell 4303 (1916) UM, 4364 (1916) UM, 5048 (1918) UM, 5709½ (1920) UM; C. Billington (1916) UM, (1916) CIS 1492, (1920) WMC; M. T. Bingham (1935) CIS 1491, (1936) CIS 1597; S. A. Cain & F. Segadas Vianna (1948) CIS 12643 and 11317. ONTONAGON CO. H. T. Darlington & E. A. Bessey (1923) MSC 21246. OTTAWA CO. C. H. Kauffman (1910) UM; C. W. Bazuin 1863 (1940) MSC. PRESQUE ISLE CO. T. H. P. Marshall 780 (1949) MSC; F. Boynton (1947) GWP; R. McVaugh 10910 and 11046 (1949) UM; J. H. Ehlers 5671 (1934) UM. ST. CLAIR CO. C. K. Dodge (1892) MSC 21250, (1899) MSC 21239, (1892) MSC, (1899) CIS 1493, (1899) UM. WASHTENAW CO. F. G. Gustafson (1924) UM; O. A. Farwell 6779 (1923) UM. COUNTY UNKNOWN UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). CHIPPEWA CO. C. K. Dodge (87). GENESEE CO. W. J. Beal (46). HOUGHTON CO. O. A. Farwell (107). HURON CO. C. A. Davis (74); C. K. Dodge (80). ISLE ROYALE C. A. Brown (52); W. S. Cooper (61). KALAMAZOO CO. C. R. Hanes (123), (124). MACKINAC ISLAND C. K. Dodge (82). MANISTEE CO. F. P. Daniels (65). MENOMINEE CO. C. A. Davis (75). SCHOOLCRAFT CO. C. K. Dodge (86). TUSCOLA CO. C. A. Davis (77); C. K. Dodge (88).

13. SCLERIA Bergius, Kongl. Acad. Sv. Handl. 26: 142. 1765.

A rather large genus with about 200 species, most of them found in the tropics. Three species have been found in Michigan. They are characterized by their hard, white, shiny achenes.

Key to the Michigan Species of Scleria.

- A. Flower clusters terminal and in the upper axils; achenes with a basal disk (hypogynium).
 - B. Achenes smooth, hypogynium granular-roughened.
 - 1. S. triglomerata.
 - B. Achenes transversely papillose, hypogynium 3-angled, bearing 6 or 9 small tubercles.
 - 2. S. pauciflora.
- A. Flower clusters in an interrupted spike; achenes lacking a hypogynium; achenes transversely wrinkled and roughened.
 - 3. S. verticillata.

1. Scleria triglomerata Michx. Fl. Bor.-Amer. 2: 168. 1803.

Tall Nut-Rush. Found in dry to damp openings and thin woods.

Specimens Examined: KALAMAZOO CO. C. R. Hanes (1935) UM. OAKLAND CO. B. A. Walpole (1920) MSC 21921; C. Billington (1920) WMC, (1920) CIS 1676, (1920) UM. MACOMB CO. D. D. Cooley (1839) MSC 21931. MONROE CO. O. A. Farwell 8083 (1927) 2 specimens, UM, 5913 (1921) UM. ST. CLAIR CO. C. K. Dodge 996 (1904) MSC, (1904) UM. ST. JOSEPH CO. F. P. Daniels MSC 93836. WASHTENAW CO. D. Houghton (1838) UM; Anon. (1838) 2 specimens, UM; O. A. Farwell 5824 (1921) UM.

Unconfirmed Reports: BERRIEN CO. P. E. Hebert (125). GENESEE CO. W. J. Beal (46). OAKLAND CO. M. T. Pingnam (51). WASHTENAW CO. B. A. Walpole (156).

Map 76.

2. Scleria pauciflora Muhl.; Willd. Sp. Pl. 4: 318. 1806.

Scleria caroliniana Willd. Sp. Pl. 4: 318. 1805.

Scleria pauciflora var. caroliniana (Willd.) Wood, Bot. & Flora 368. 1871.

Few-flowered Whip-Grass. Found in dry to moist barrens.

Specimens Examined: OAKLAND CO. C. Billington (1920) WMC, (1920) CIS 1679, (1920) UM; O. A. Farwell 5579 (1920) UM. ST. CLAIR CO. W. S. Cooper 207 (1903) MSC. VAN BUREN CO. H. S. Pepoon 92 (1904) MSC.

Unconfirmed Reports: OAKLAND CO. M. T. Pingnam (51). WAYNE CO. O. A. Farwell (98).

Map 77.

3. Scleria verticillata Muhl. ex Willd. Sp. Pl. 4: 317. 1805.

Low Nut-Rush. Found in wet sandy soils, sometimes along edges of bogs.

Specimens Examined: ALGER CO. O. A. Farwell 7204 (1924) UM. EMMET CO. J. H. Ehlers 7076 (1938) UM. JACKSON CO. C. F. Wheeler (1892) MSC 21292, (1892) MSNC; S. H. & D. R. Camp (1893) MSC 21922, (1893) UM; F. J. Hermann 9311 (1937) UM. KALAMAZOO CO. C. R. Hanes 3017 (1937) MSC. KENT CO. E. J. Cole (1899) MSC 21930. LAPPEER CO. C. K. Dodge (1916) UM. MACOMB CO. D. D. Cooley (1842) MSC 21934. OAKLAND CO. G. H. Hicks (1892) MSC 21923 and 21924; C. Billington (1916) WMC, (1916) CIS 1677, (1916) UM; S. A. Cain & F. Segadas Vianna (1948) CIS 12655. PRESQUE ISLE CO. R. McVaugh 10903 (1949) UM, 10903 (1949) CIS; T. H. P. Marshall 664 (1949) MSC. ST. CLAIR CO. C. K. Dodge (1899) UM. TUSCOLA CO. C. A. Davis (1902) UM. WASHTENAW CO. F. J. Hermann 9323 (1937) UM.

Unconfirmed Reports: CHEBOYGAN CO. F. C. Gates & J. H. Ehlers (116). HURON CO. W. J. Beal (46). OAKLAND CO. M. T. Bingham (51); O. A. Farwell (91), (95). SOUTHWESTERN MICHIGAN H. S. Pepon (147).

Map 78.

Species of Scleria Doubtfully Reported for Michigan

Scleria Lindleyana Clarke. This species is described by E. L. Core (10) as being found in wet soil from Brazil to Guiana, a distribution that would hardly account for its presence in the United States, or much less, in Michigan. However, the University of Michigan has a specimen of it bearing the label; "Juncus acuminatus Mx. July 28, 1838, Kalamazoo, (Small Lakes)". The name has been changed, later, to J. effusus and still later to Scleria verticillata. The specimen has been examined by E. L. Core, who simply wrote "Not" in front of Scleria verticillata. It keys with ease into Scleria Lindleyana in Core's monograph on the genus, and there is no doubt in the writer's mind that it is that particular species. The real question is whether an unfortunate mixup somewhere along the line during the last 113 years has not occurred, in which the original specimen was lost and its accompanying label became attached to the present specimen. This writer cannot honestly believe that the specimen was collected in Michigan.

SUMMARY

This taxonomic study of the thirteen genera of Cyperaceae, exclusive of Carex, is the first to be made since 1904, when W. J. Reel's "Michigan Flora" was published.

It involved the study of all mounted specimens of cyperaceous plants in the herbaria of Michigan State College, the University of Michigan, Western Michigan College, Michigan State Normal College, Cranbrook Institute of Science, and the private herbarium of G. W. Prescott of East Lansing, Michigan.

Thirteen genera composed of 78 species, varieties, and forms were found to occur definitely in Michigan. Keys to the identification of the genera and species are included in this report. After each species, notes on habitat are given. The counties in which the specimens were collected are listed, along with information on the collectors, collector's number, year of collection, present location of each specimen, and, in some instances, the herbarium numbers of the specimens. The nomenclature has been brought up-to-date as nearly as was possible. A list of synonyms used by Michigan workers is included for each species which has been designated by other binomials than the presently accepted one.

A few notes on types of habitat are included in the beginning of the report. Maps showing distribution by counties have been prepared for each species. An analysis

of distributional patterns has been made. Five important and clearly defined patterns were discovered for the Michigan Cyperaceae. They are the southern, the southwestern, the southeastern, the northern and the general distributional patterns. The species important to each region are discussed.

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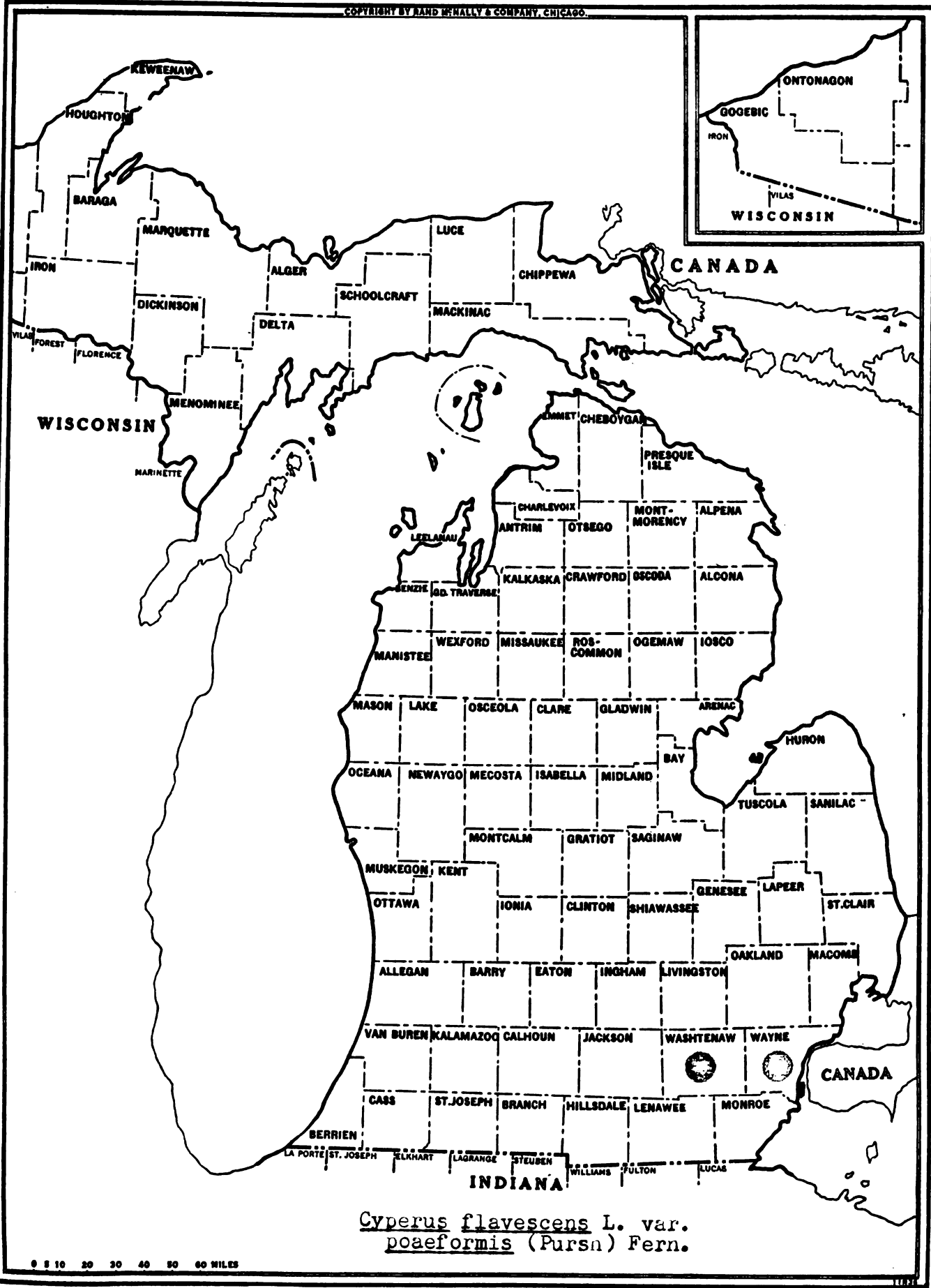
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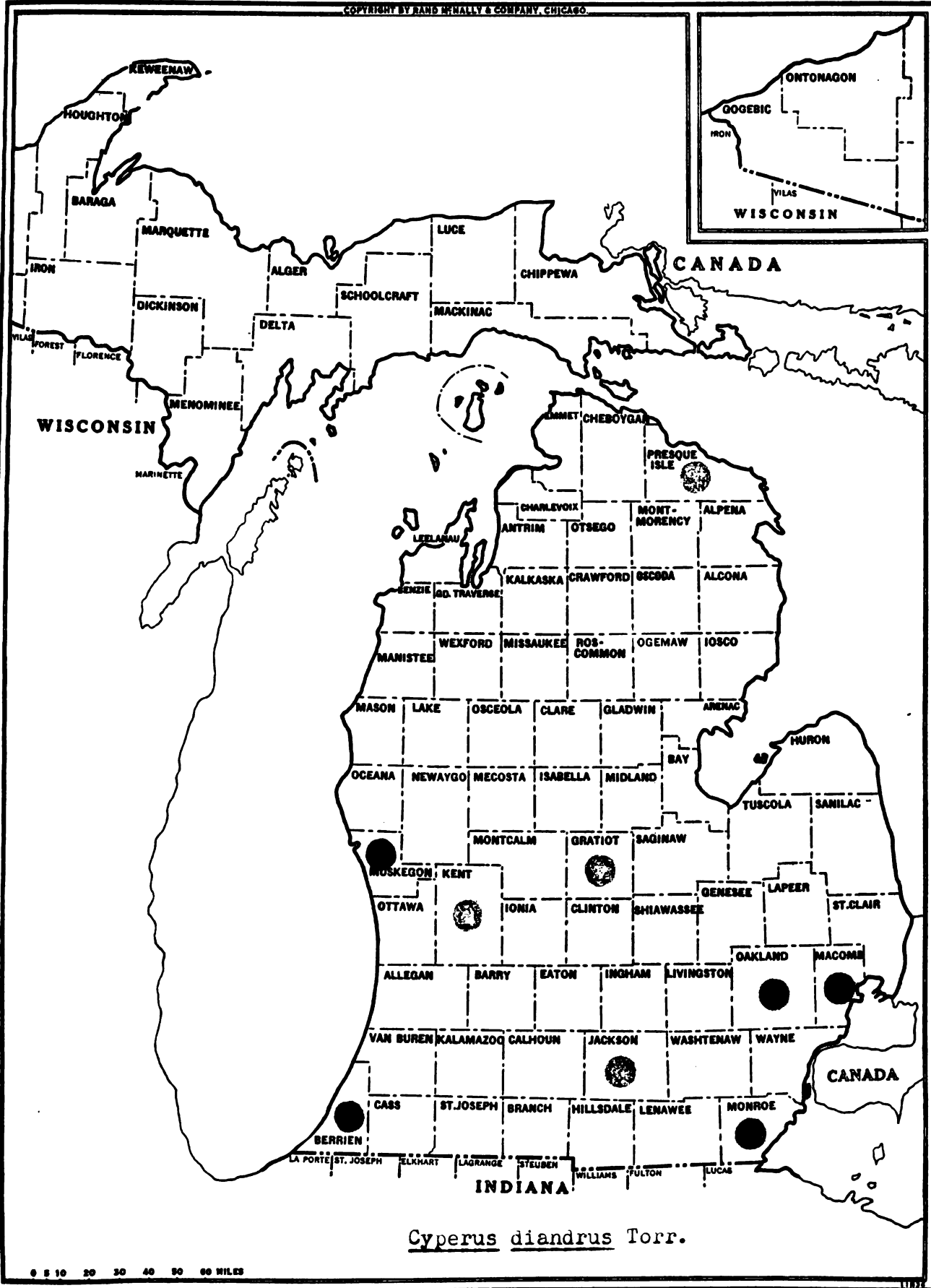
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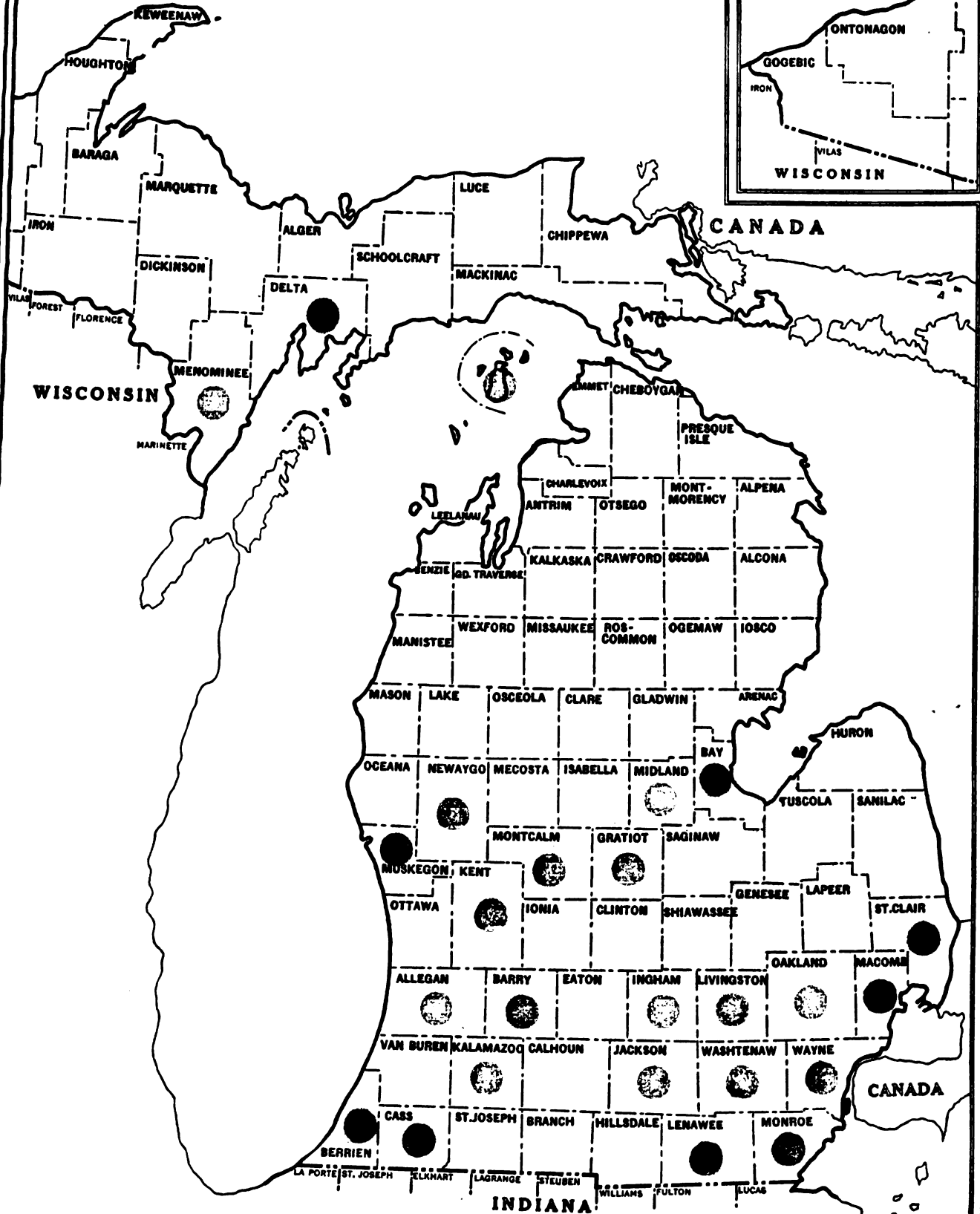


Cyperus flavescens L. var.
poaeiformis (Pursn) Fern.

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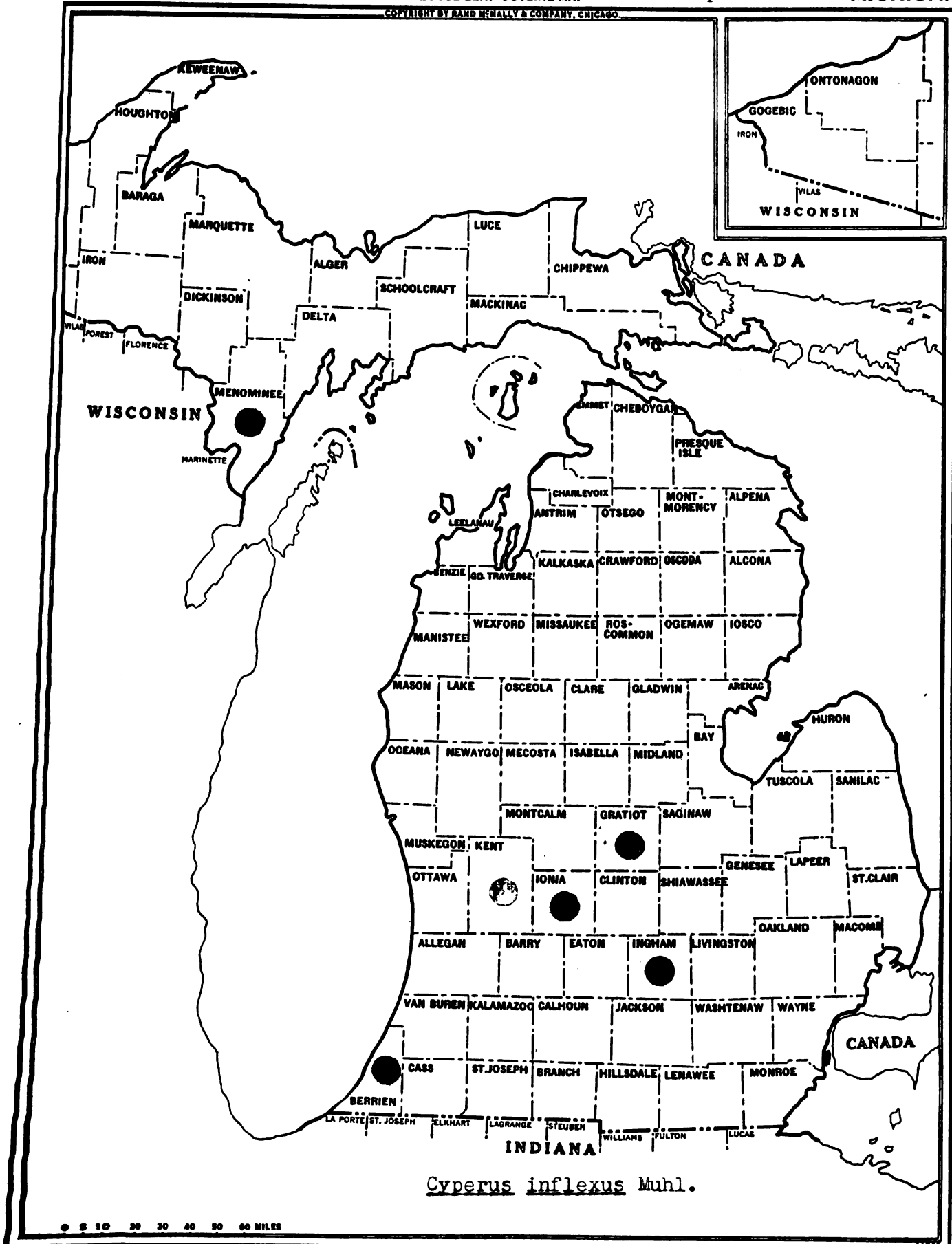
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Cyperus rivularis Kunth

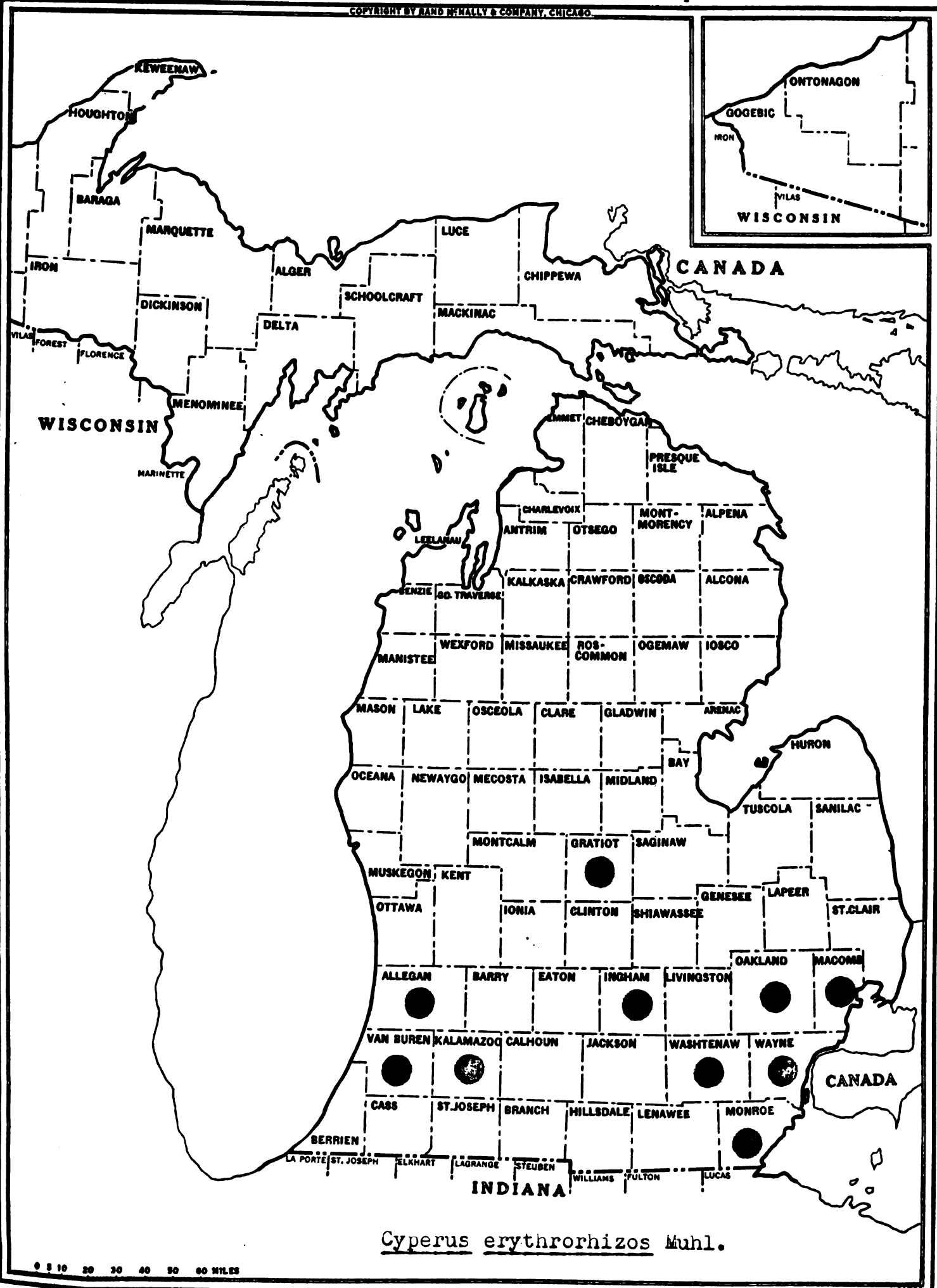
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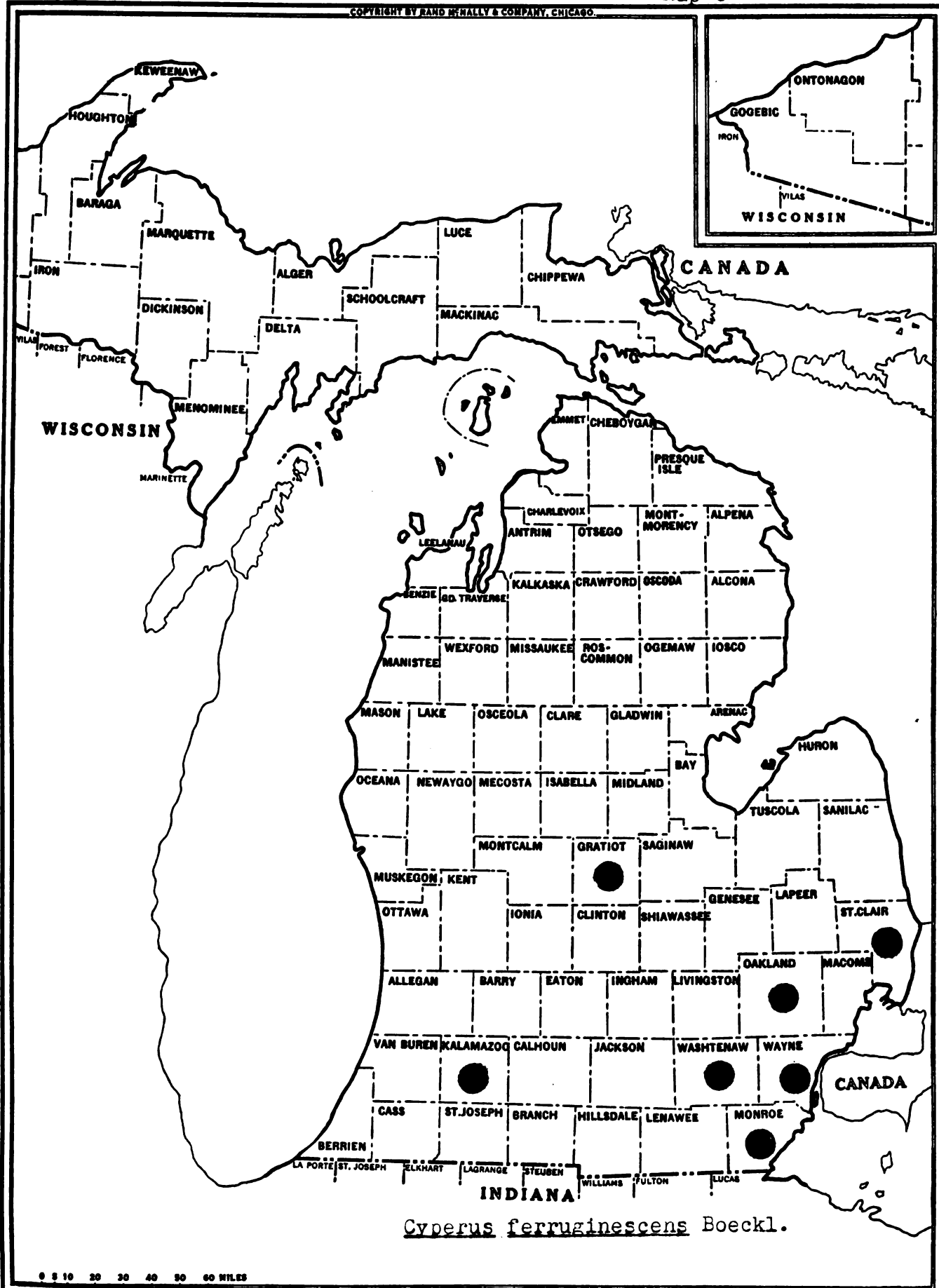


Cyperus inflexus Muhl.

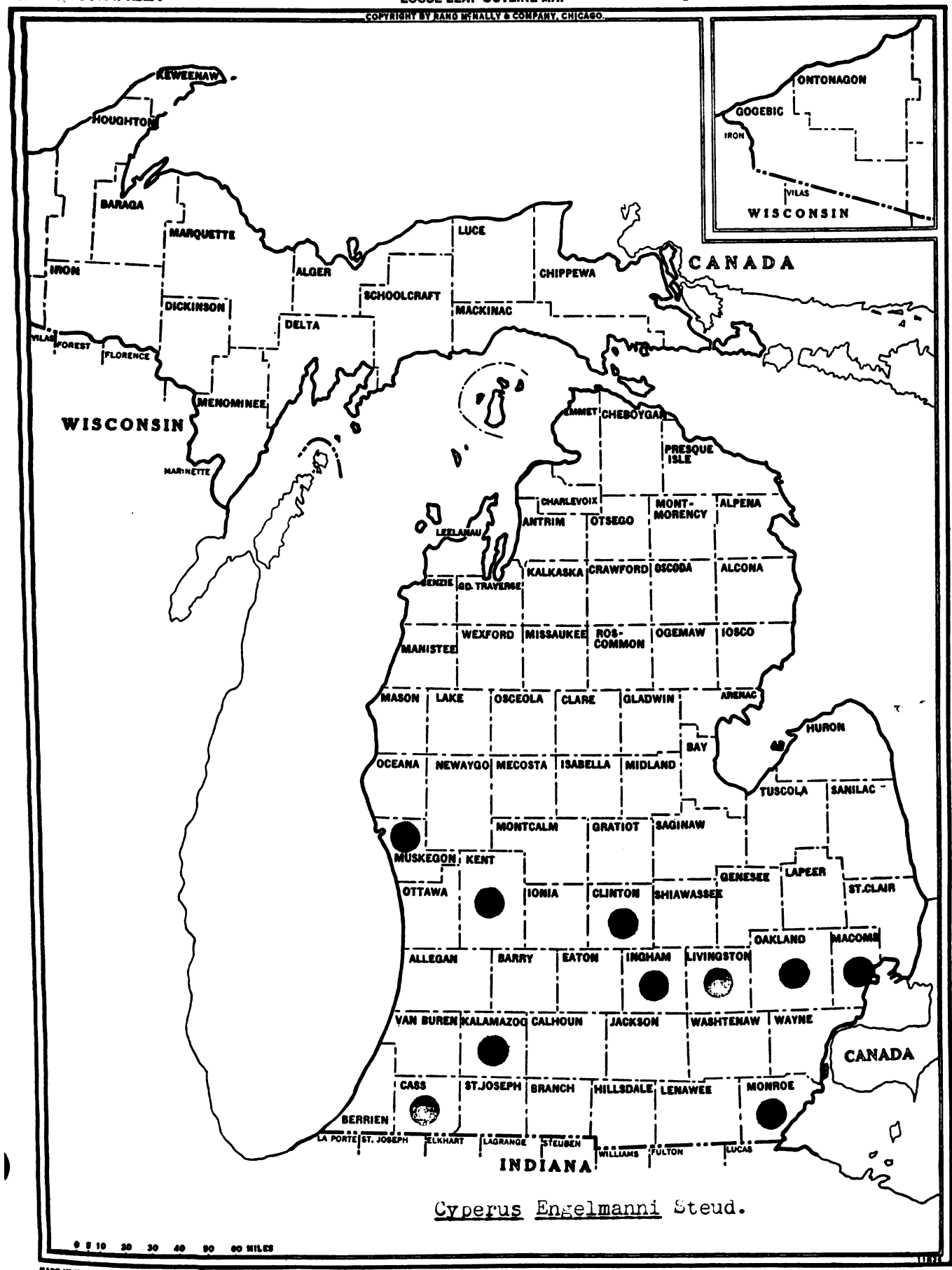
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Cyperus erythrorhizos Muhl.



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Cyperus Engelmanni Steud.

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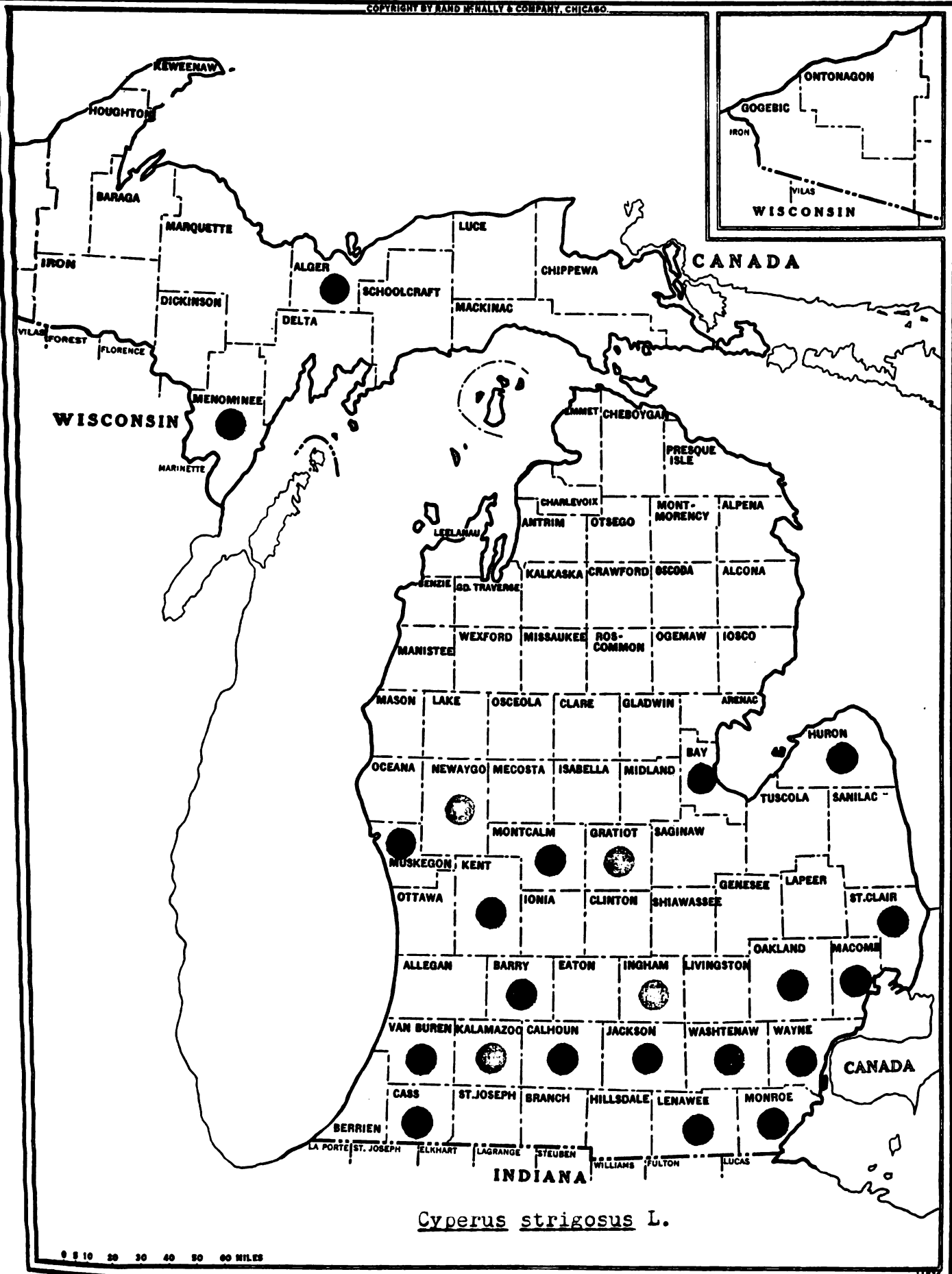


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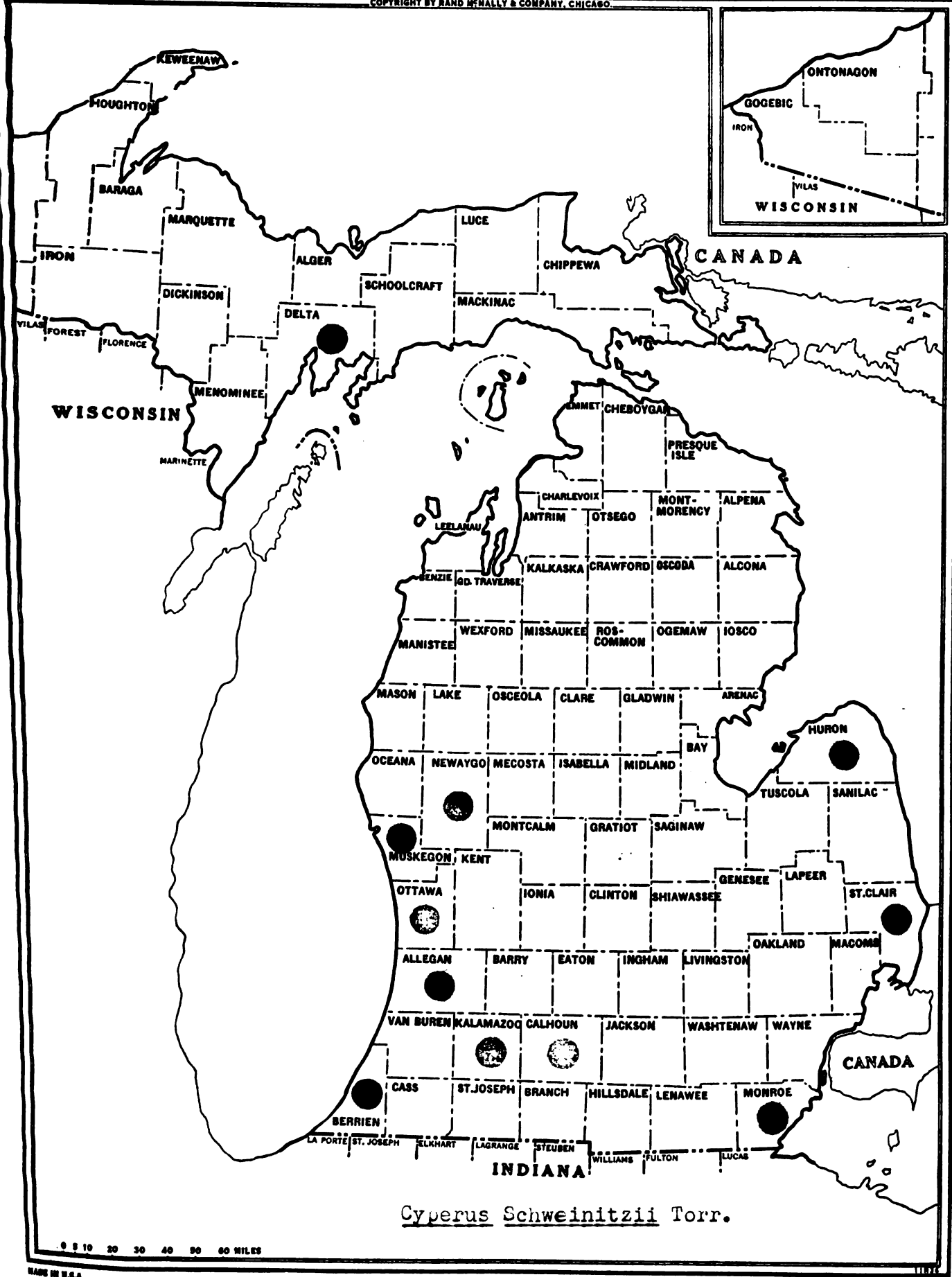
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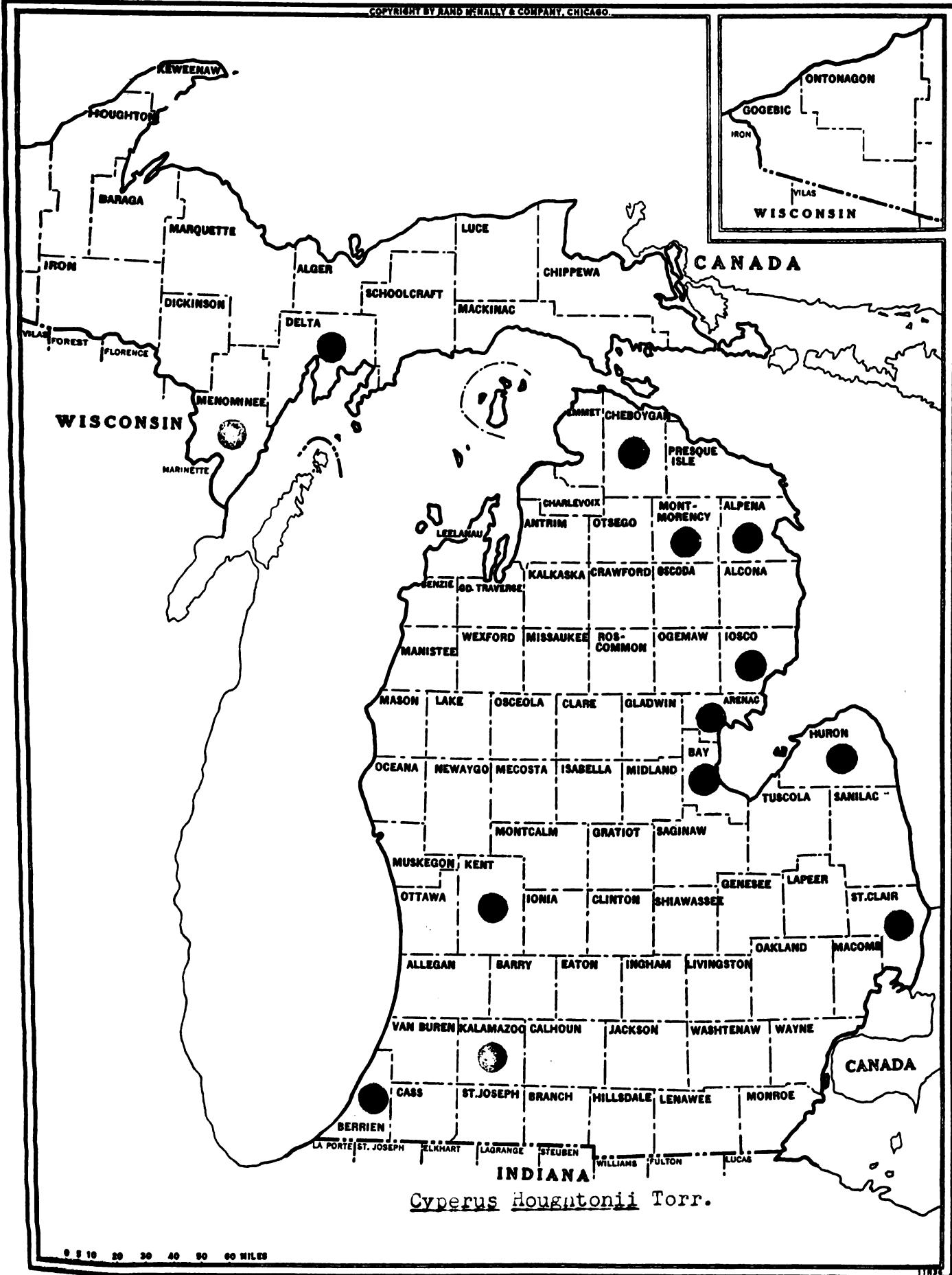


Cyperus strigosus L.

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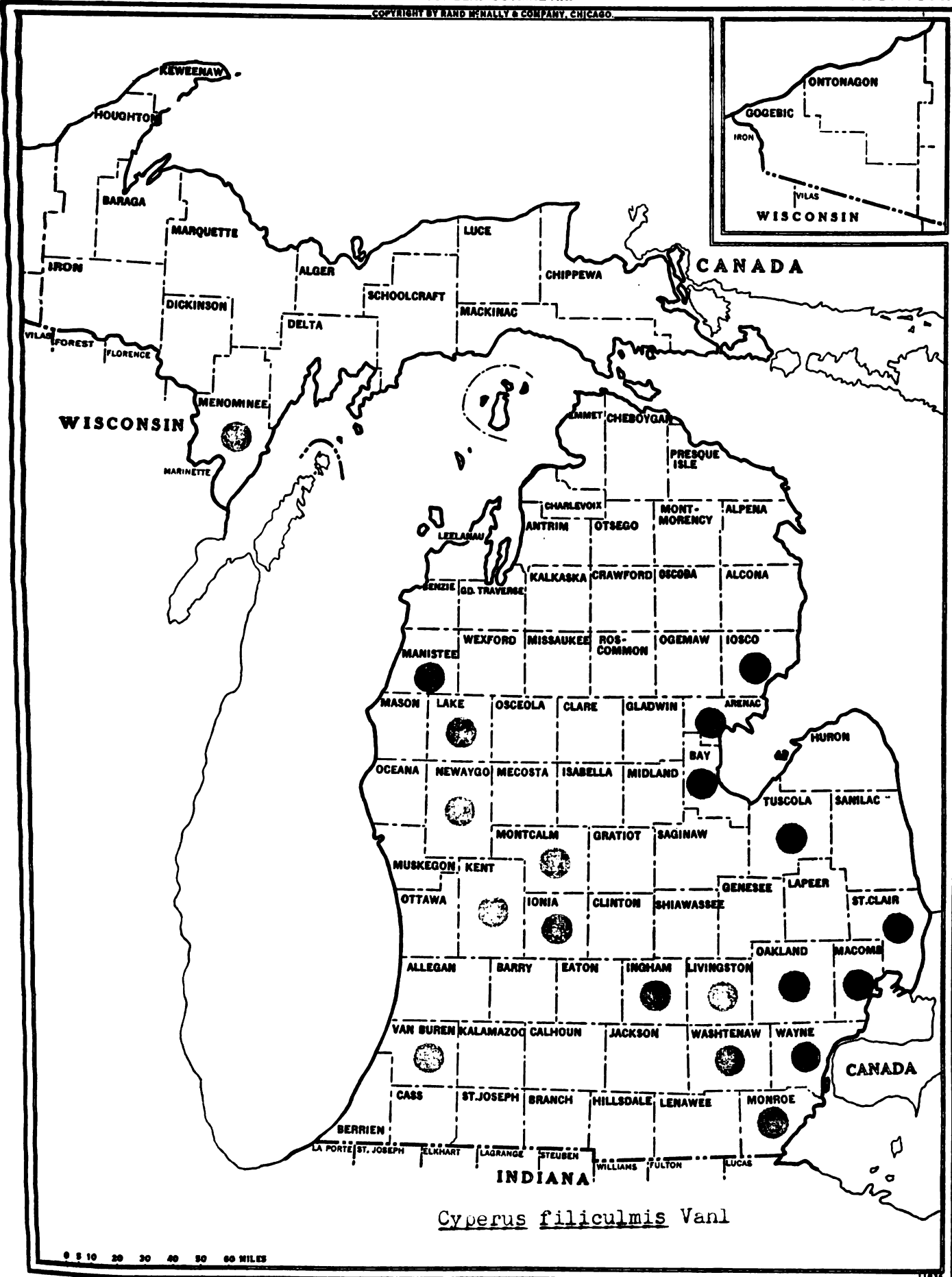


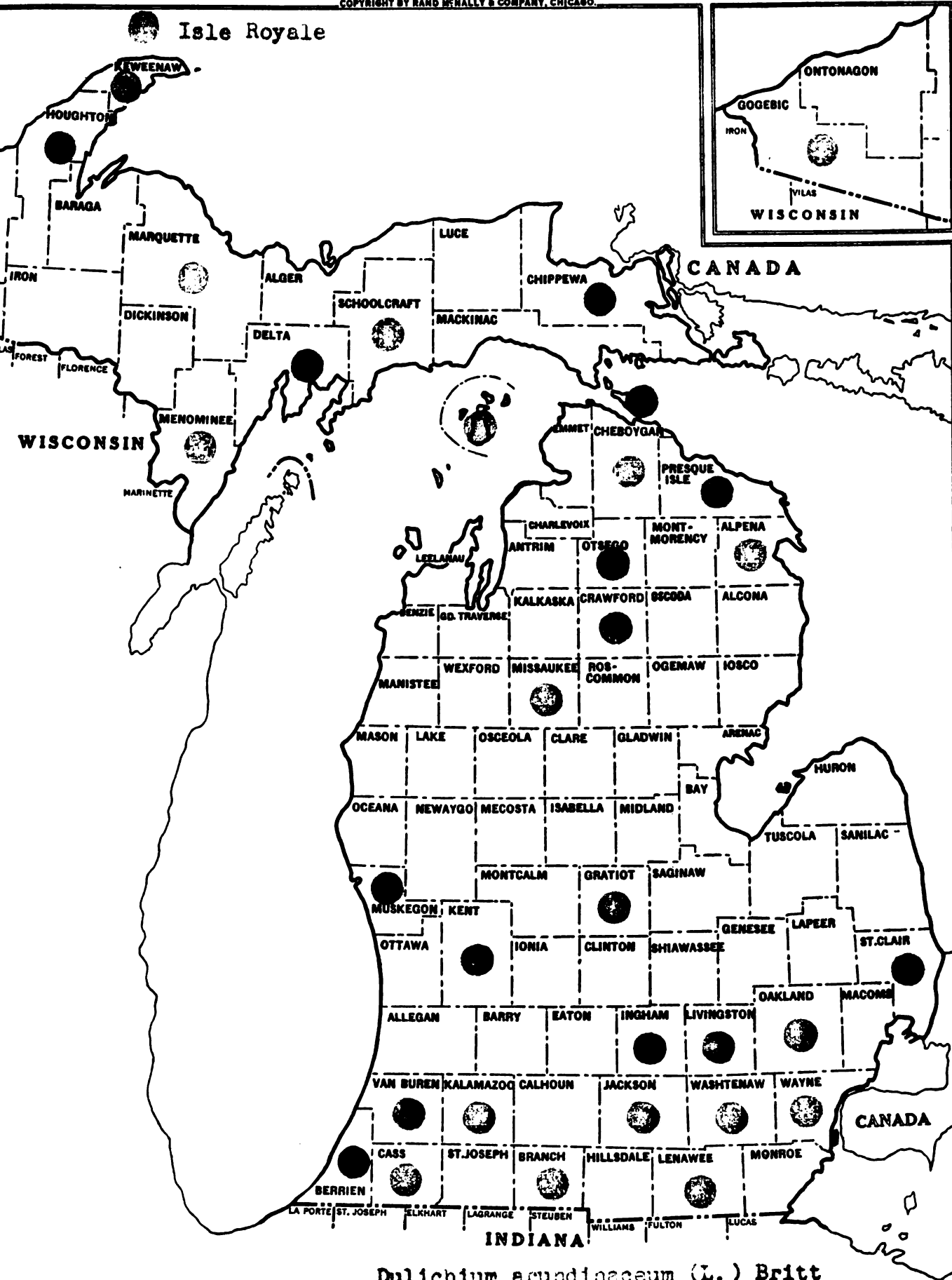
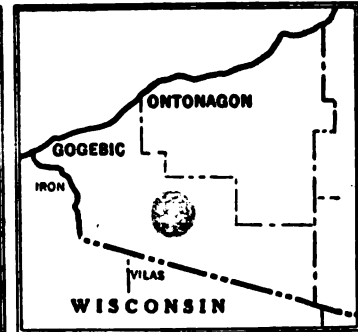
Cyperus Schweinitzii Torr.



Cyperus Houghtonii Torr.

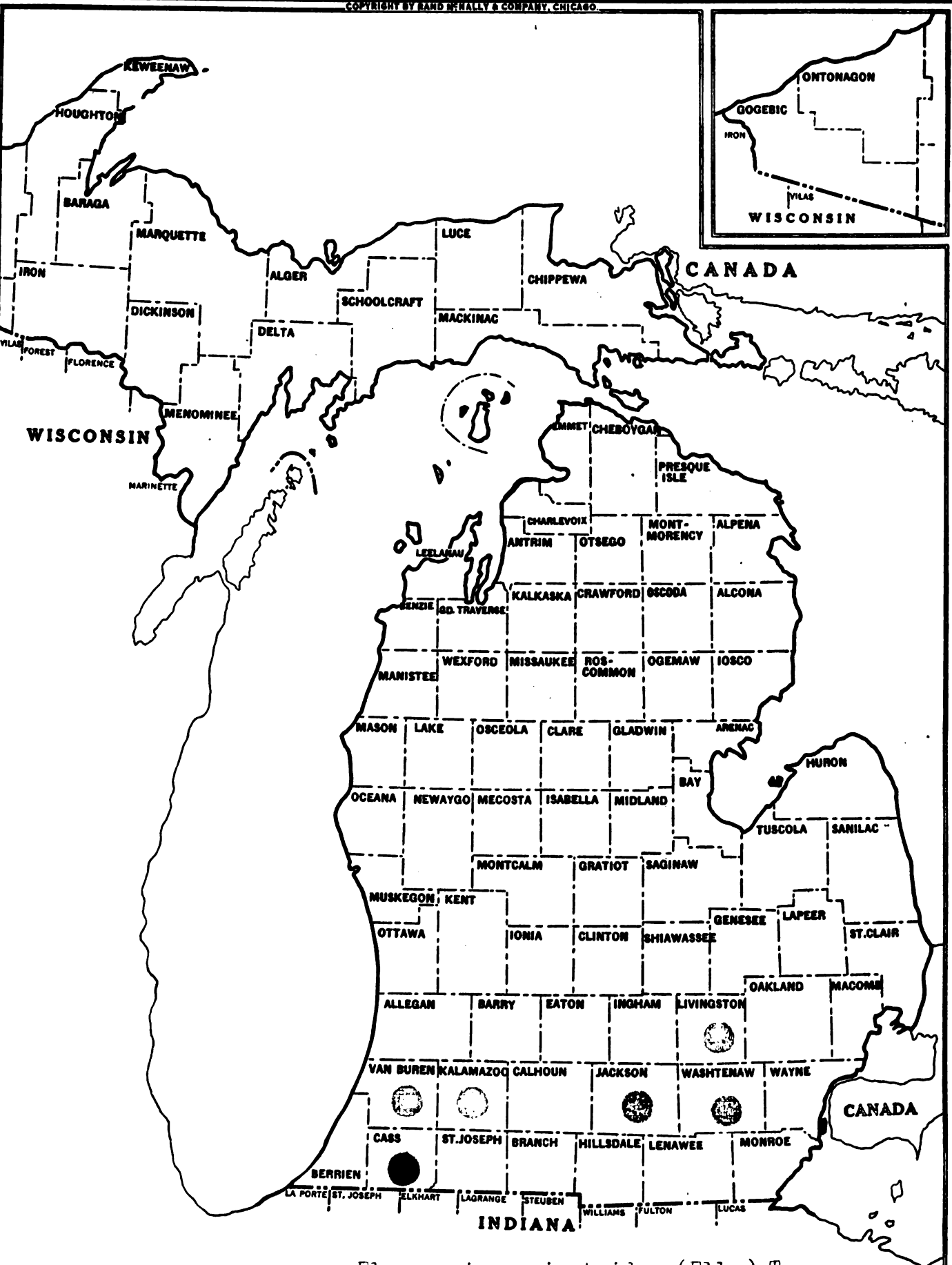
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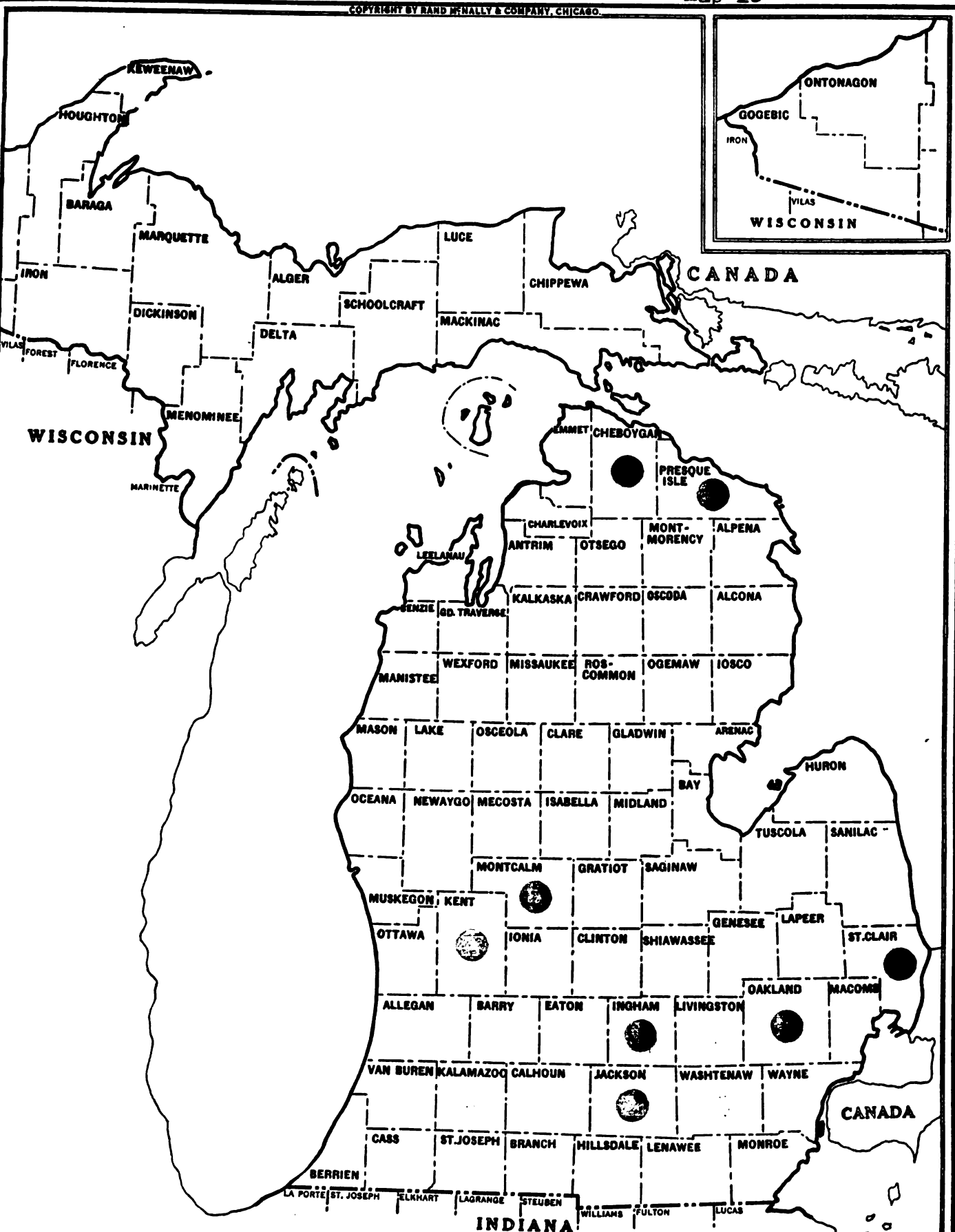
Dulichium arundinaceum (L.) Britt

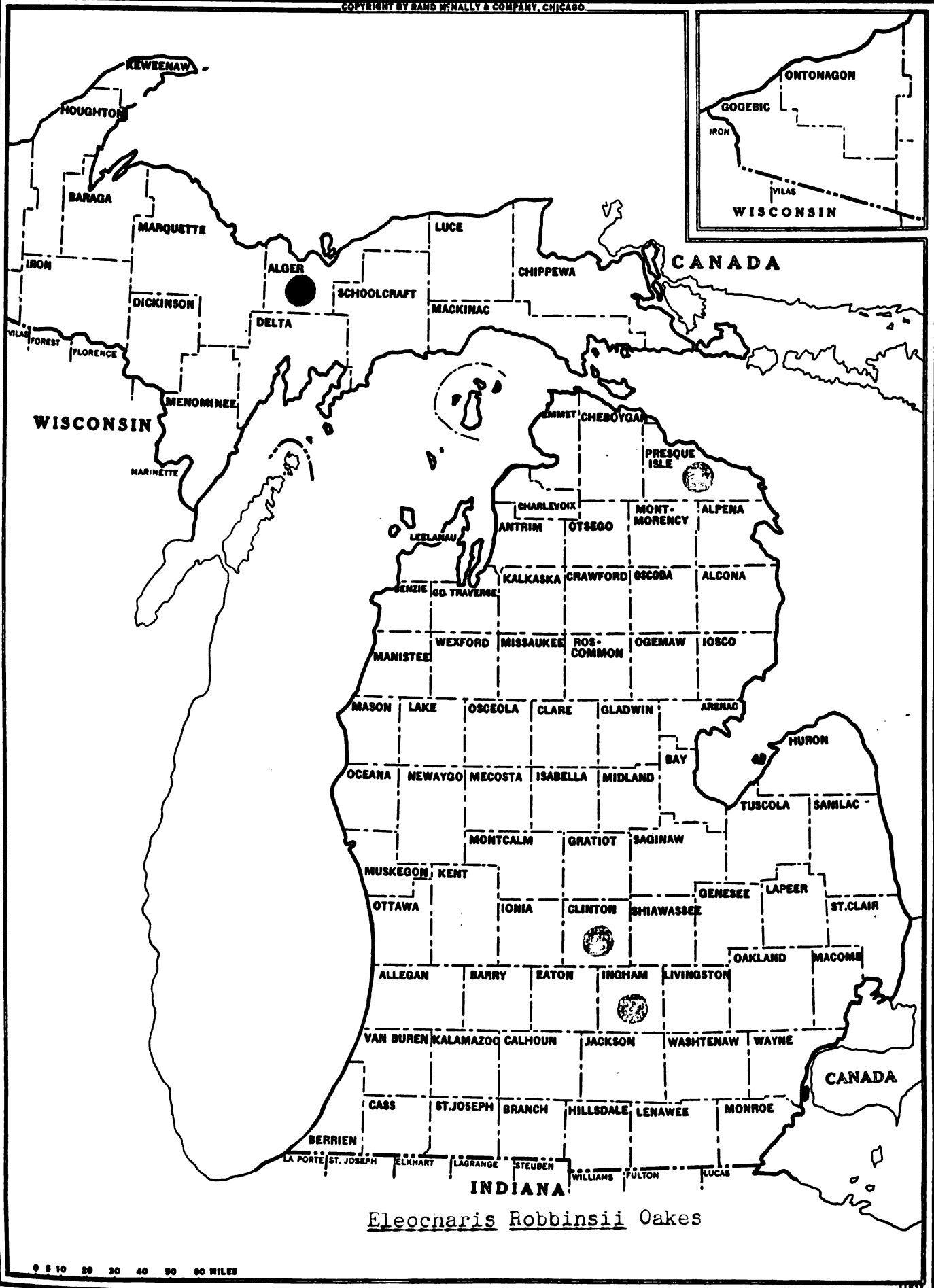
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Eleocharis equisetoides (Ell.) Torr.

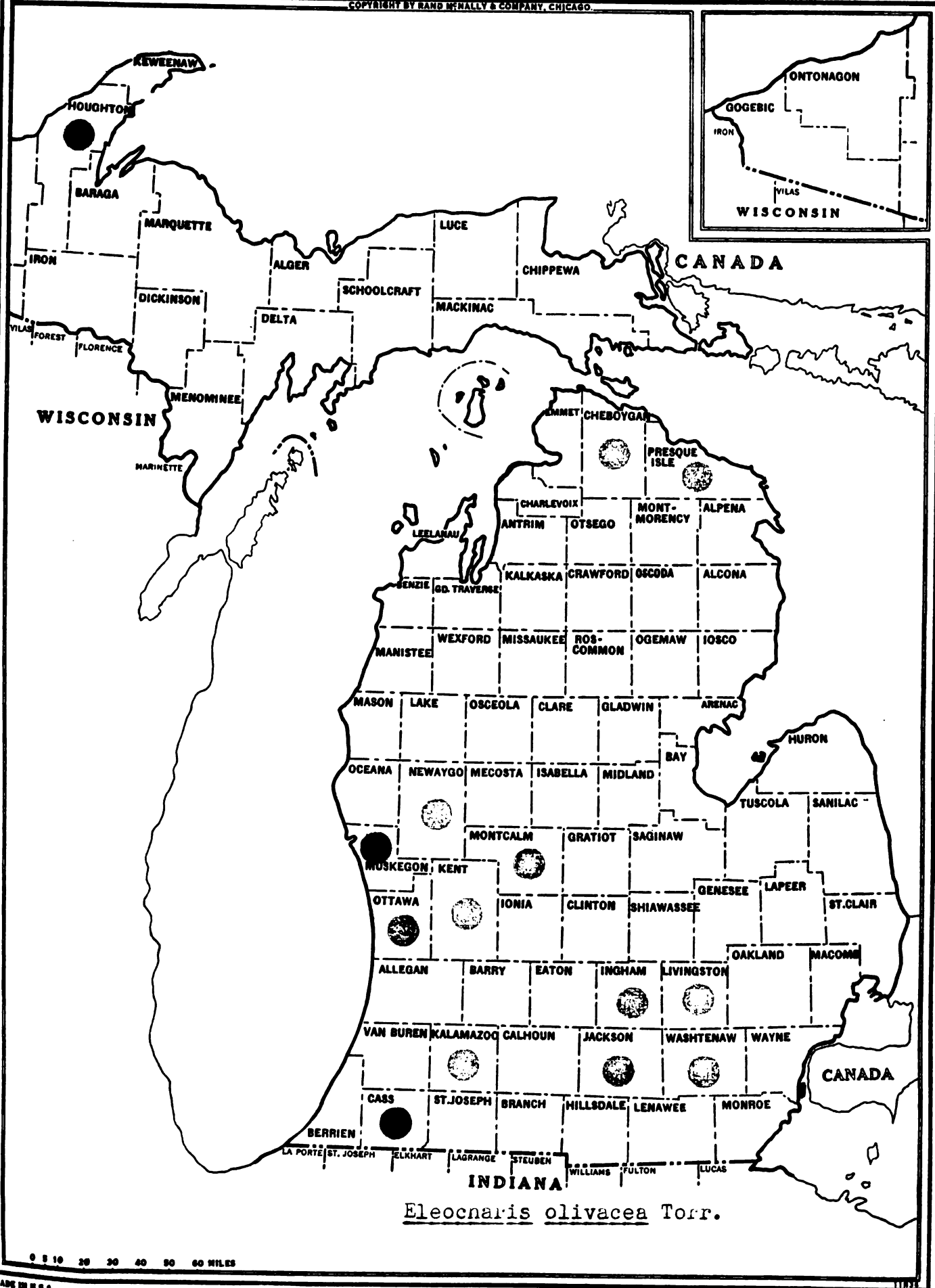
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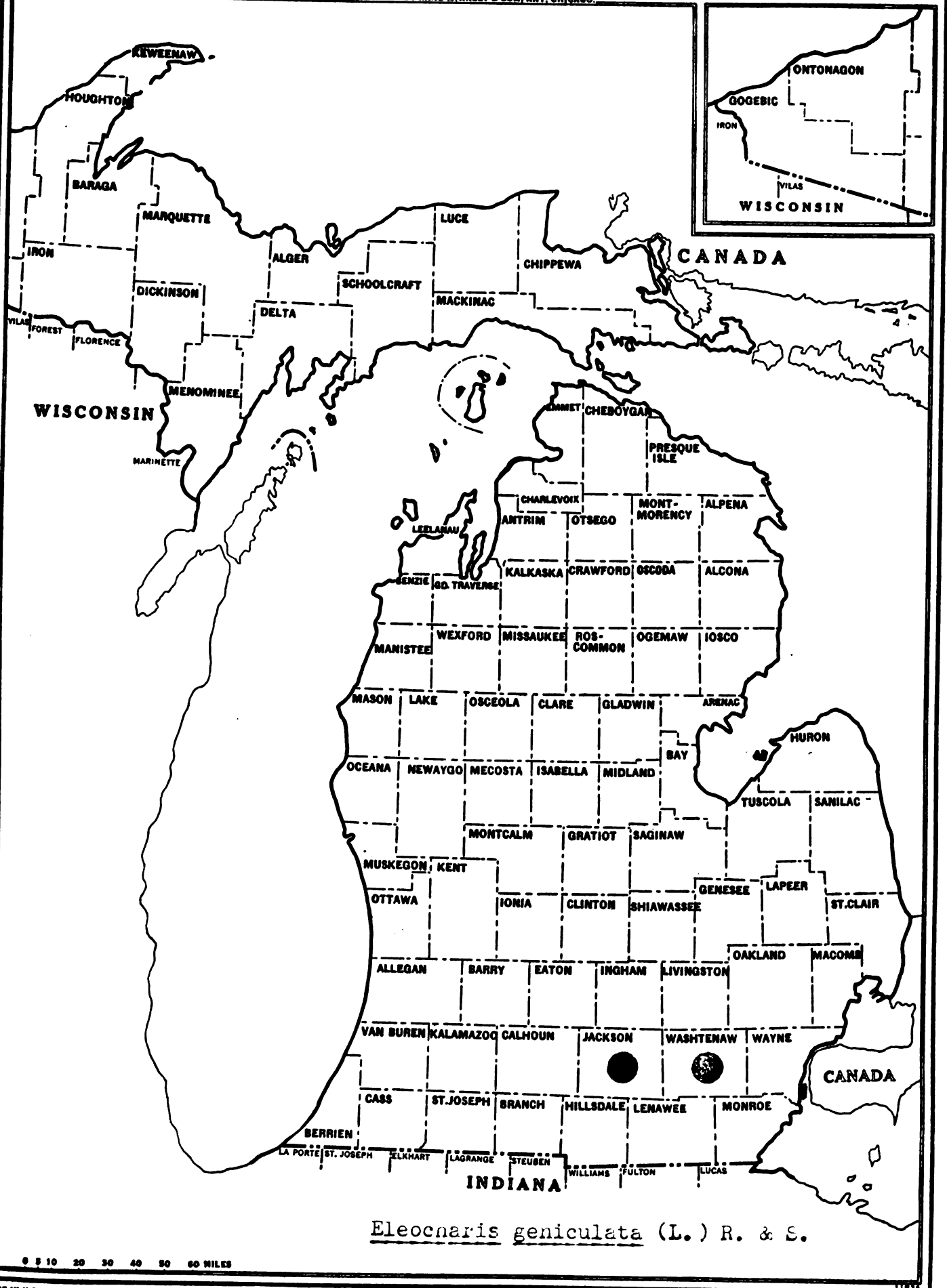
*Eleocnaris quadrangulata* (Micx.)R. & S. var. *crassior* Fern.



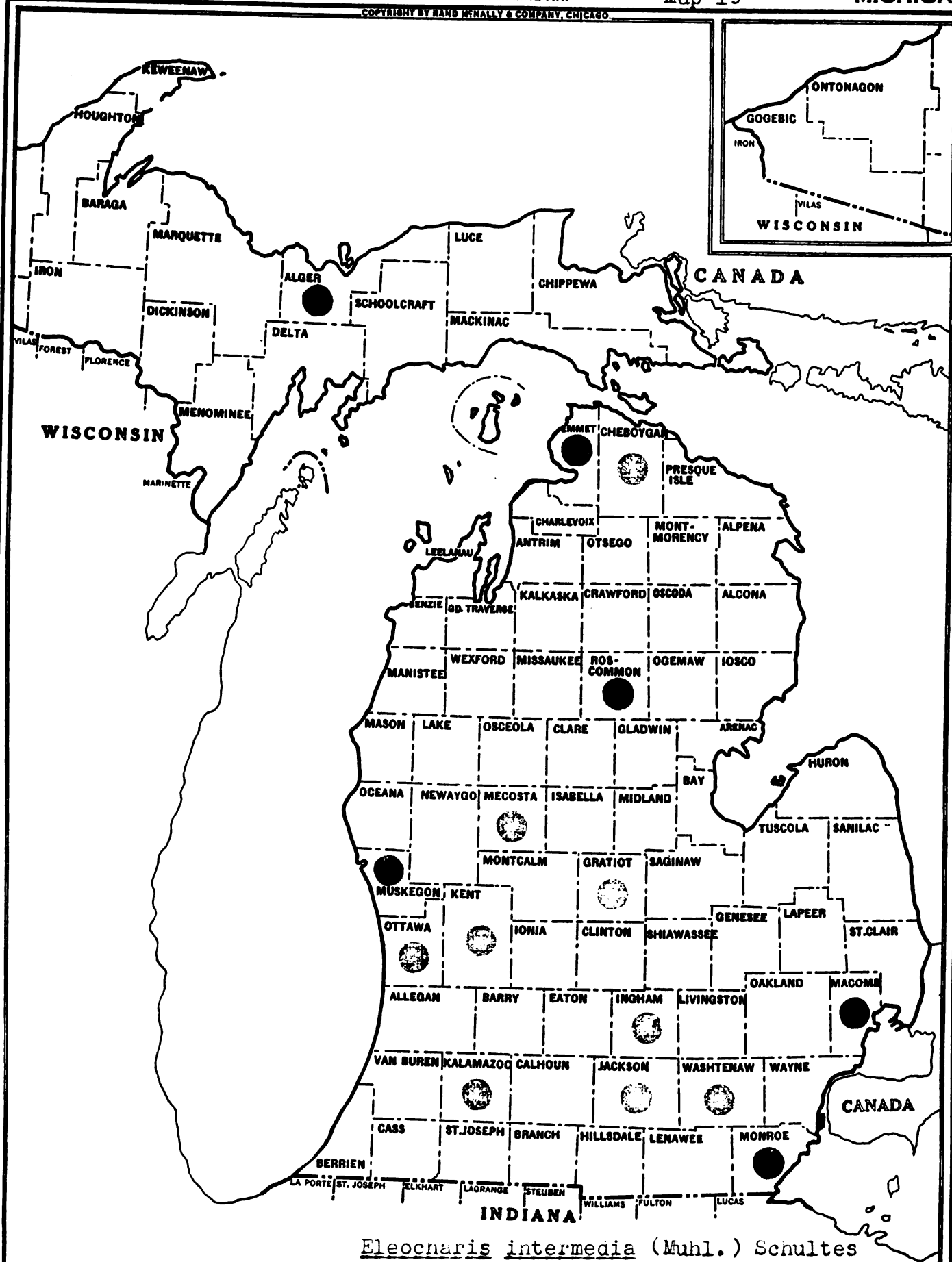
Eleocharis Robbinsii Oakes

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A map of Wisconsin with county boundaries indicated by dashed lines. The northern border is solid. Four counties are labeled: Gogebic in the northwest, Ontonagon in the north-central region, Iron in the west, and Vilas in the south-central region. The word 'WISCONSIN' is printed in large, bold, capital letters at the bottom of the state outline.

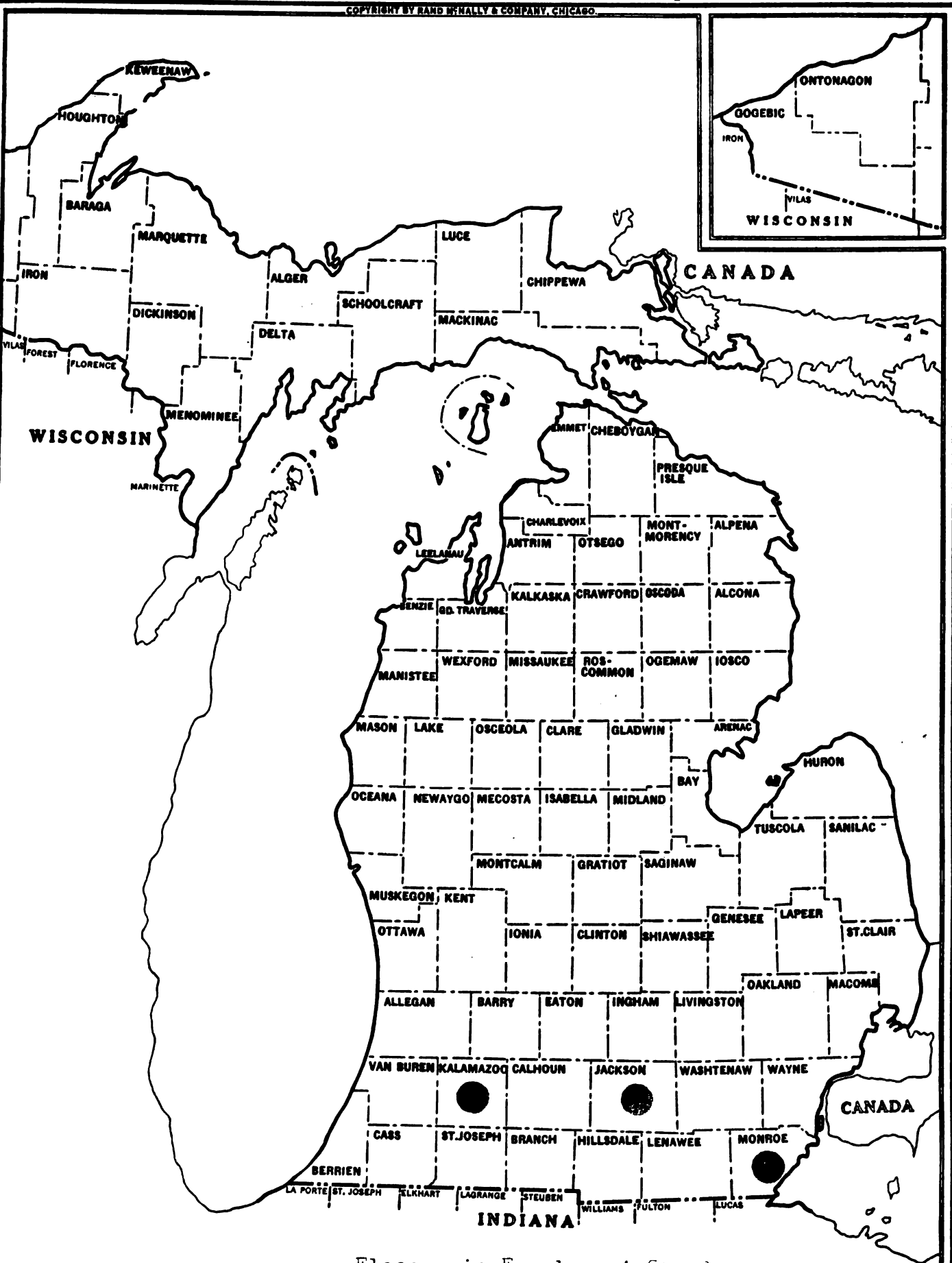


Eleocharis intermedia (Muhl.) Schultes

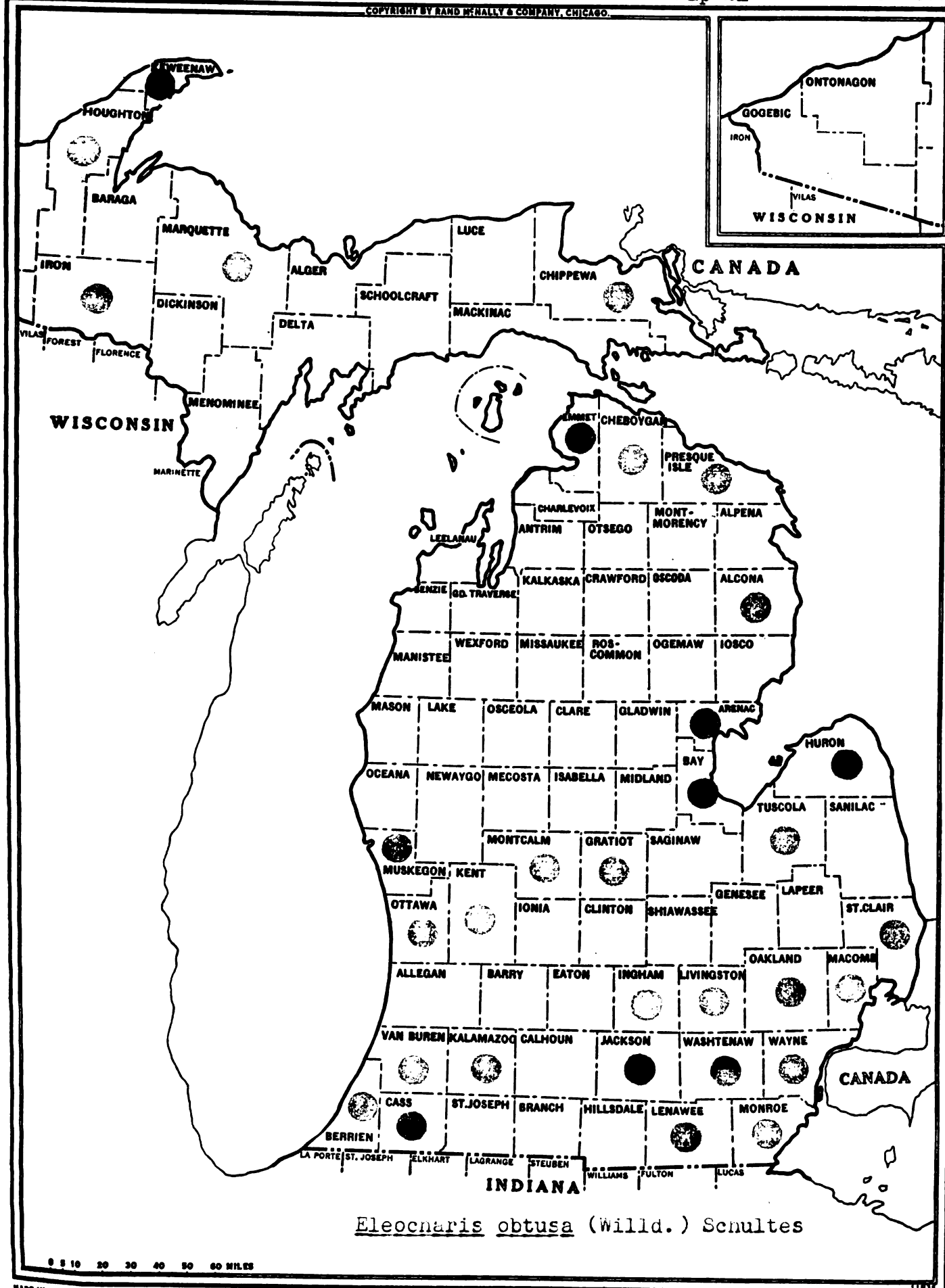
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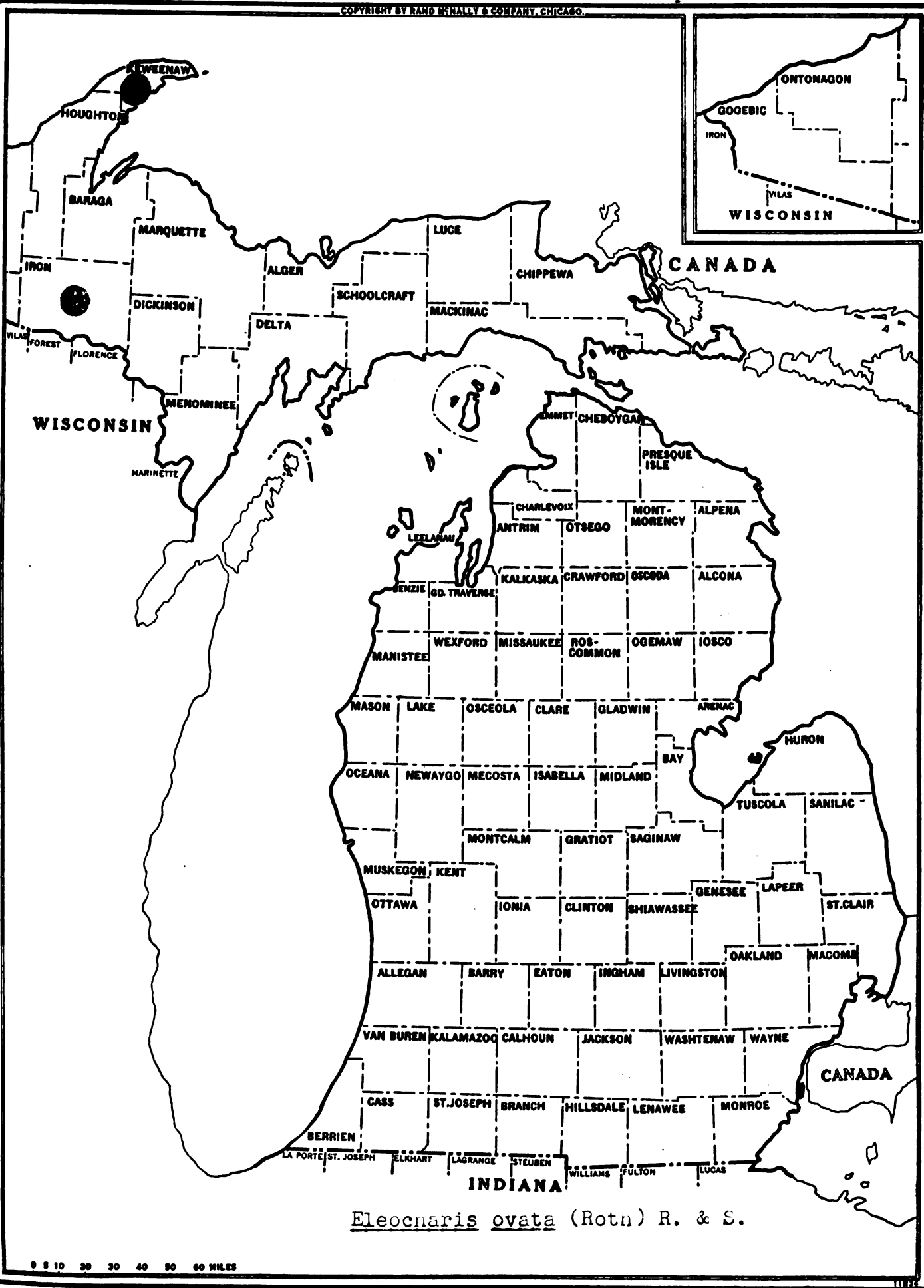


Eleocharis Engelmanni Steud.



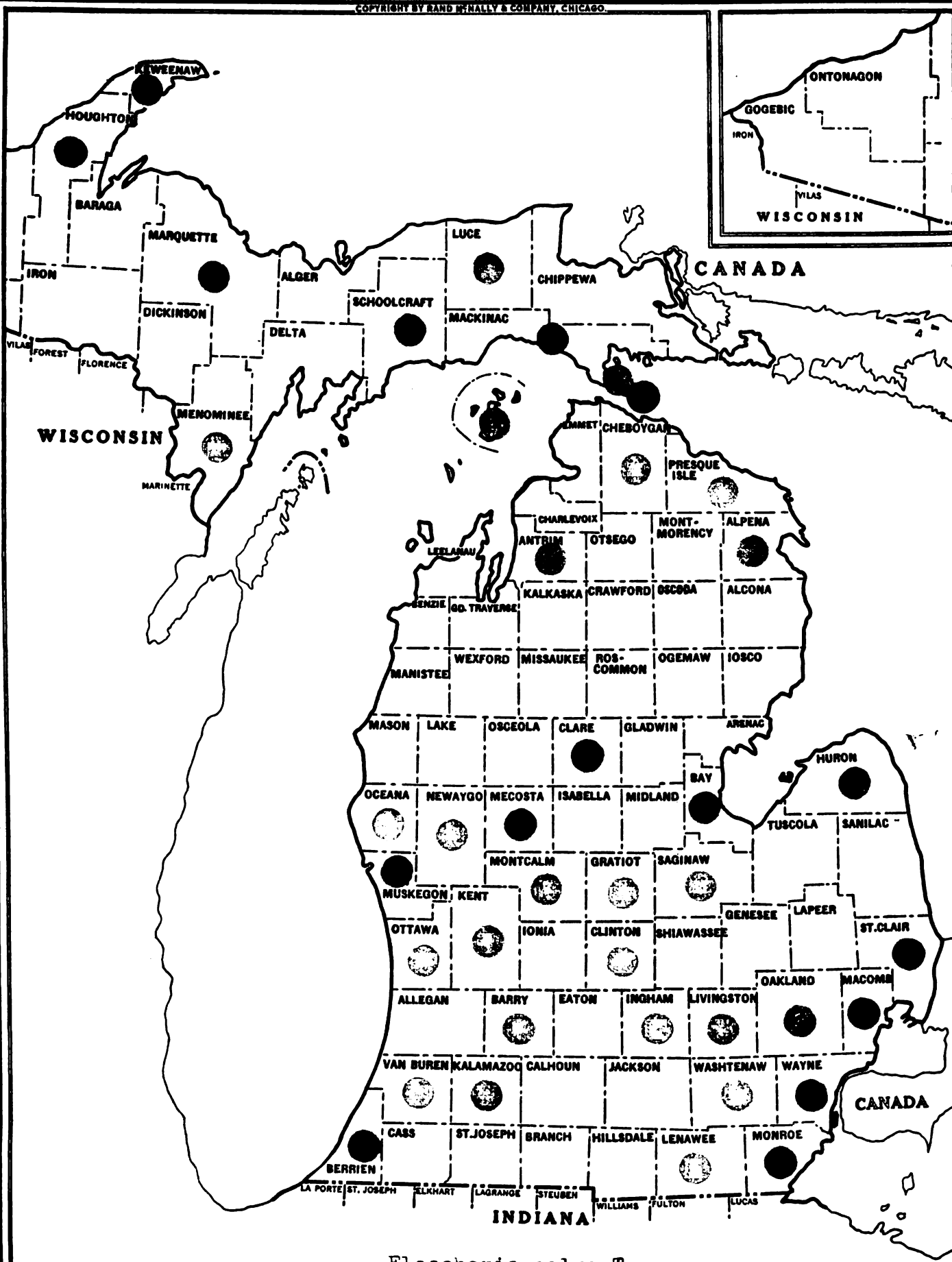
Eleocharis obtusa (Willd.) Schultes

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Eleocharis ovata (Roth) R. & S.

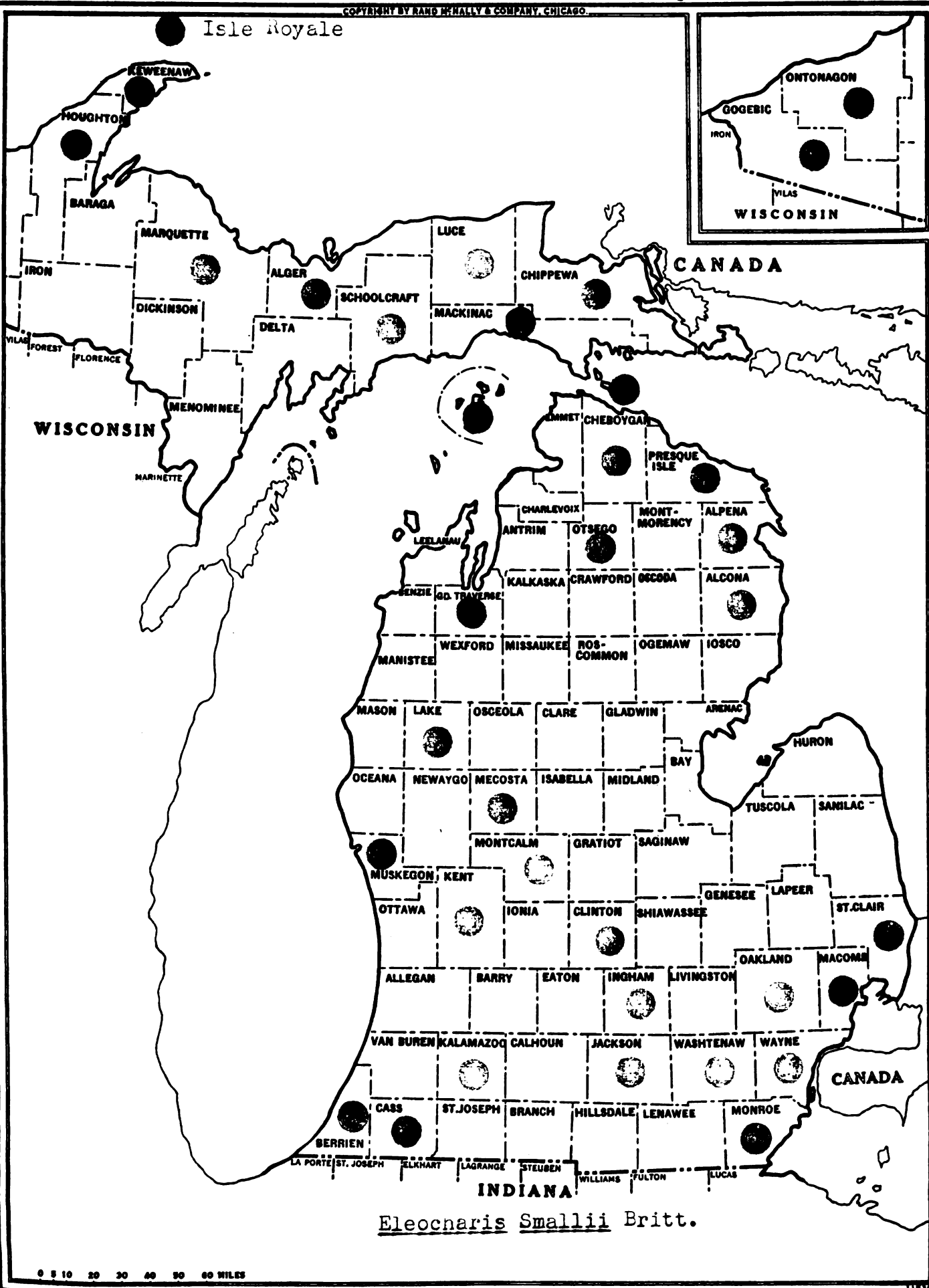
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Eleocharis calva Torr.

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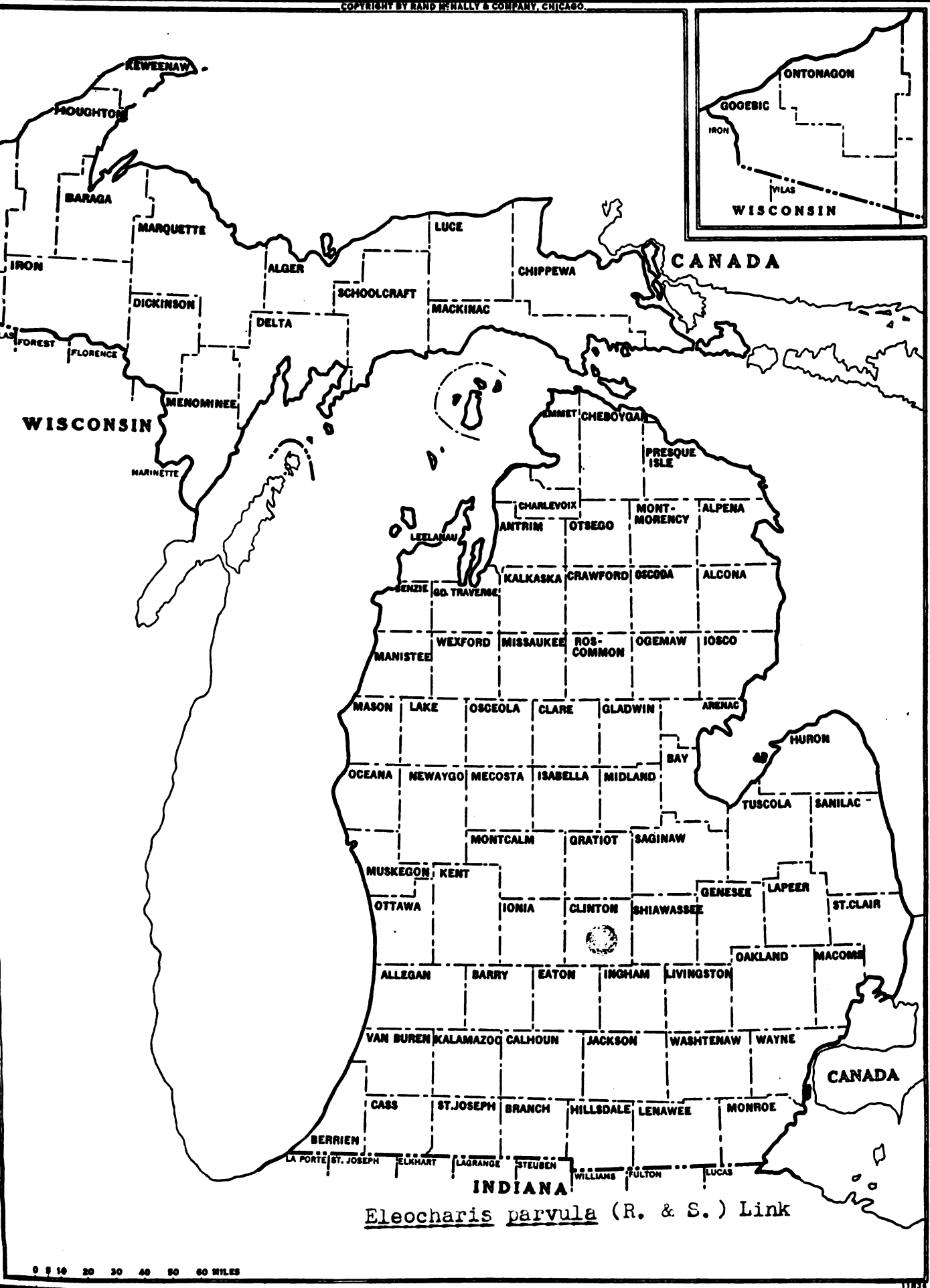
Eleocharis Smallii Britt.

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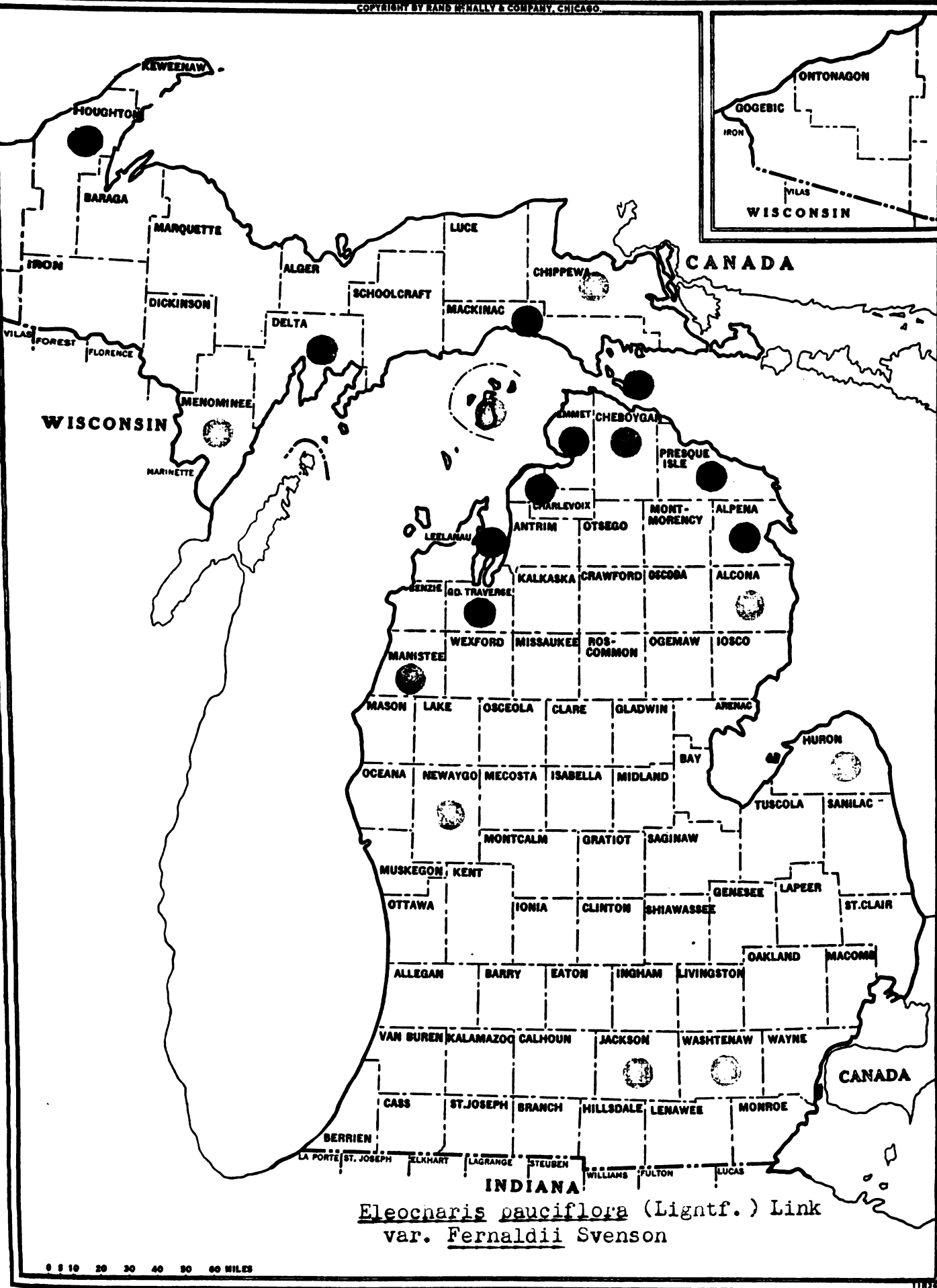
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This Map is also available in size 17 x 22

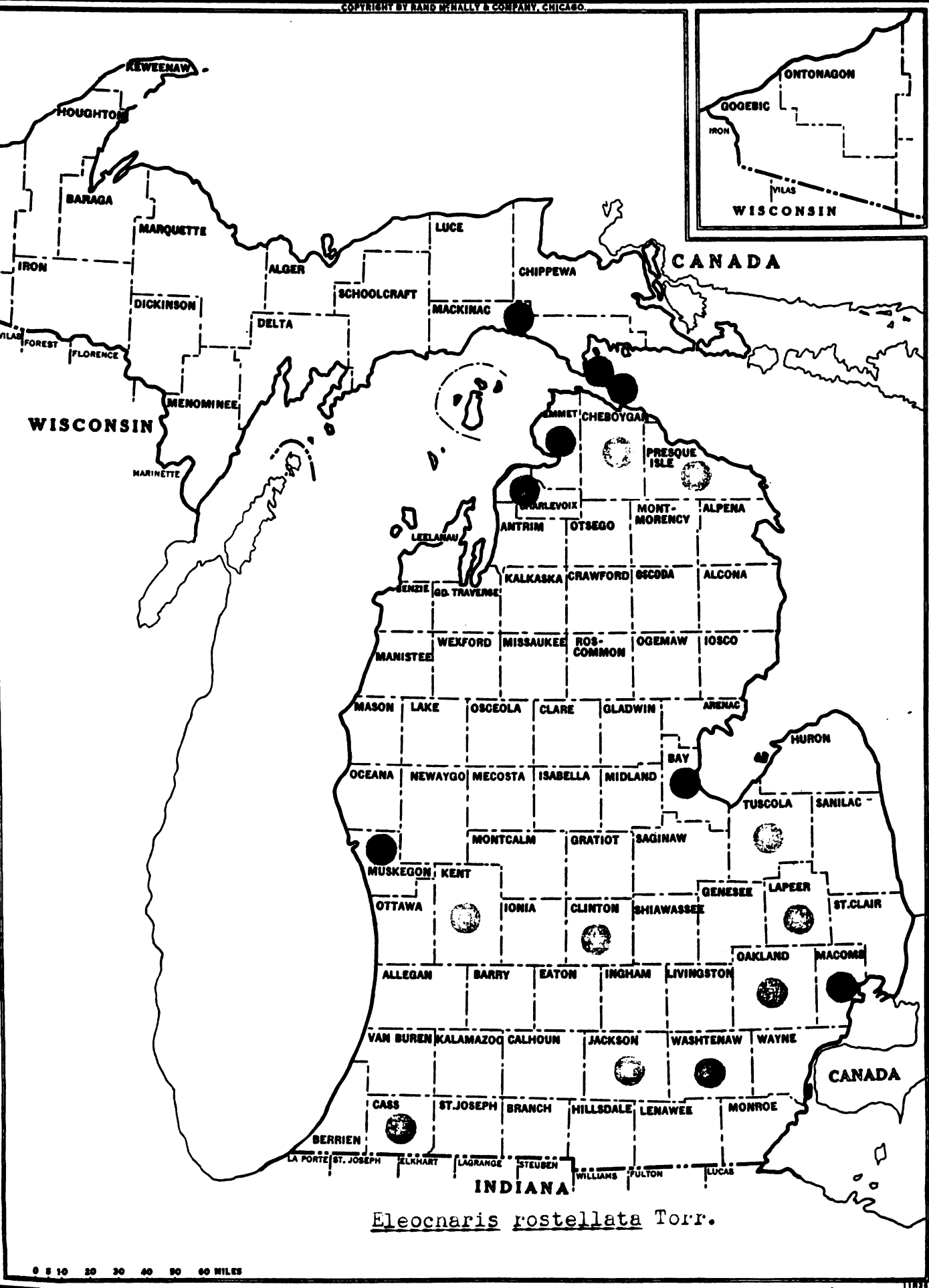
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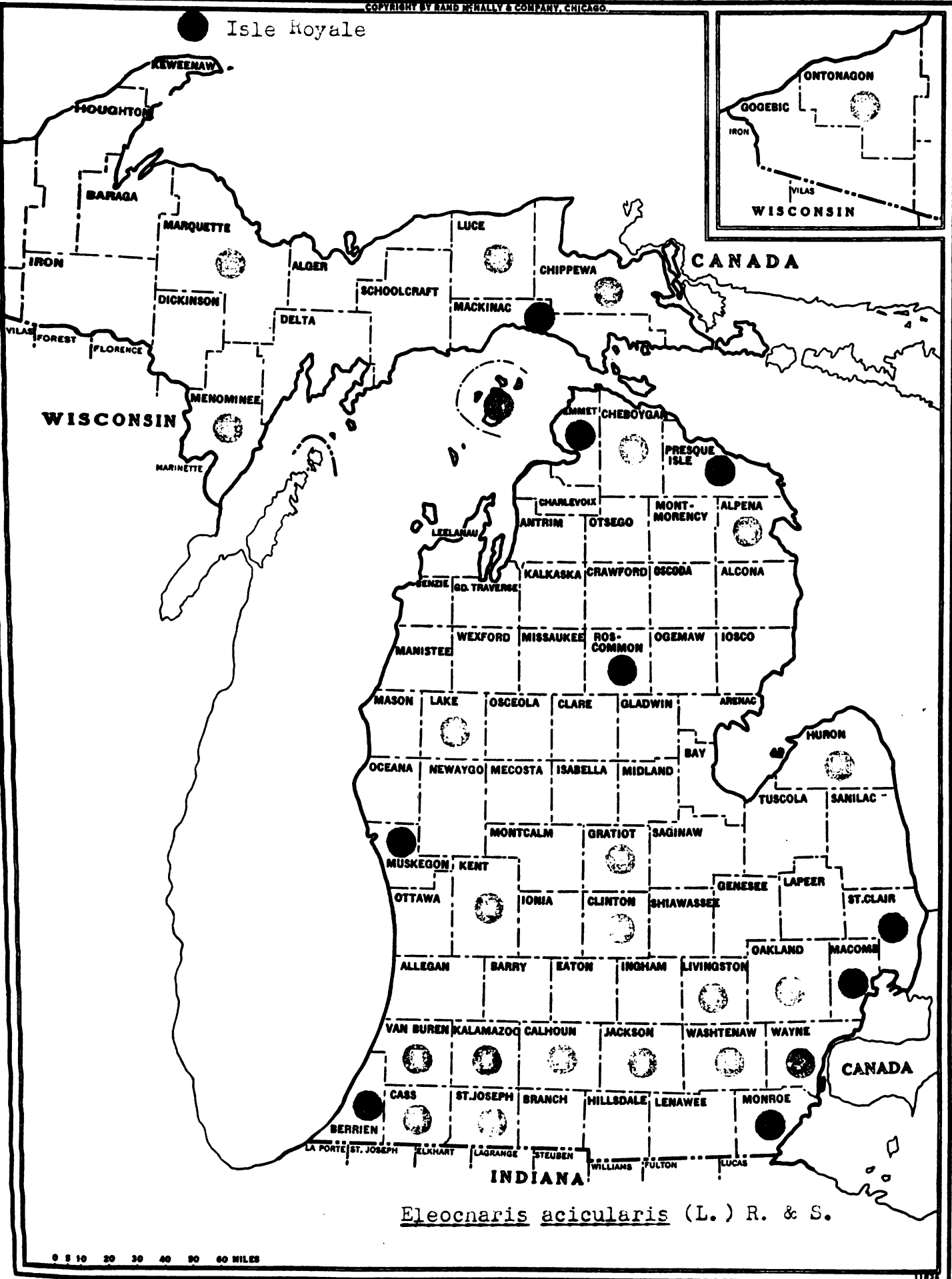
Eleocharis parvula (R. & S.) Link



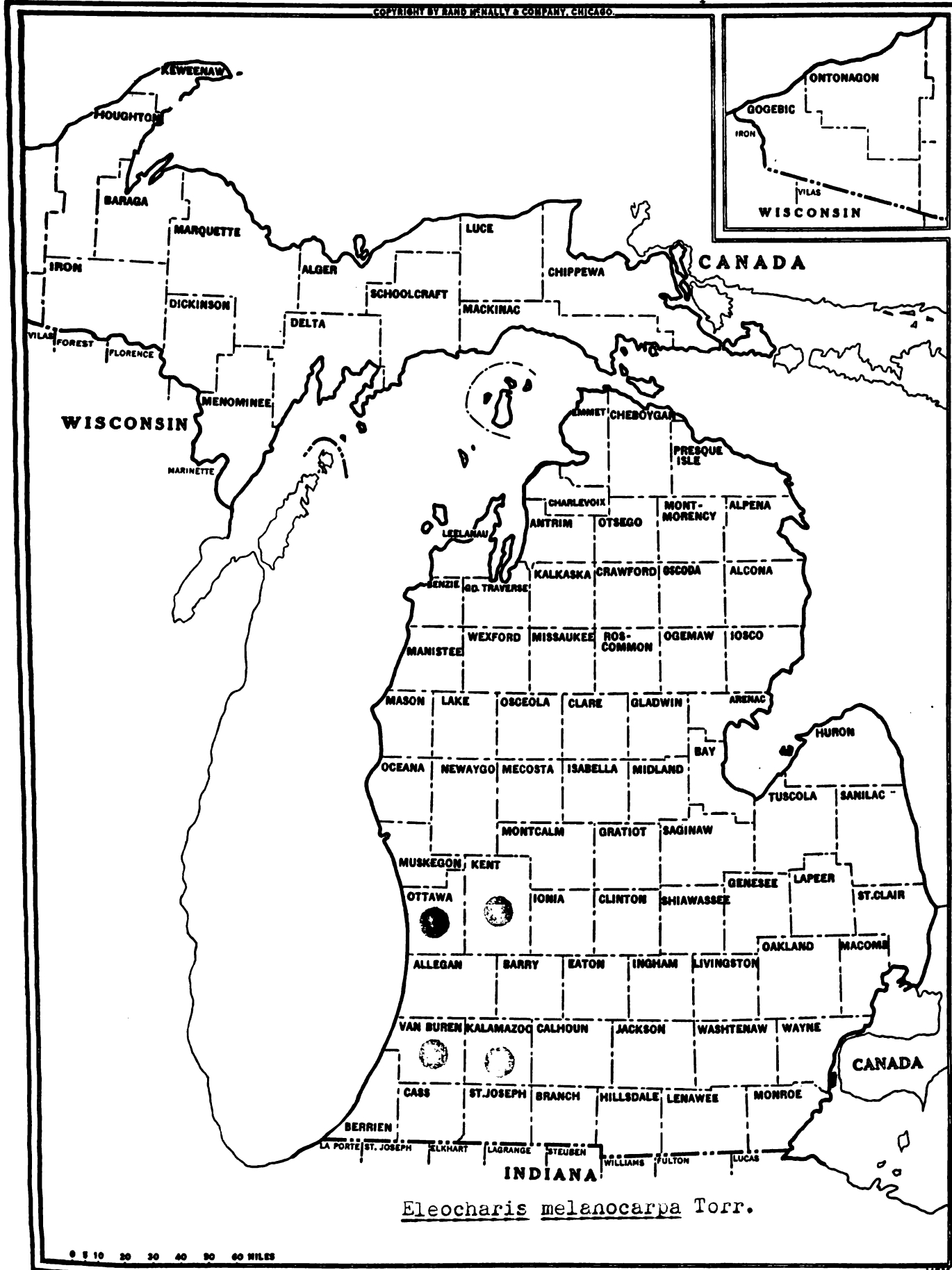
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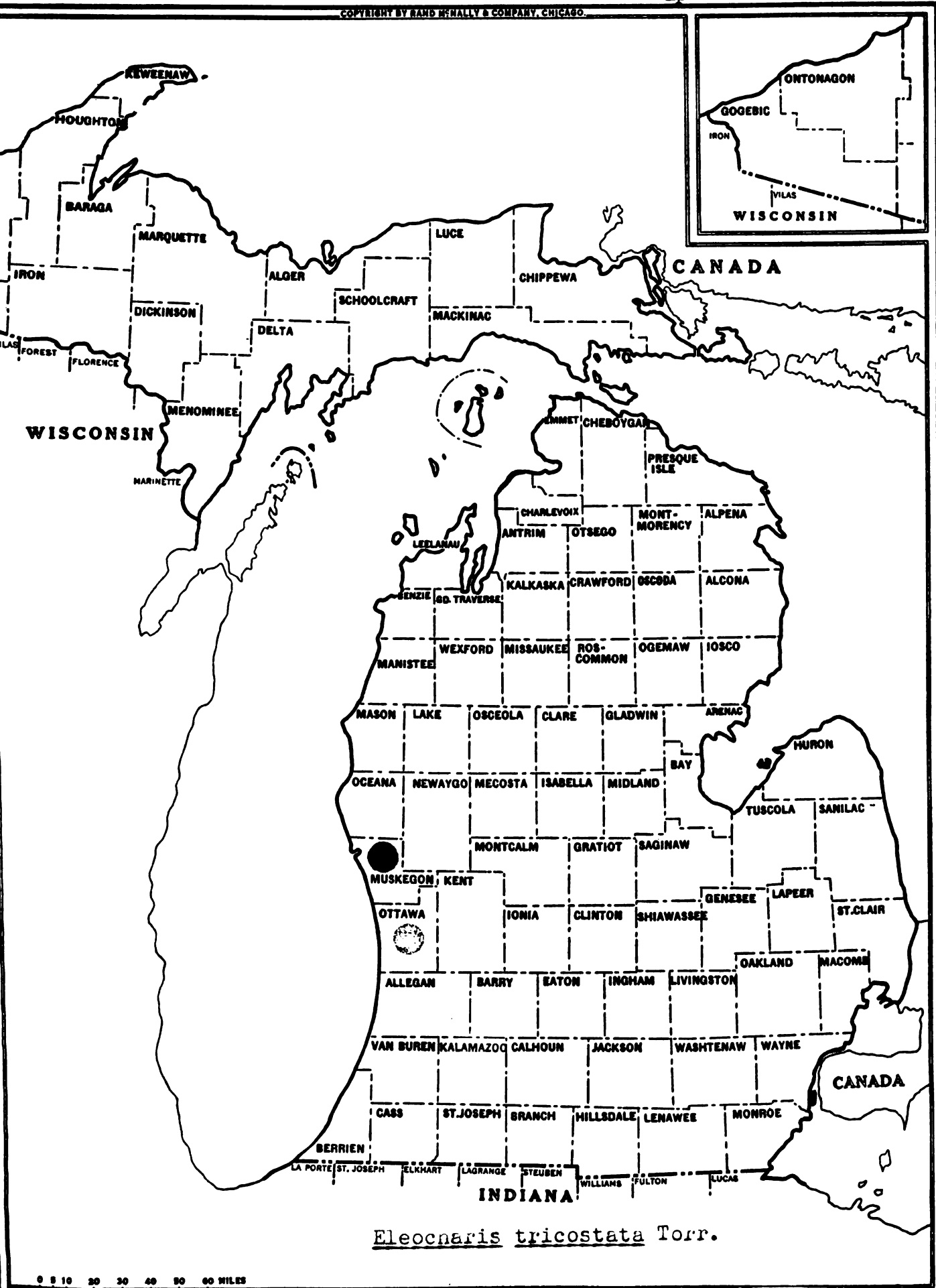
Eleocnaris rostellata Torr.



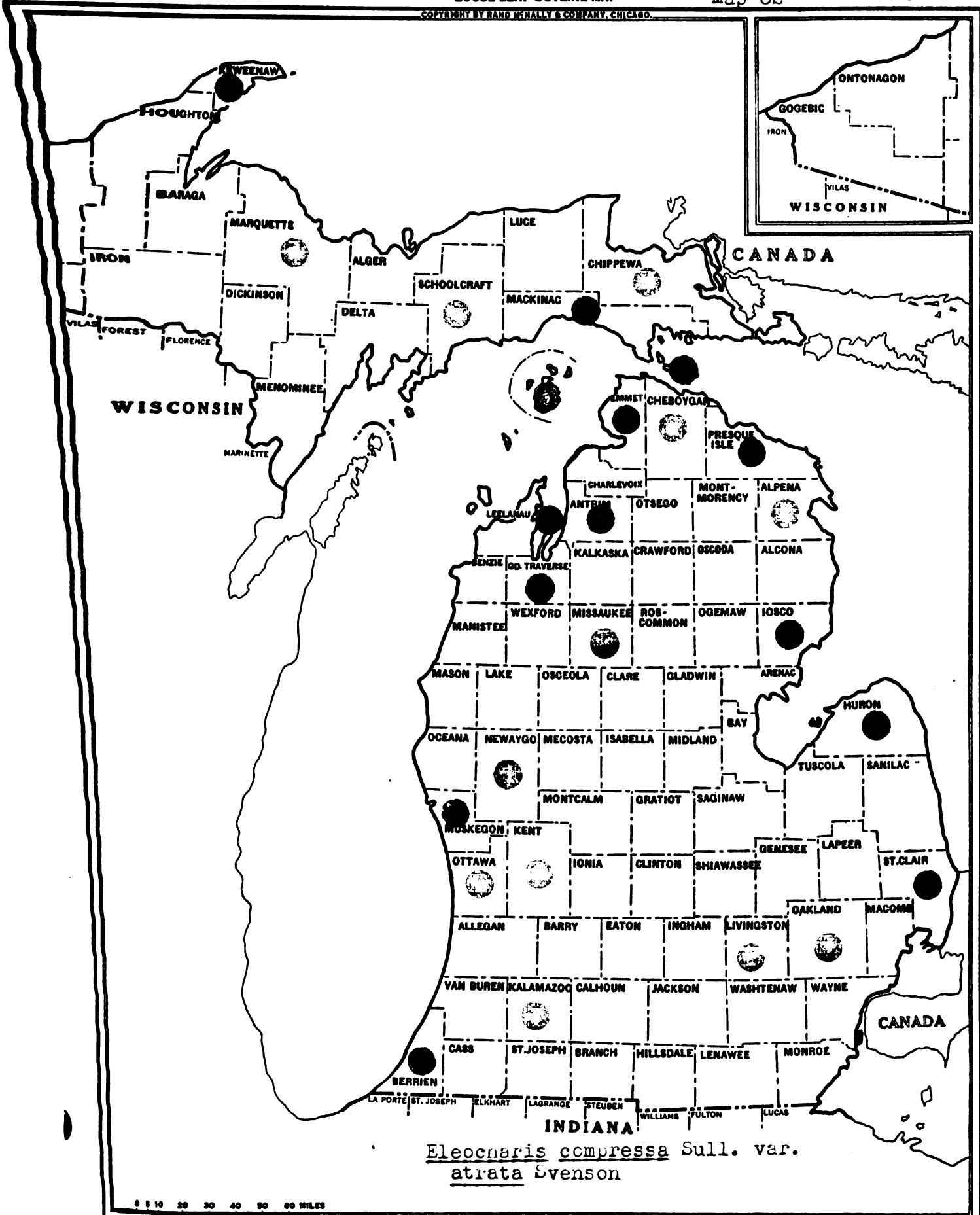
Eleocnaris acicularis (L.) R. & S.



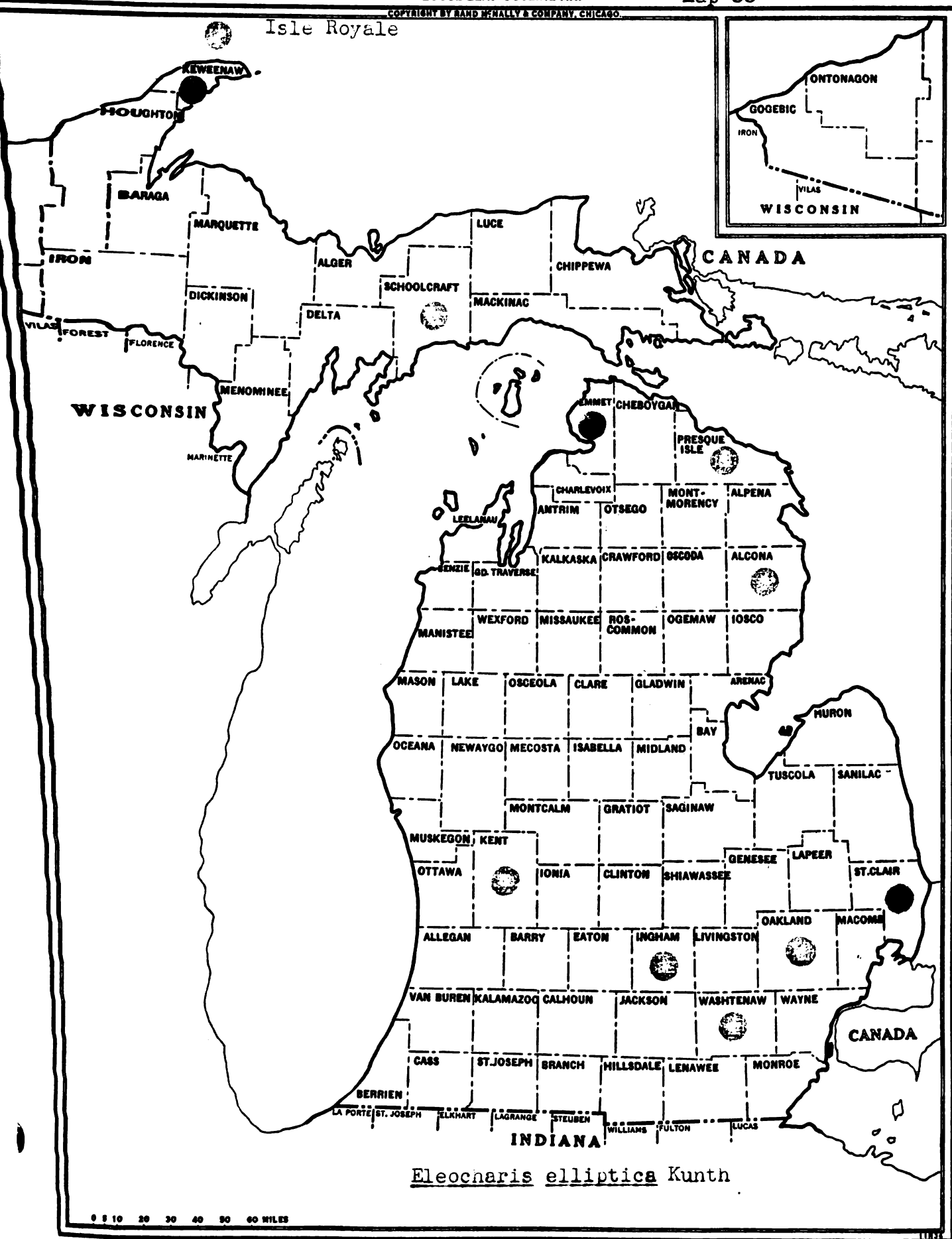
Eleocharis melanocarpa Torr.

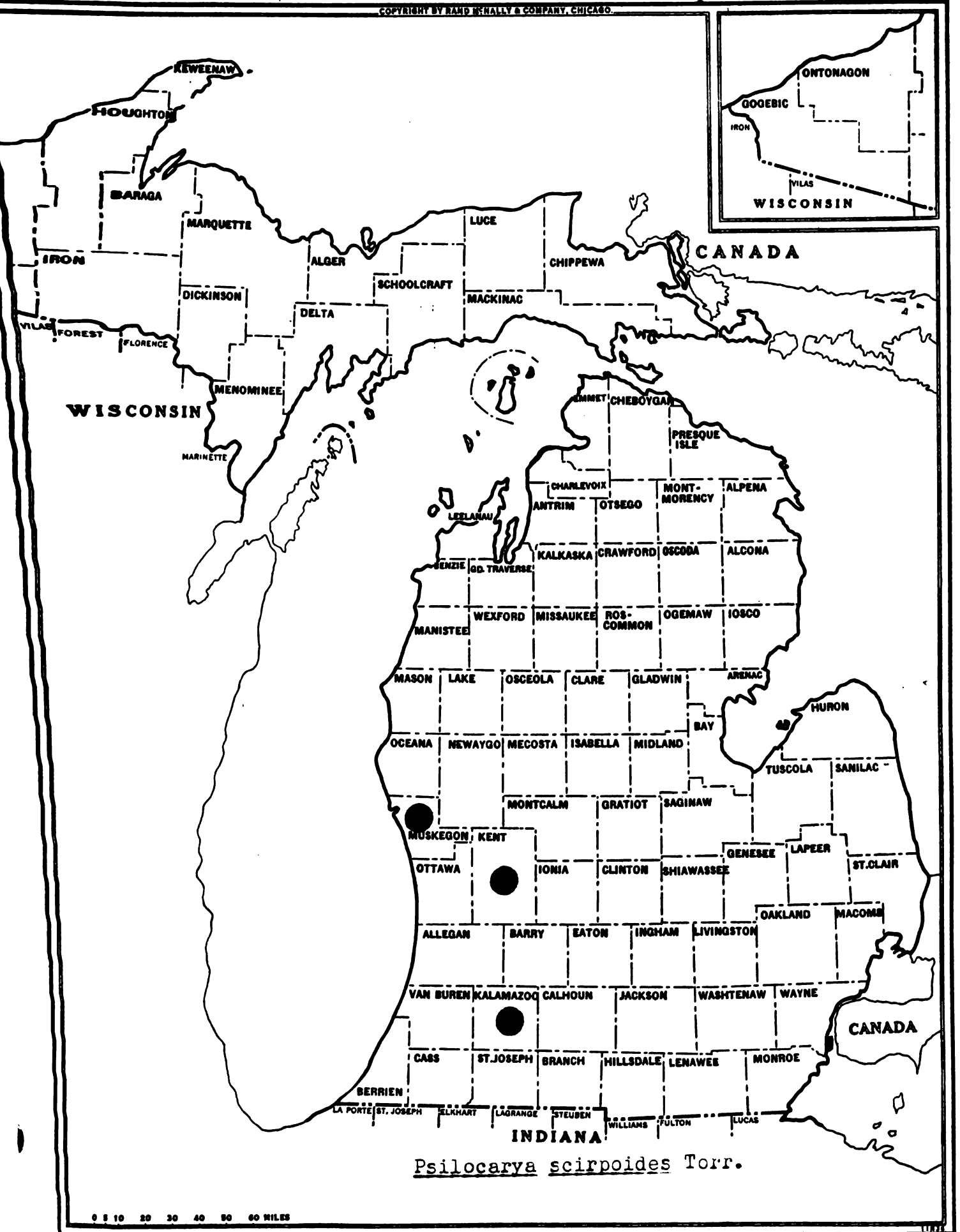




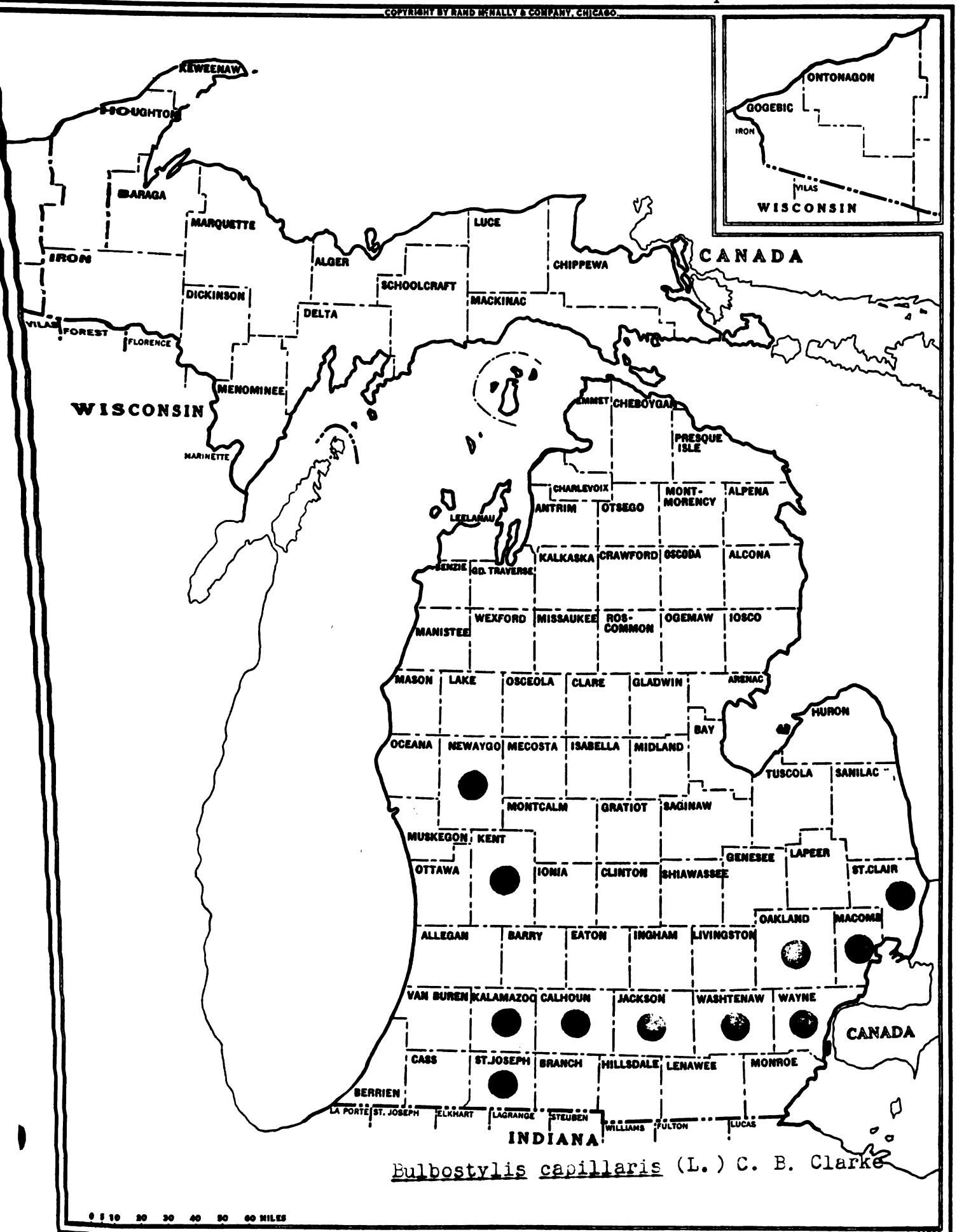


Eleocharis compressa Sull. var.
atrata Svenson

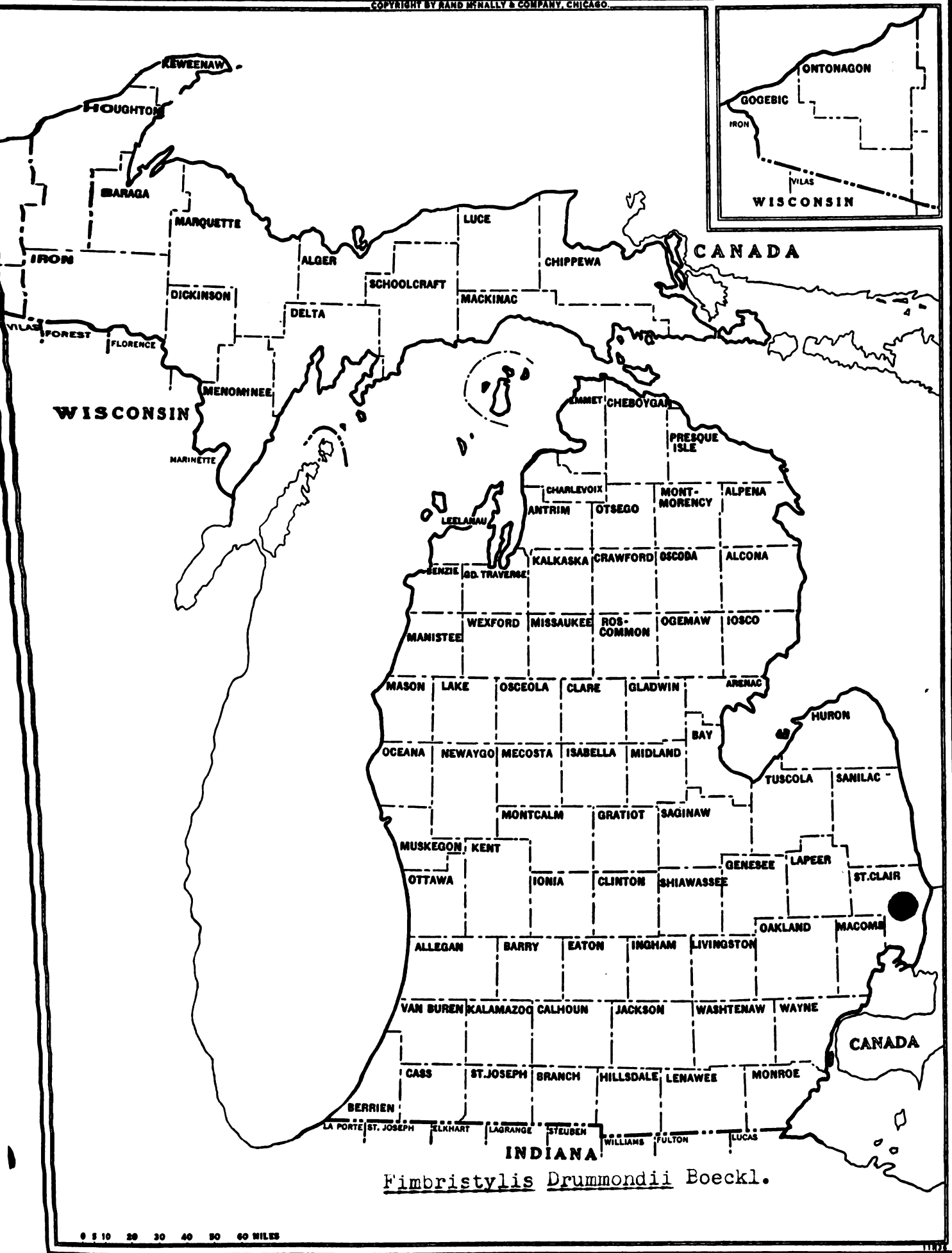




Psilocarya scirpoides Torr.

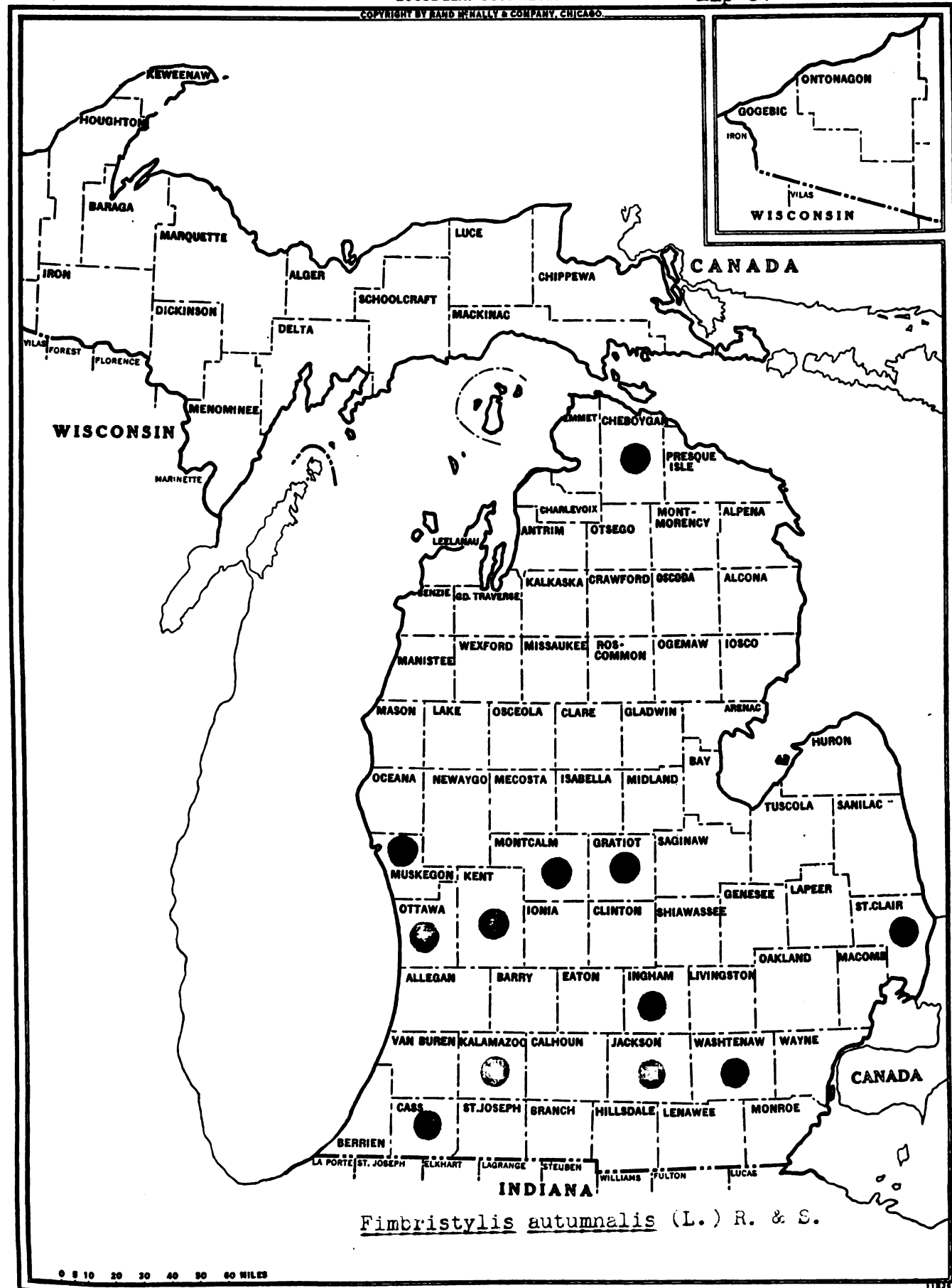


Bulbostylis capillaris (L.) C. B. Clarke

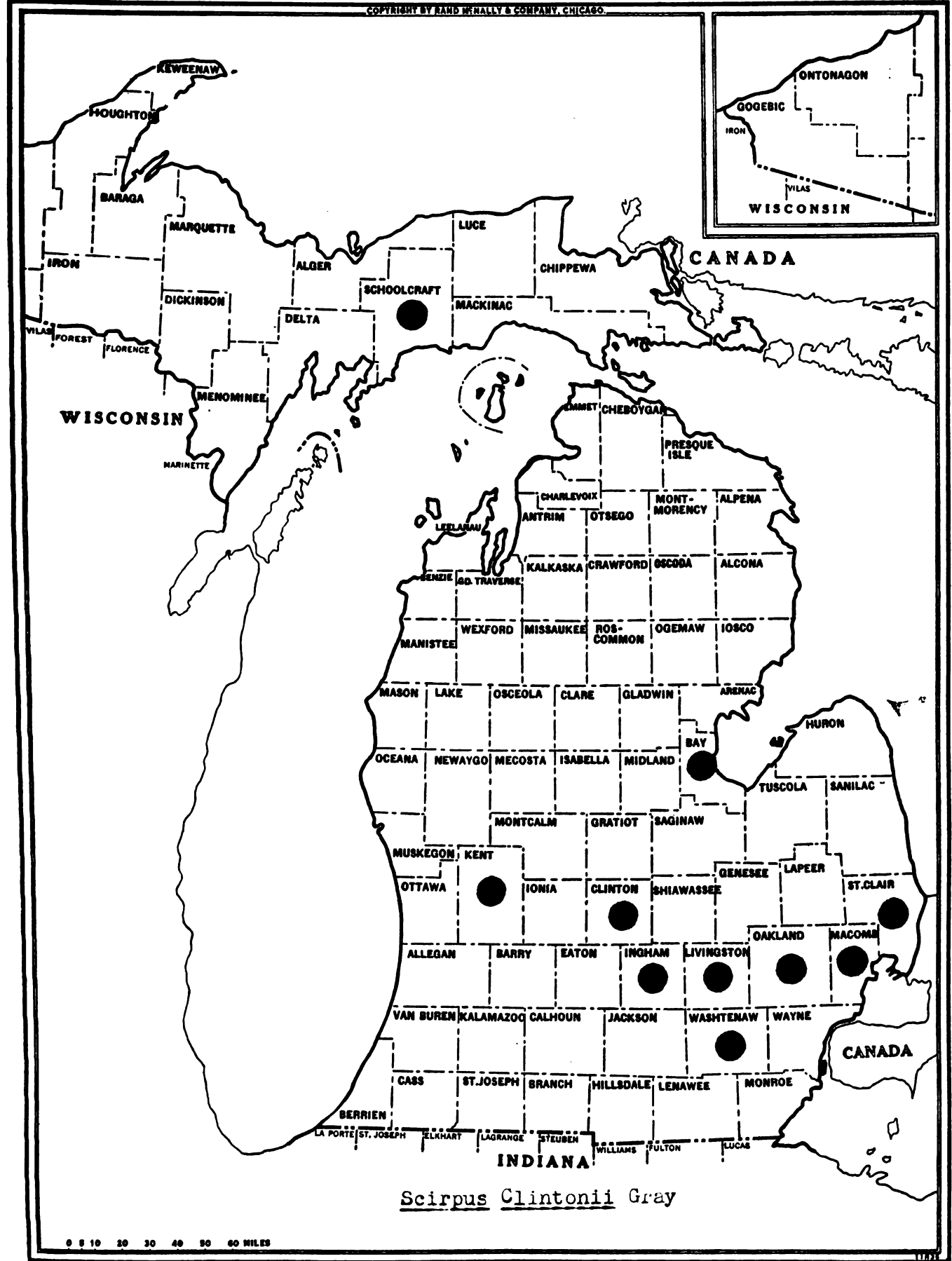


Fimbristylis Drummondii Boeckl.

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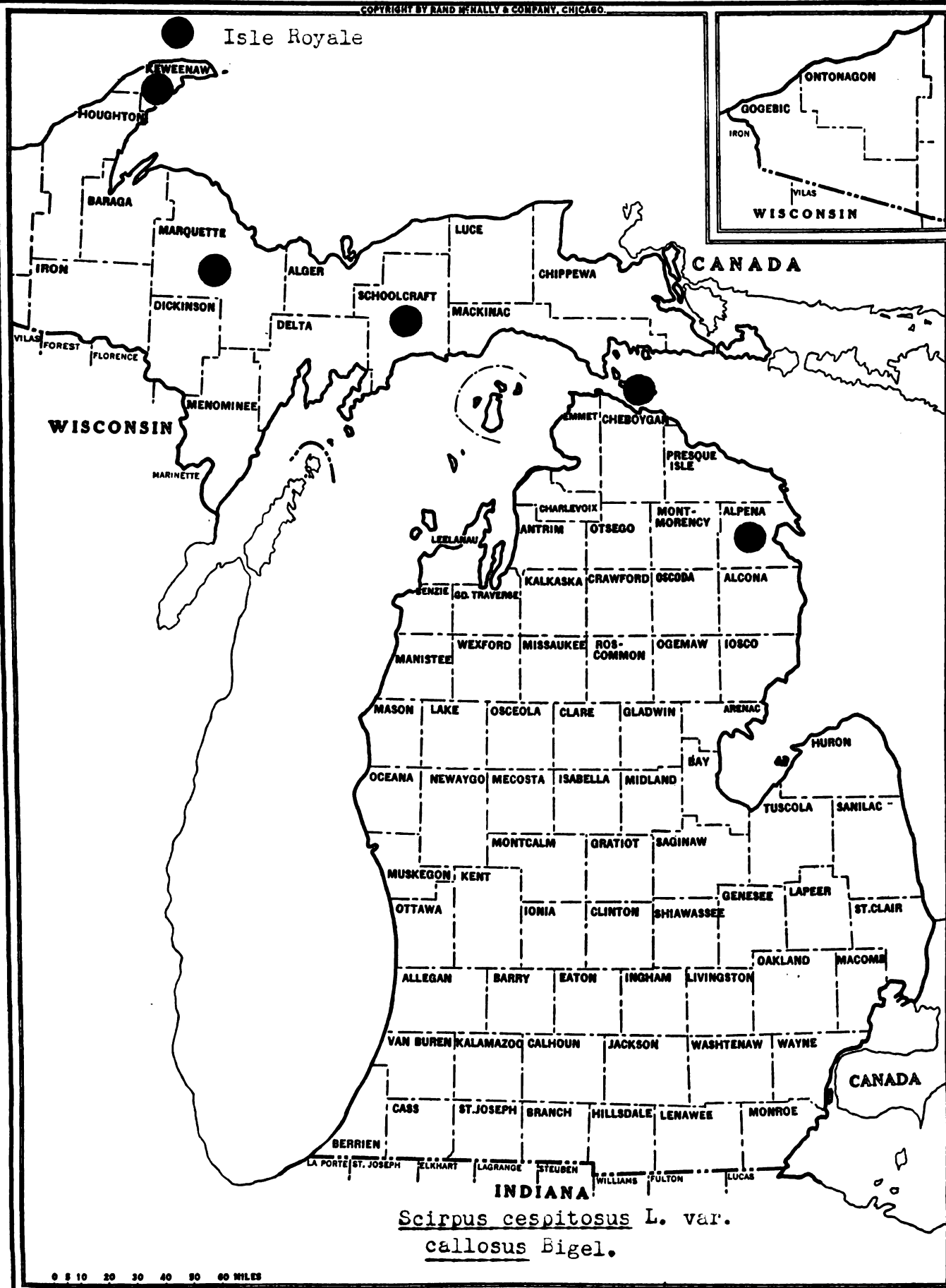


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Scirpus Clintonii Gray

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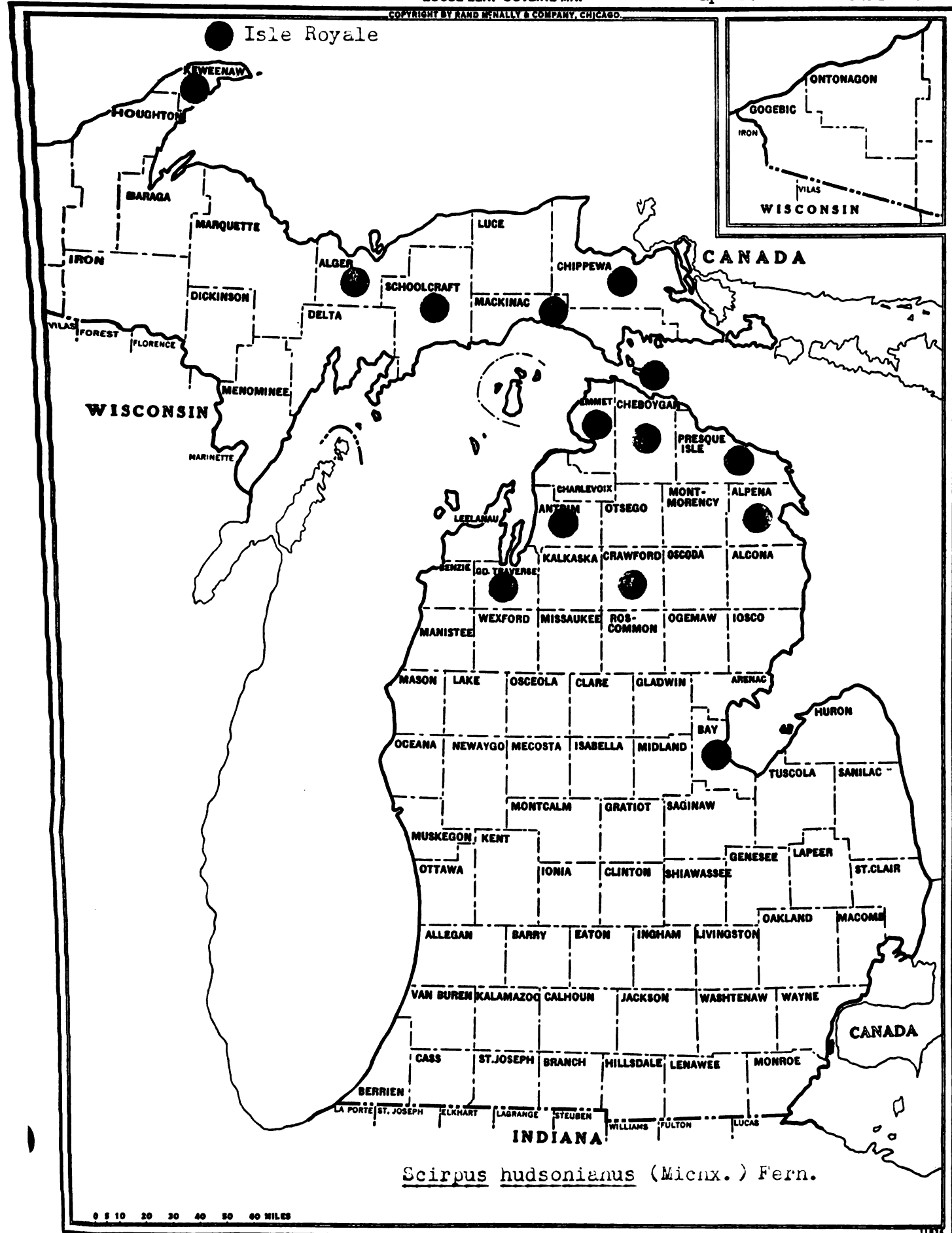


Scirpus cespitosus L. var.
callosus Bigel.

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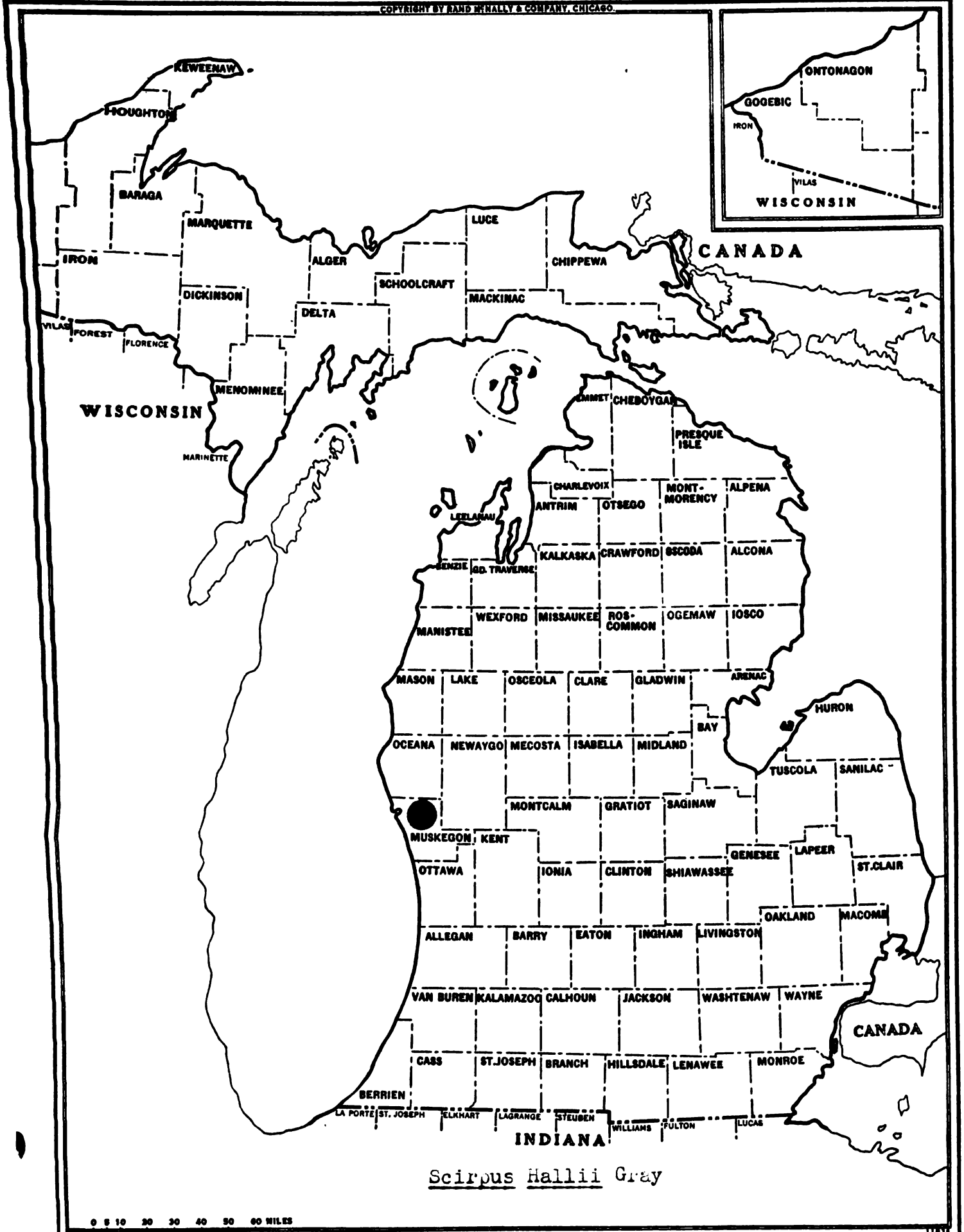


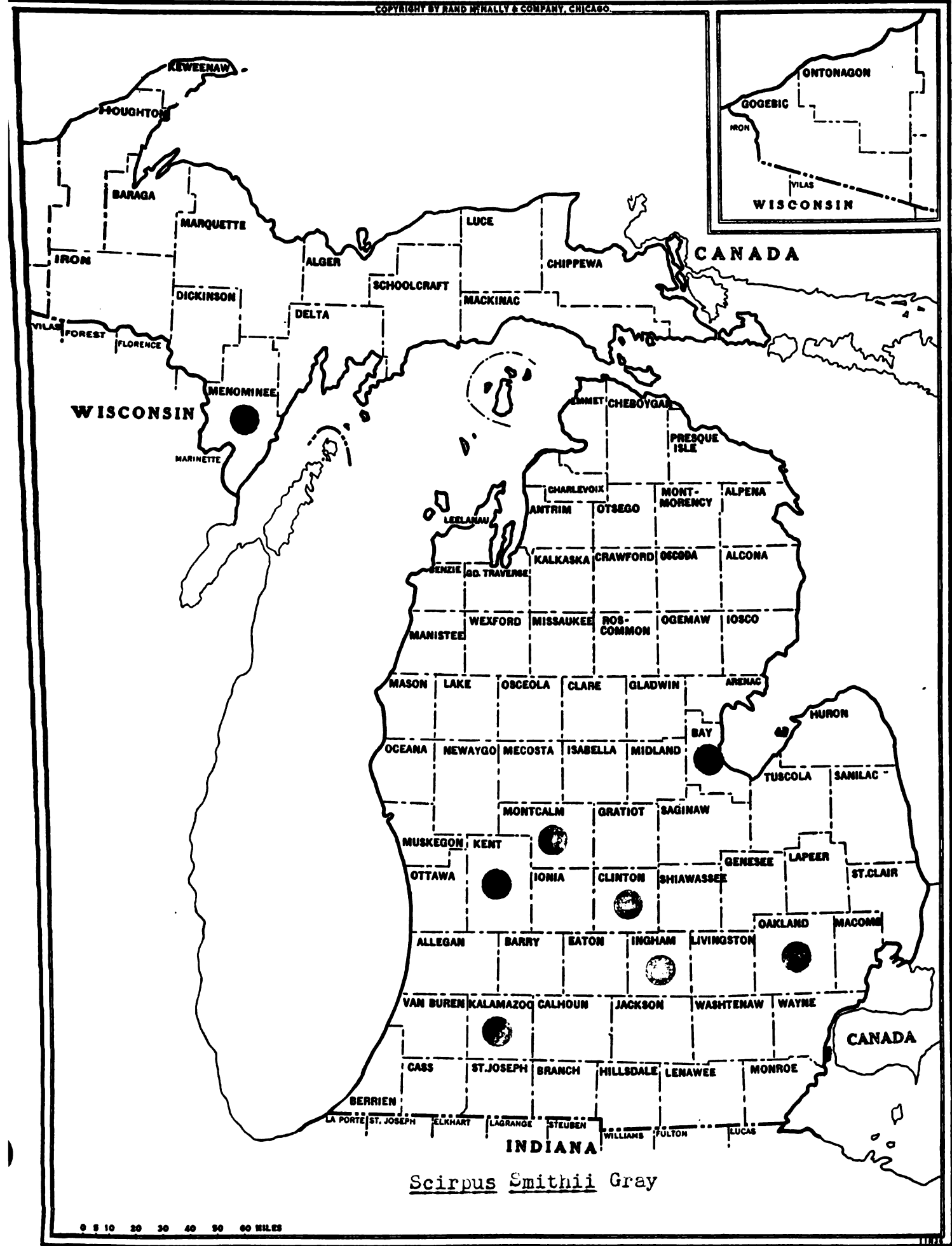
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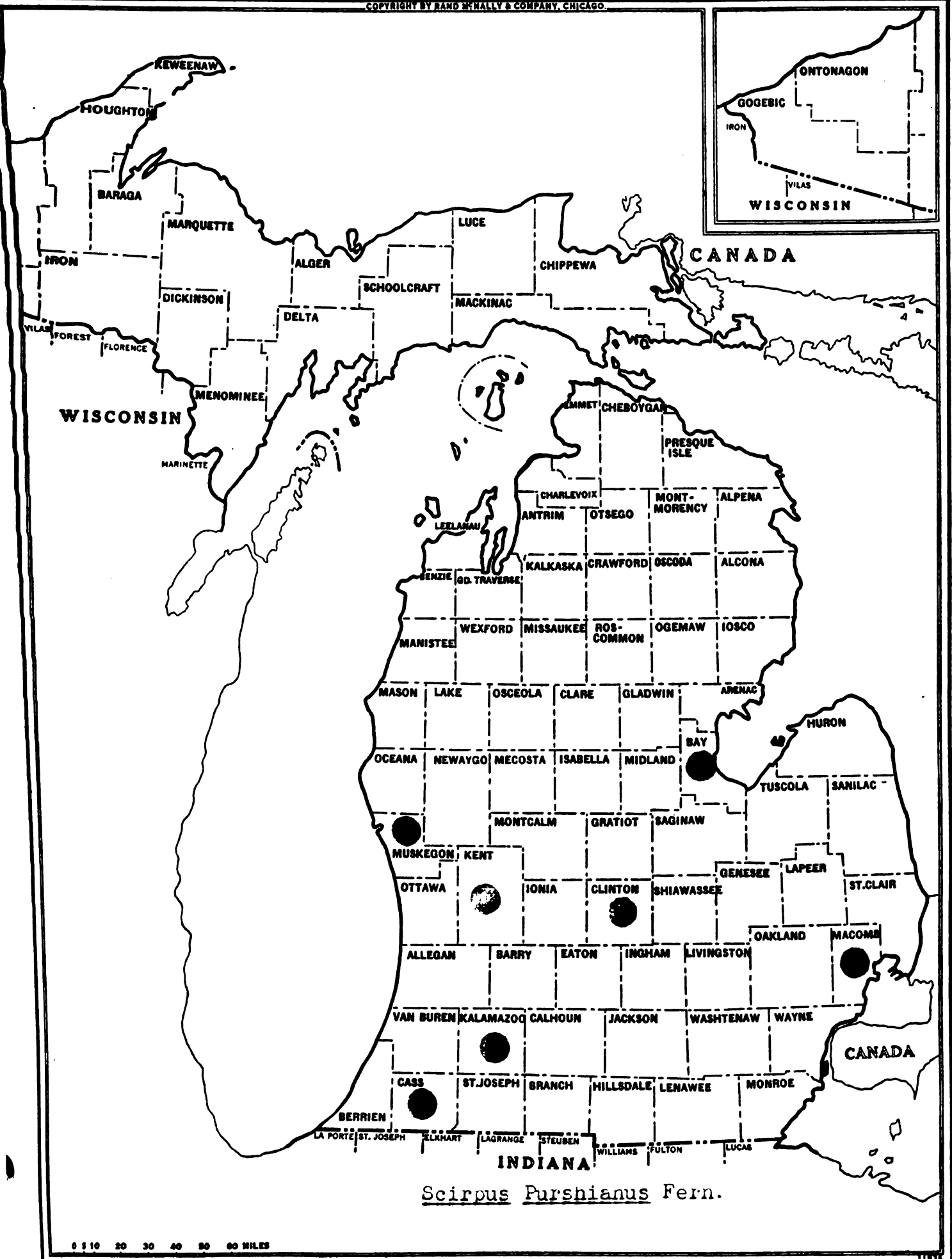
Scirpus hudsonianus (Michx.) Fern.

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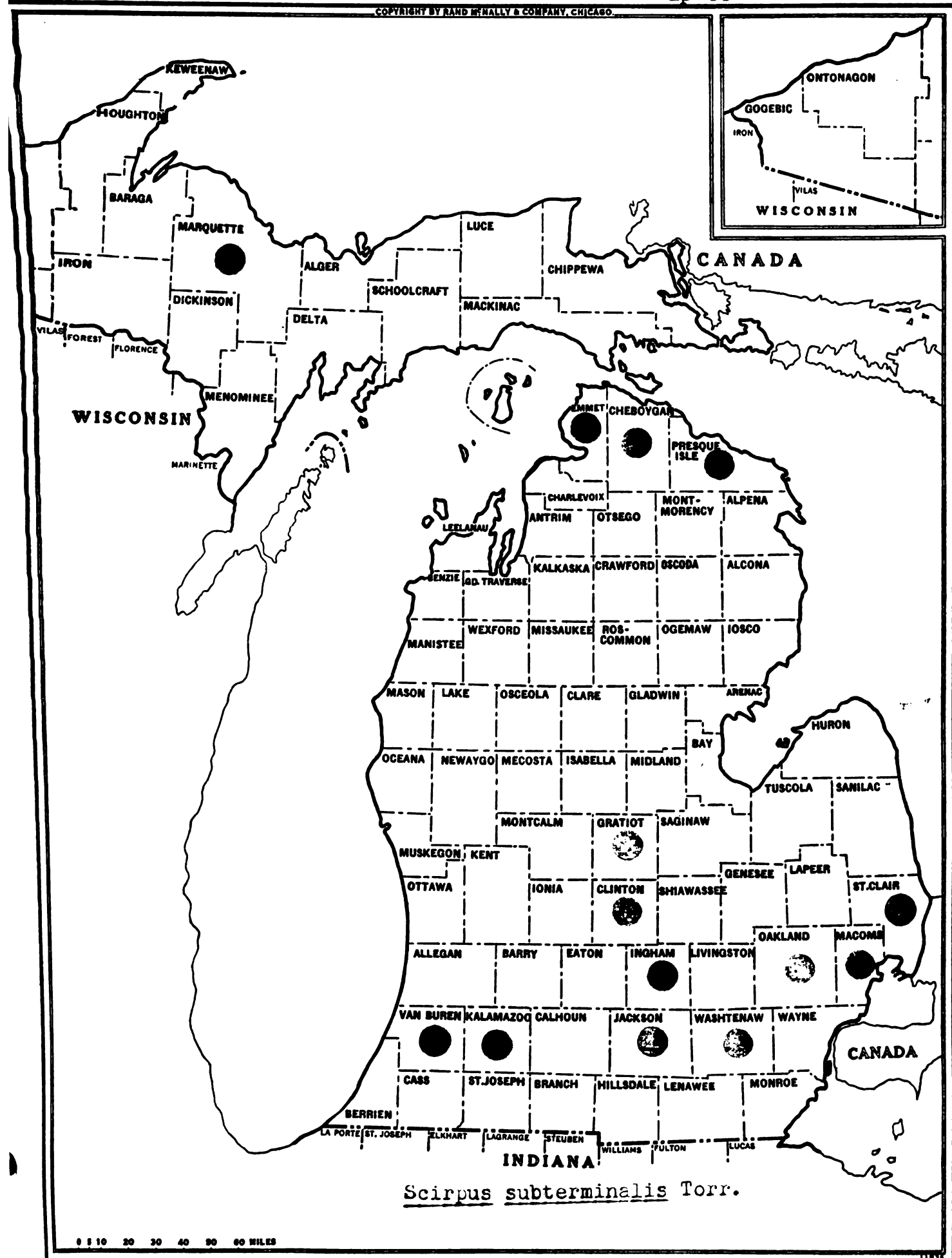


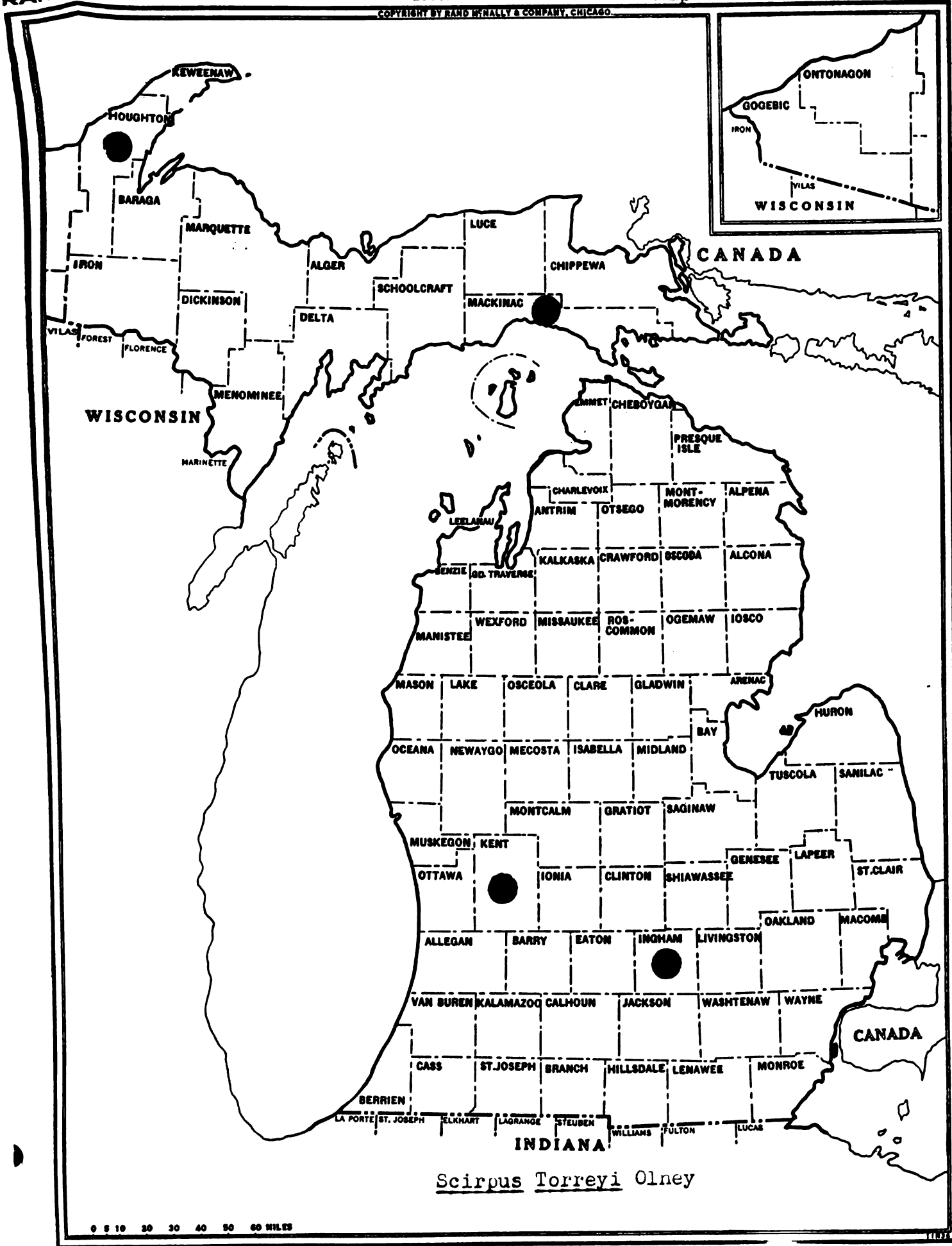


Scirpus Smithii Gray



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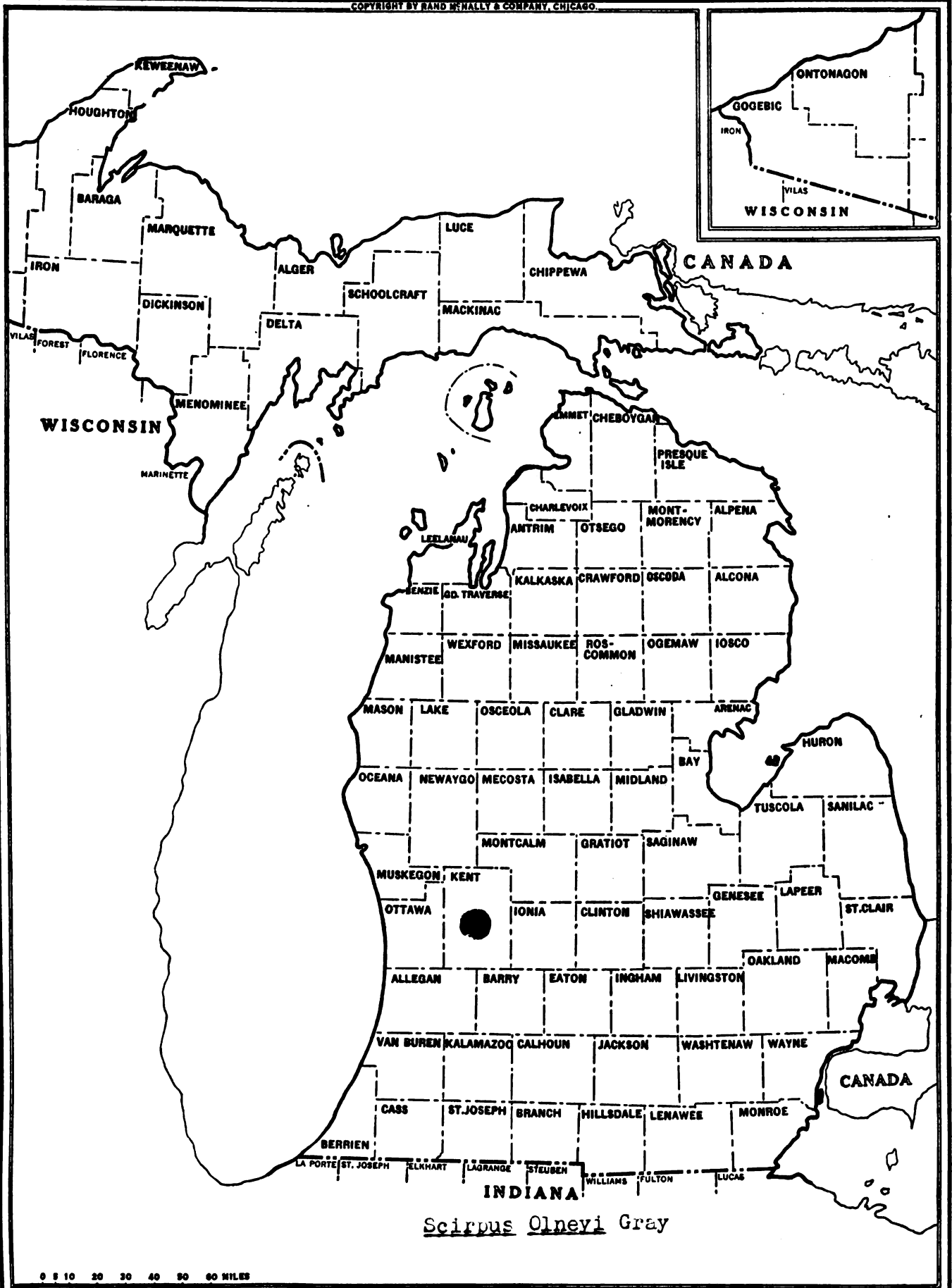


Scirpus Torreyi Olney

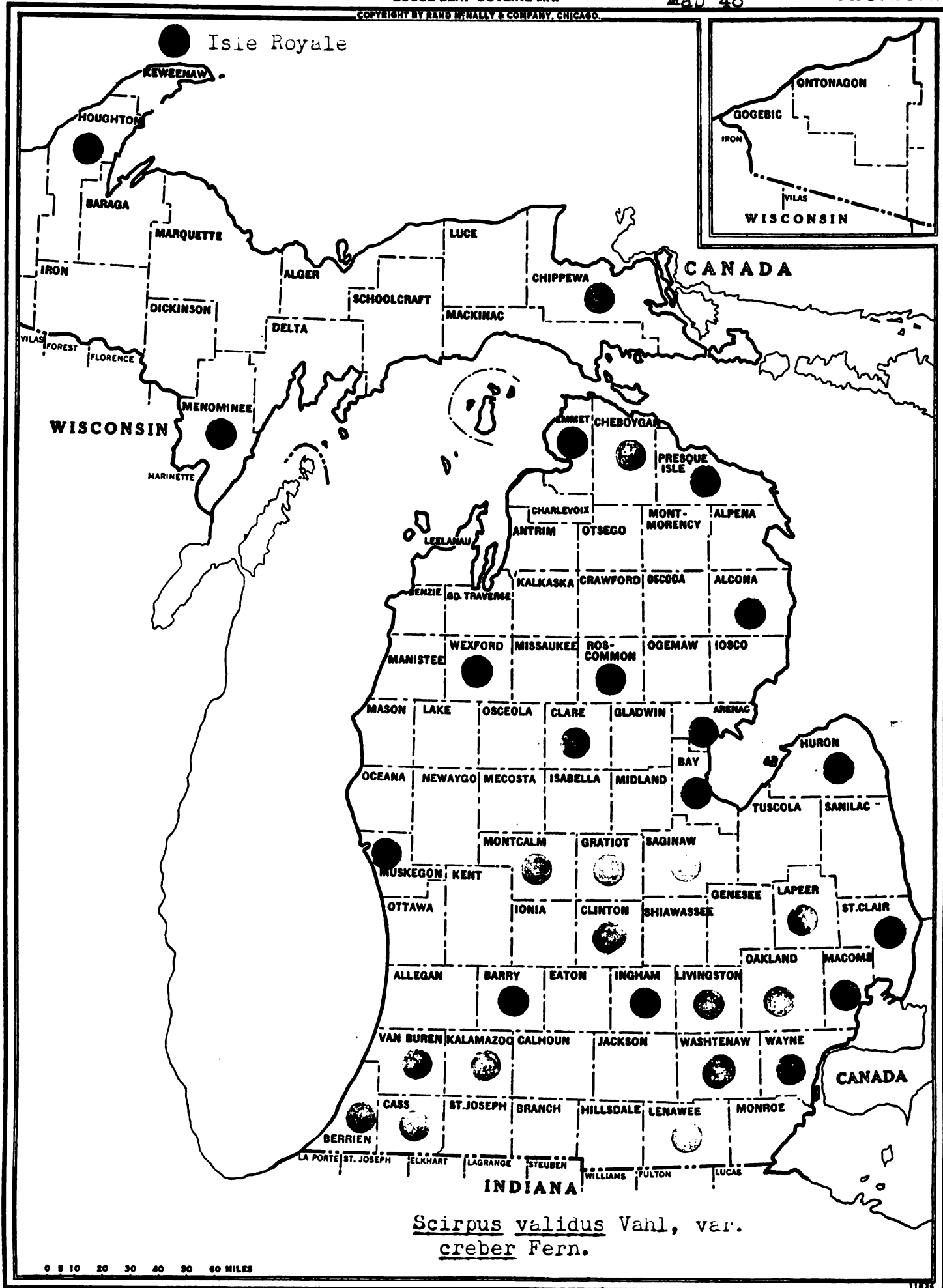
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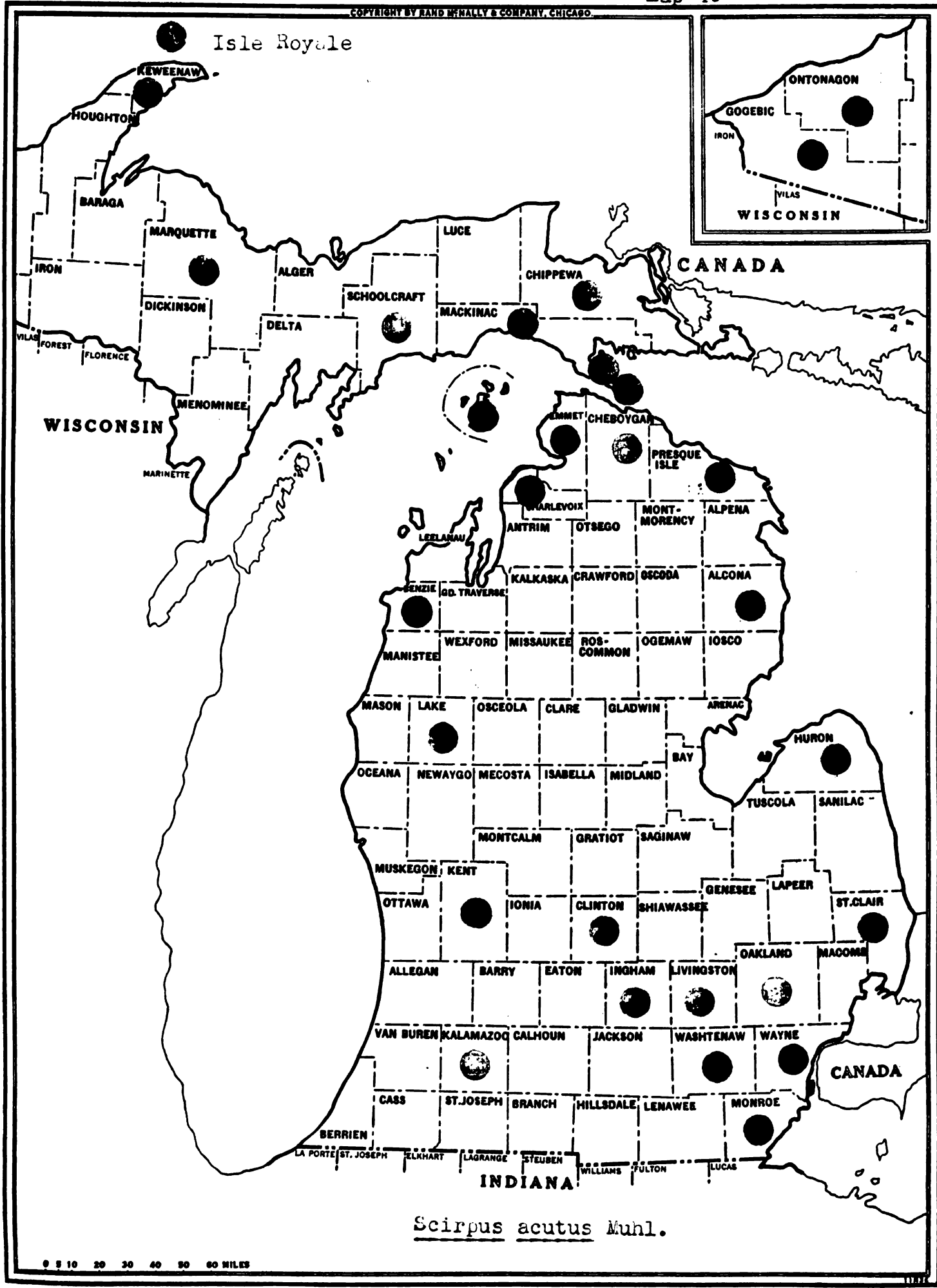


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Scirpus validus Vahl, var.
creber Fern.

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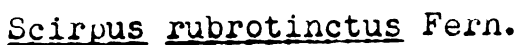
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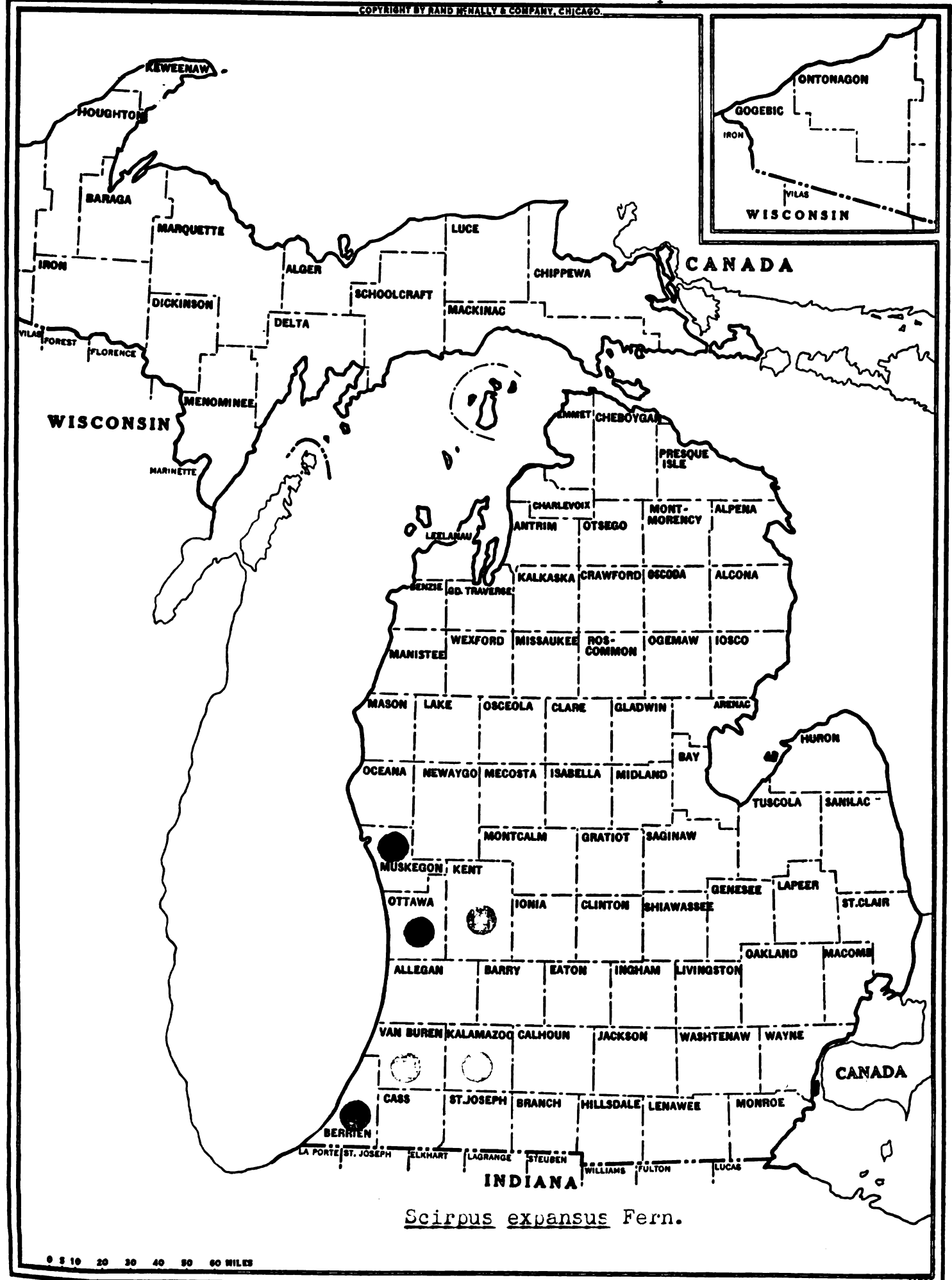


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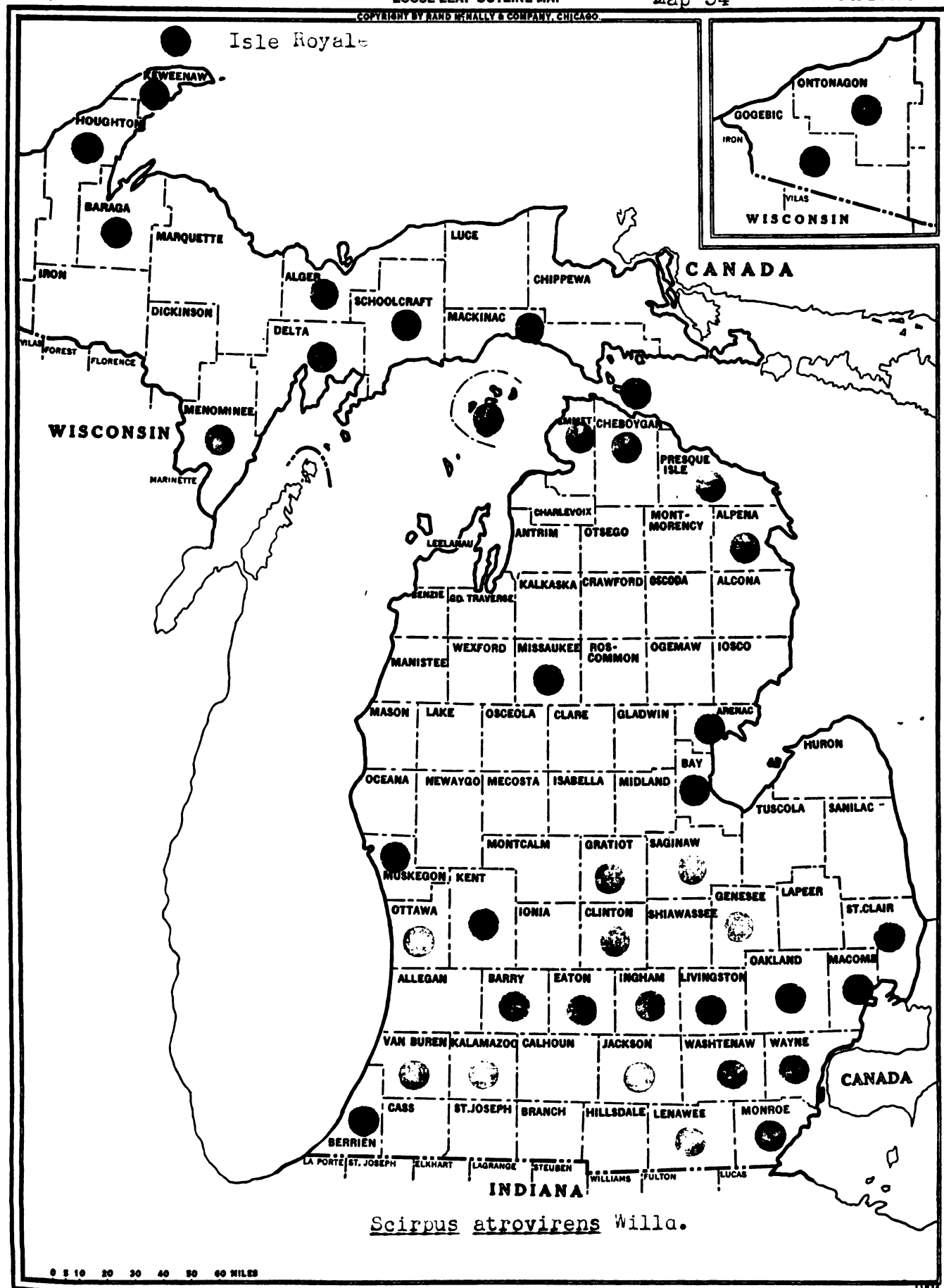


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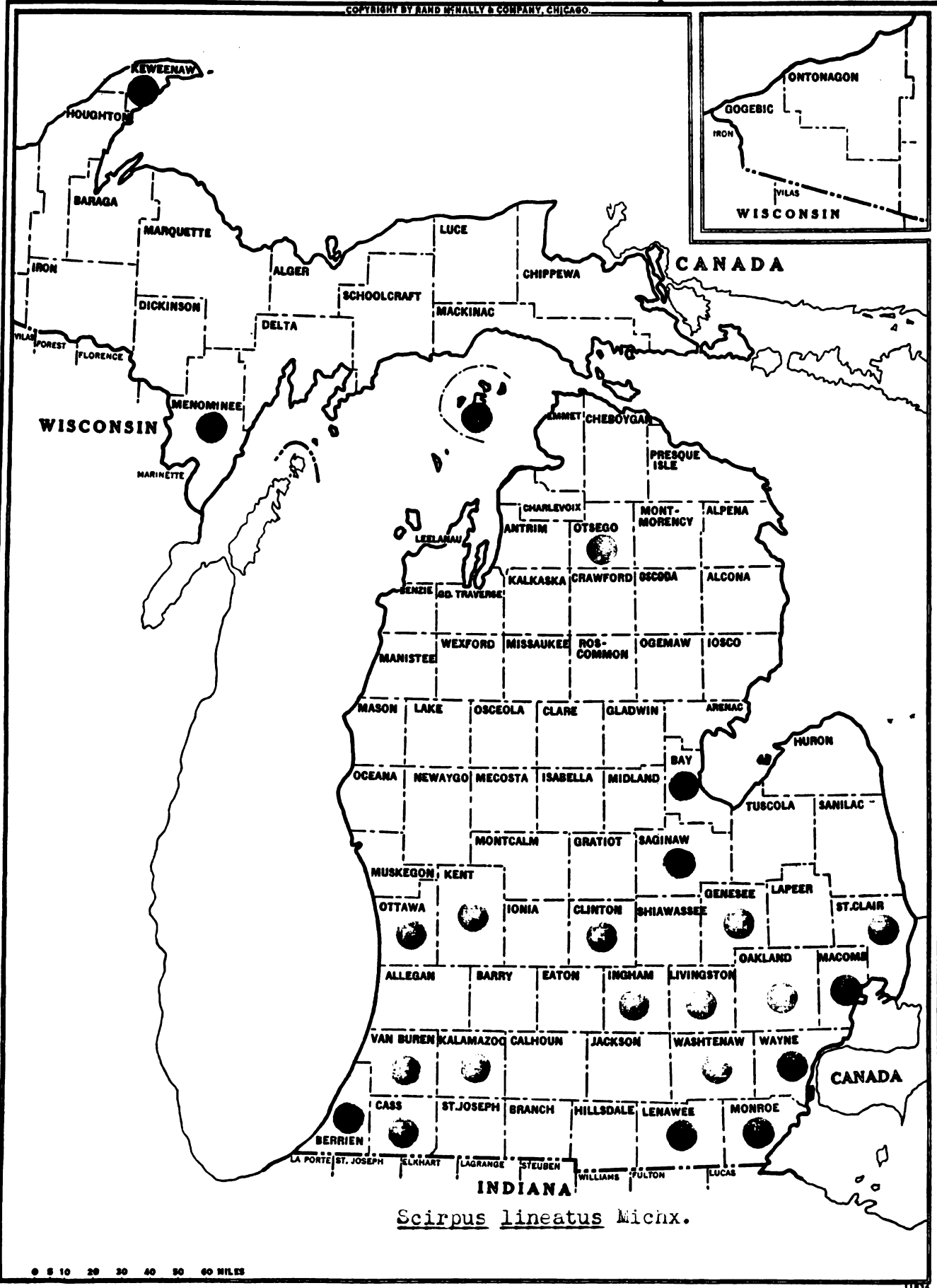
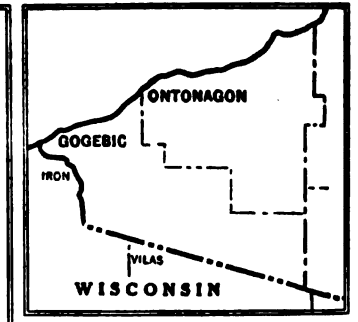




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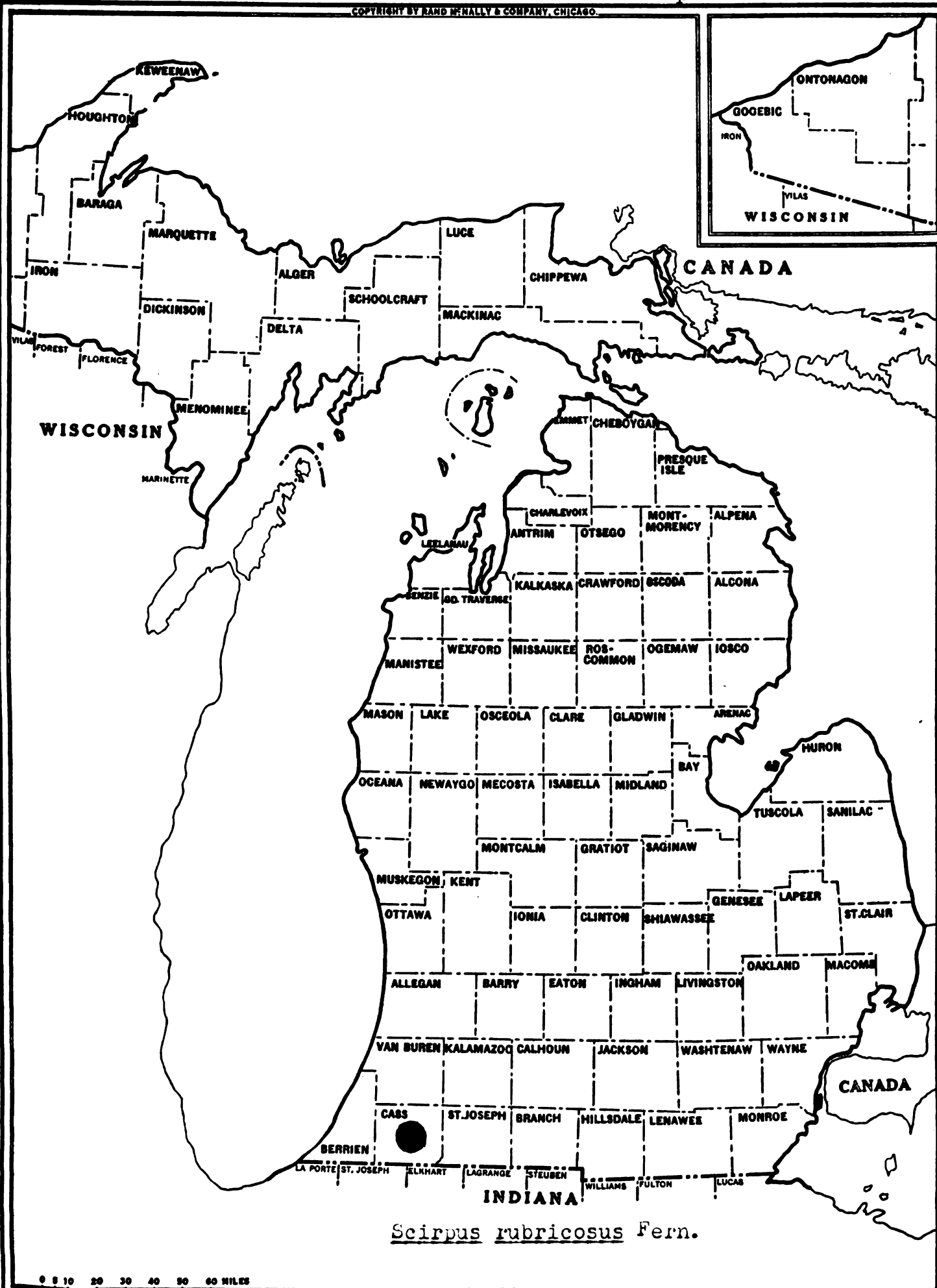
Scirpus lineatus Michx.

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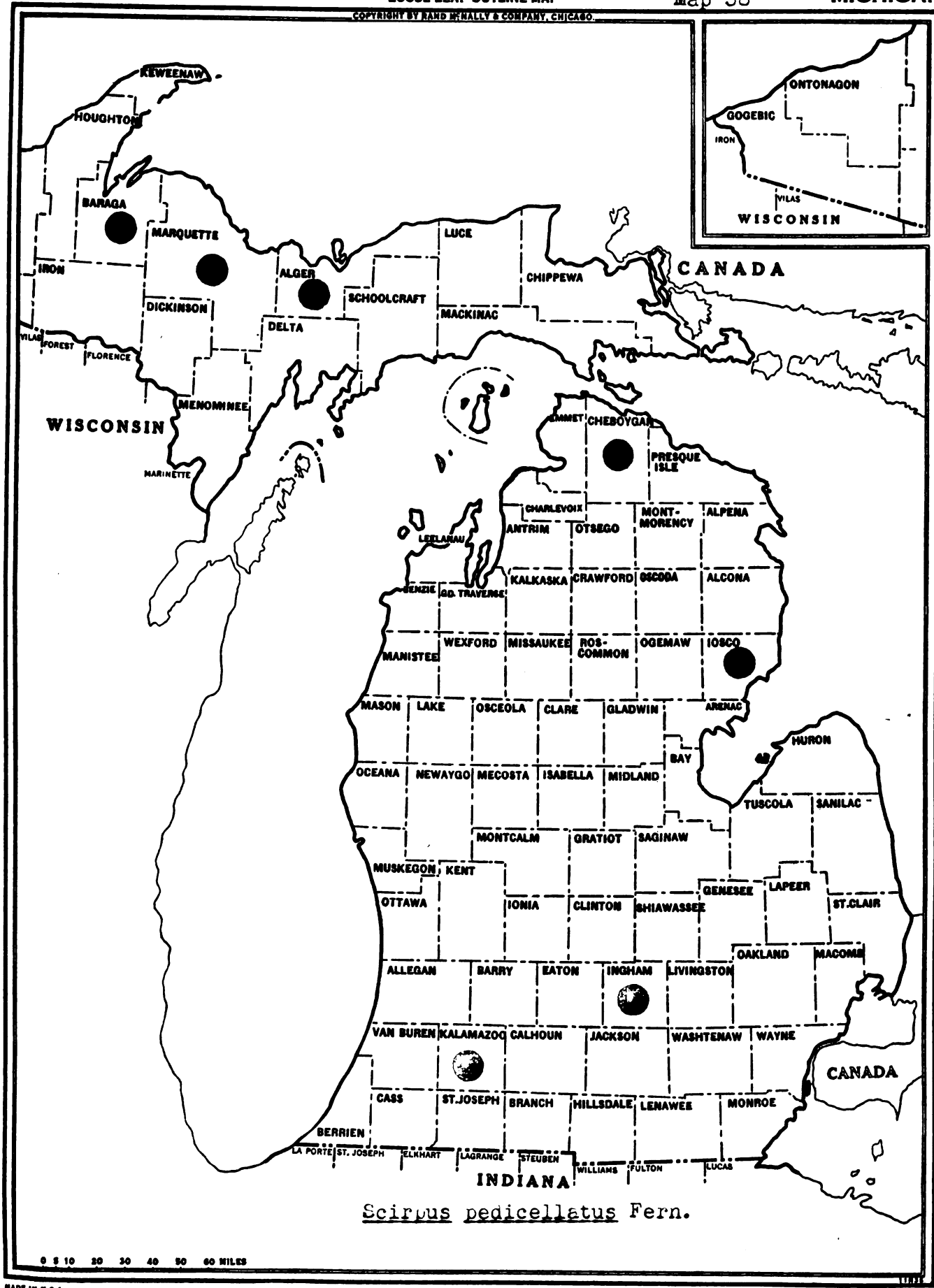
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Scirpus rubricosus Fern.

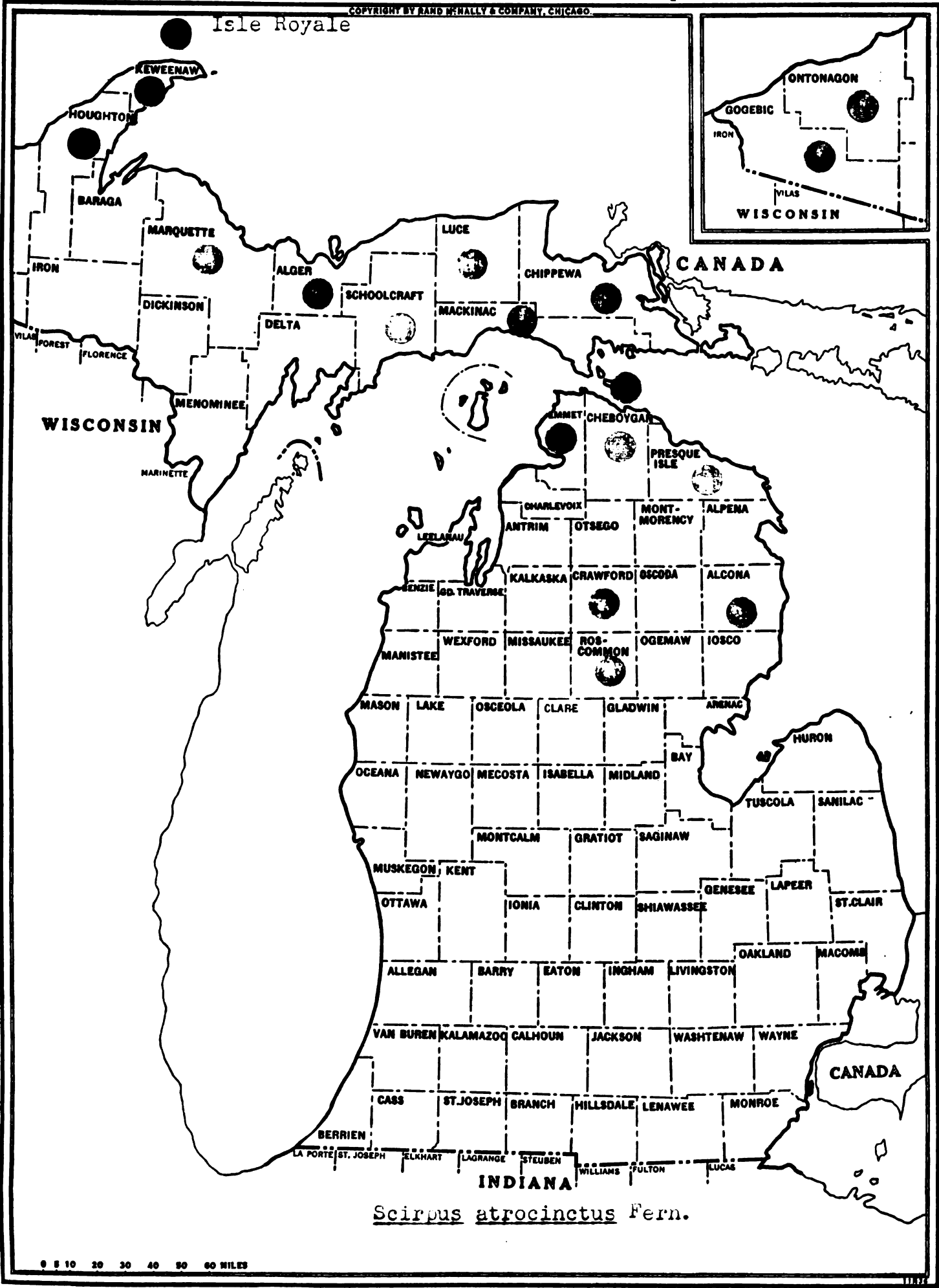


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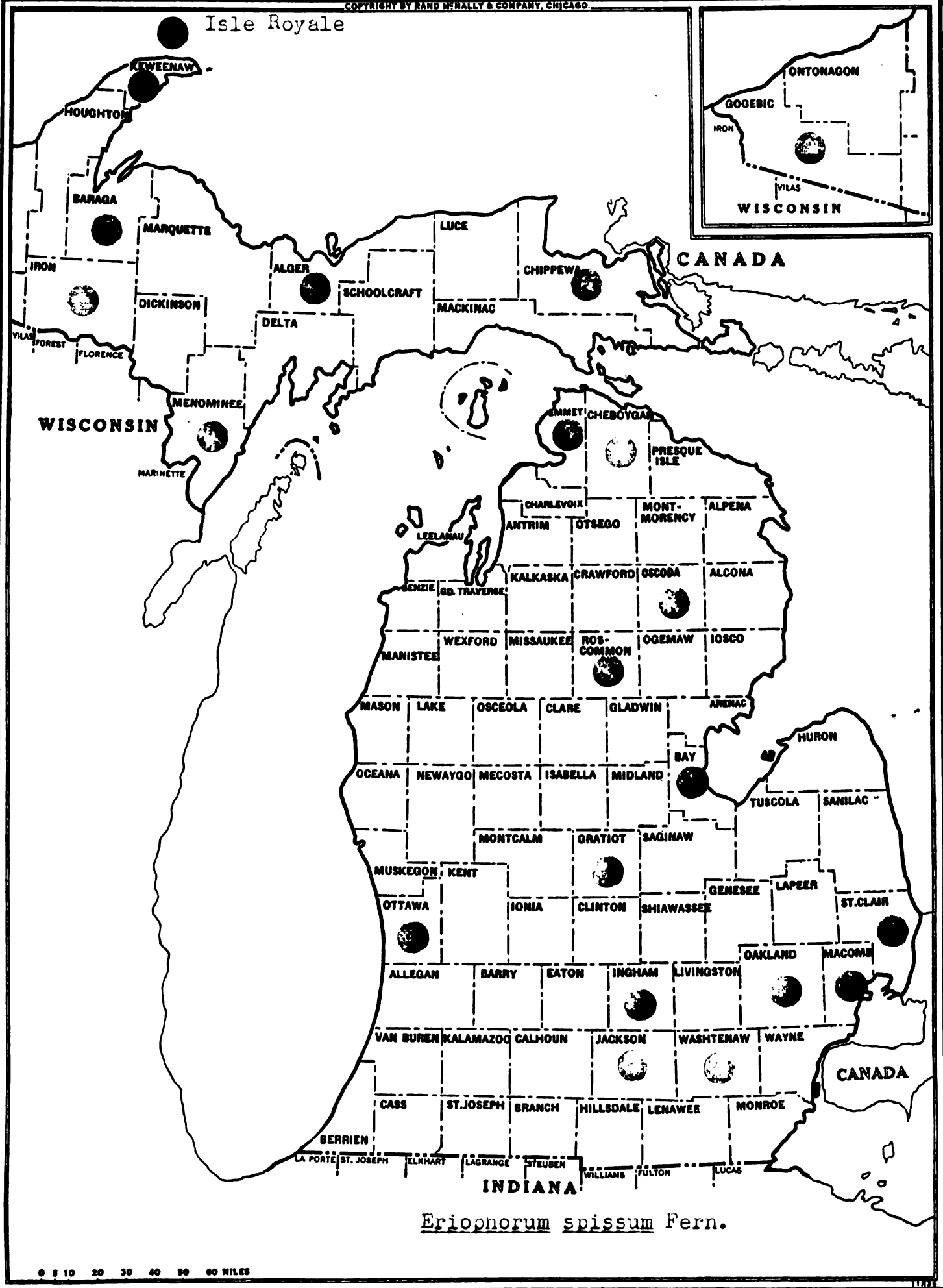


Scirpus pedicellatus Fern.

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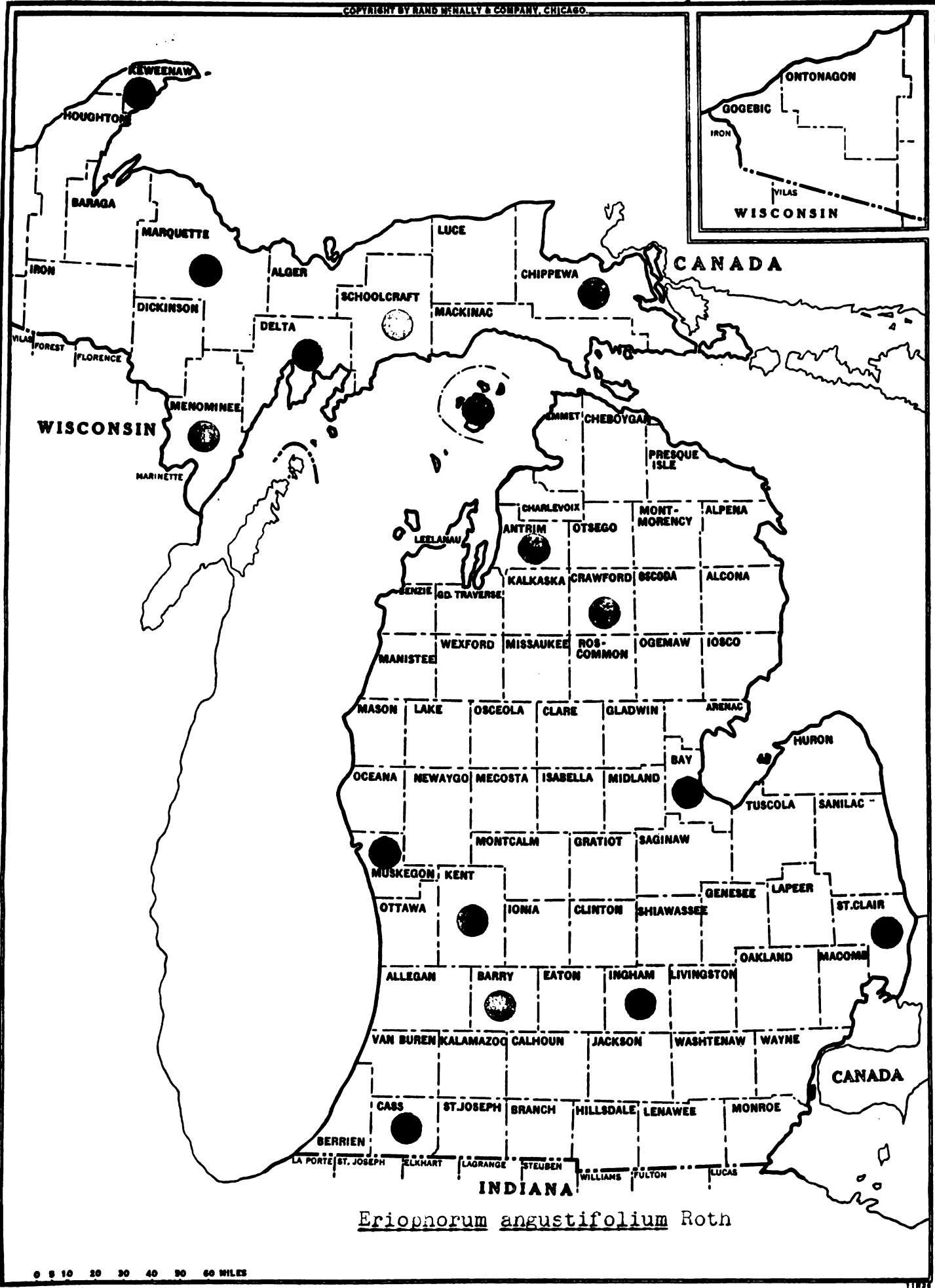


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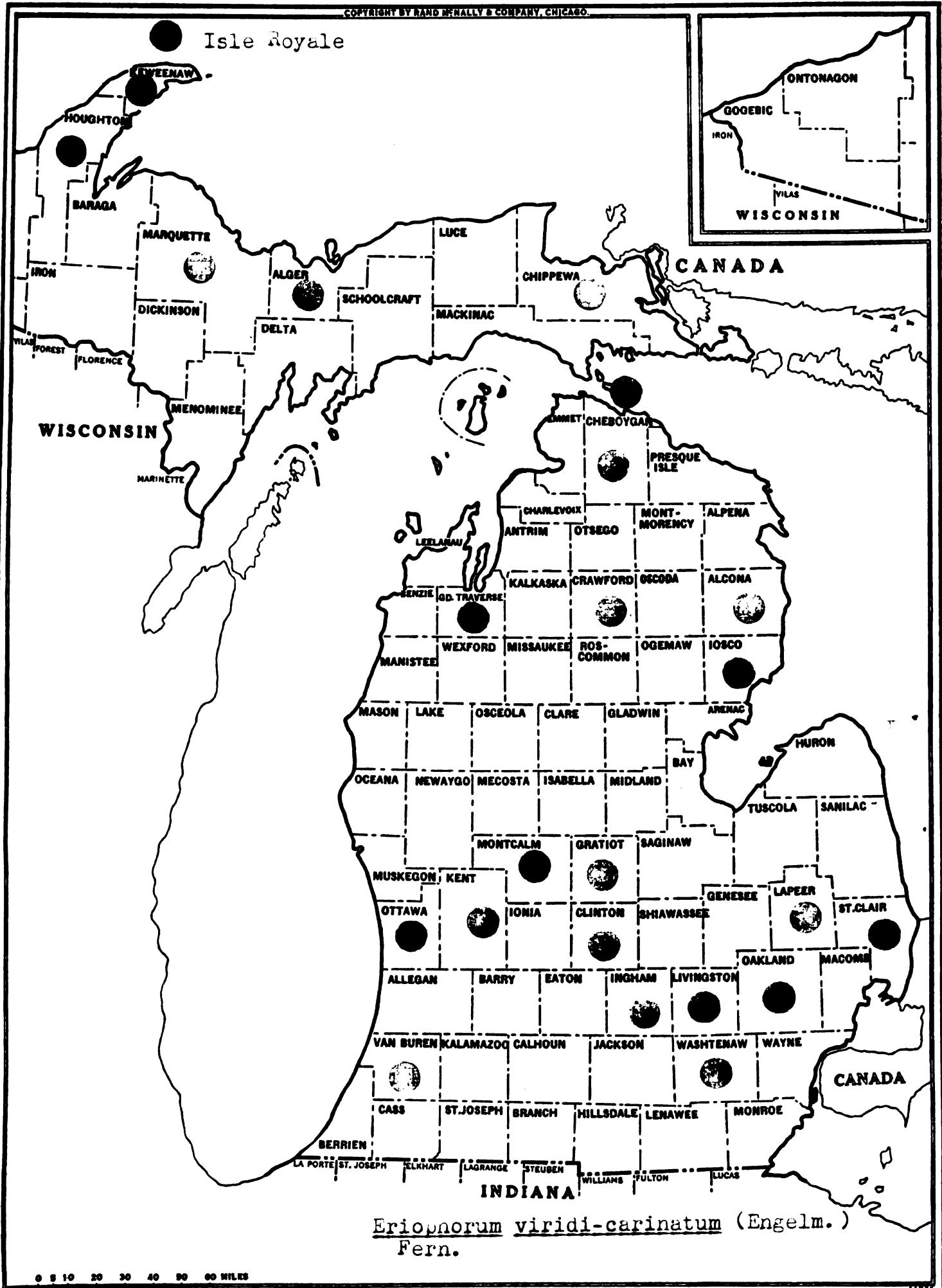
Eriophorum spissum Fern.

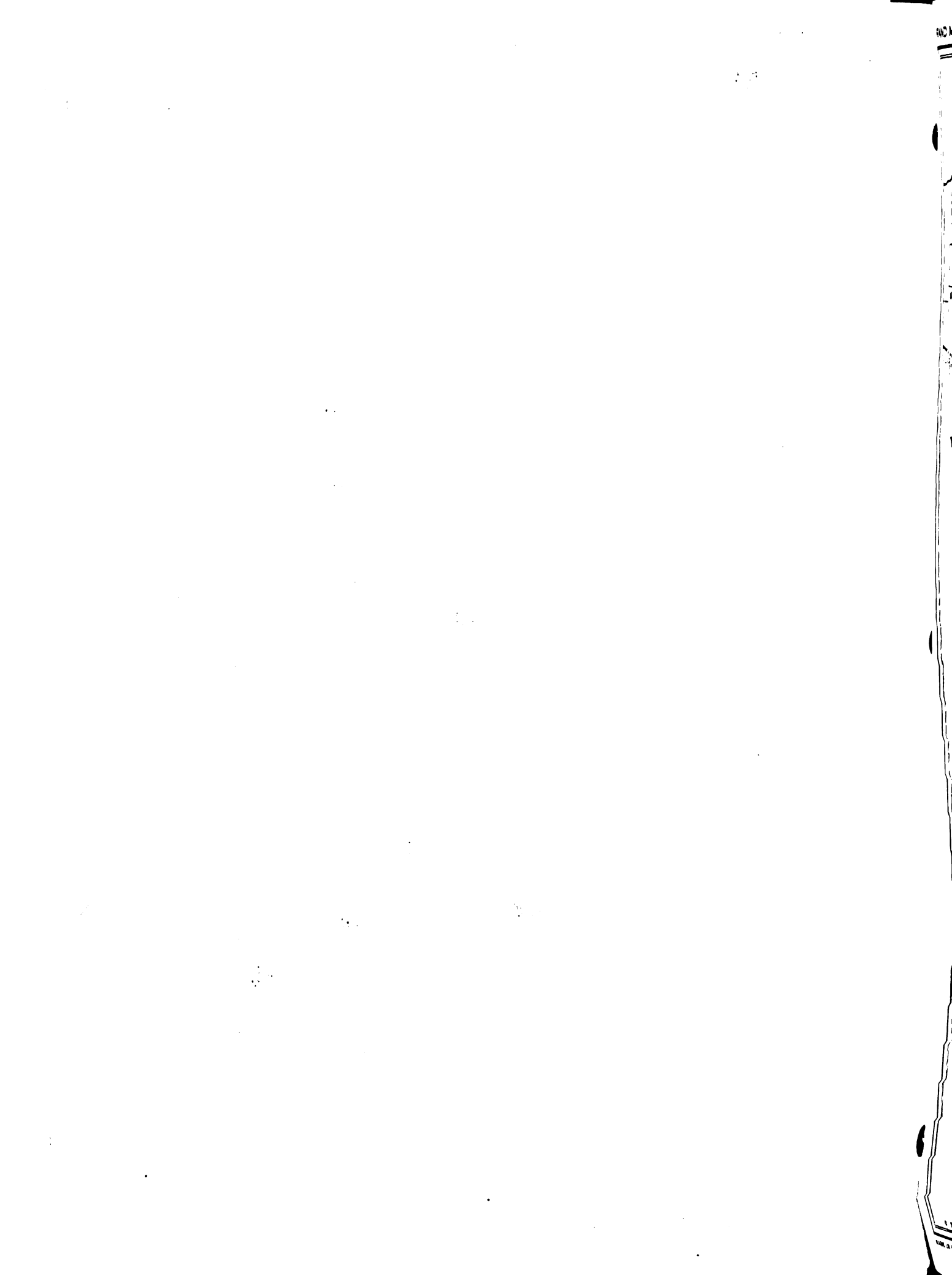




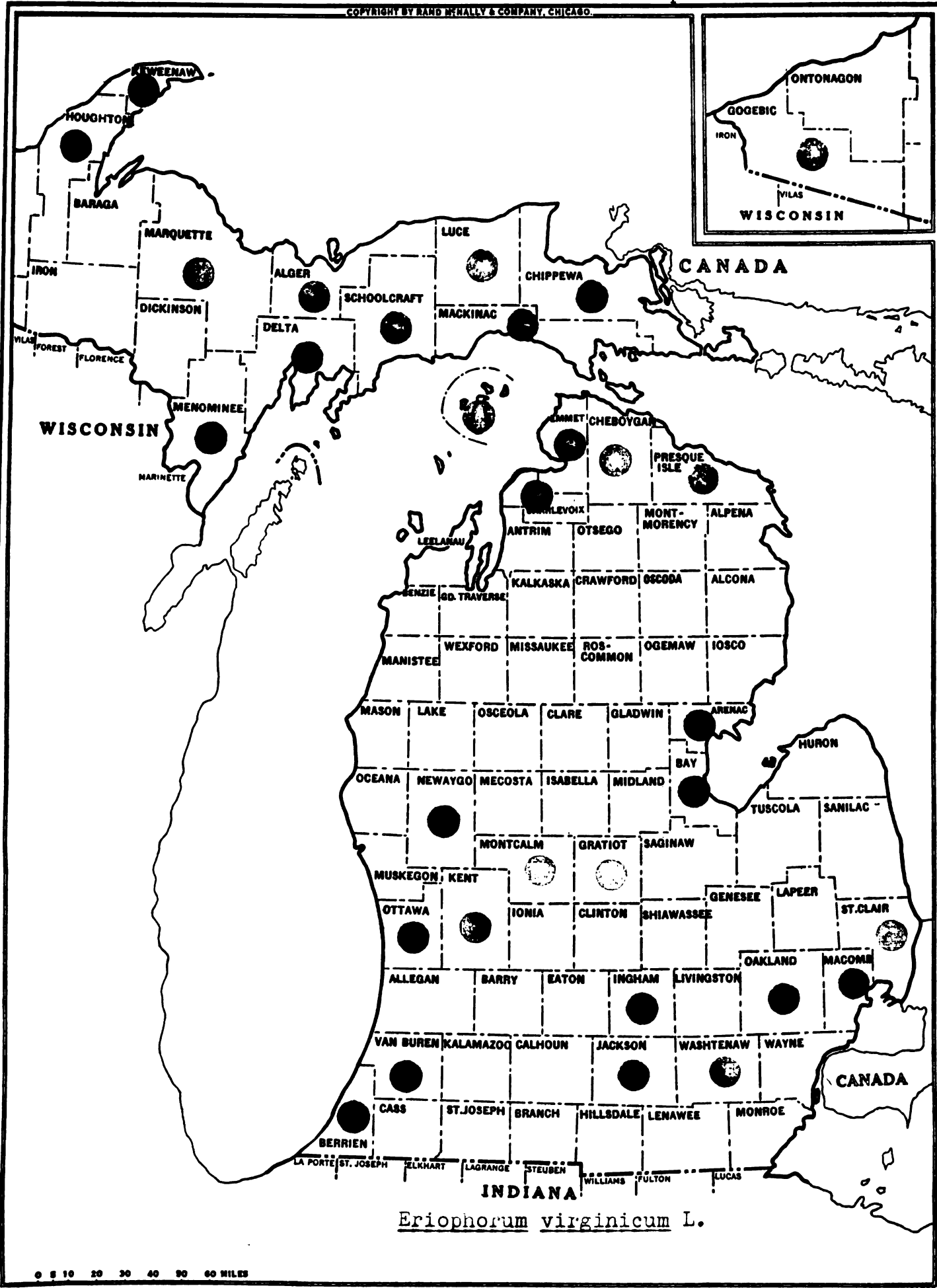
Eriophorum angustifolium Roth

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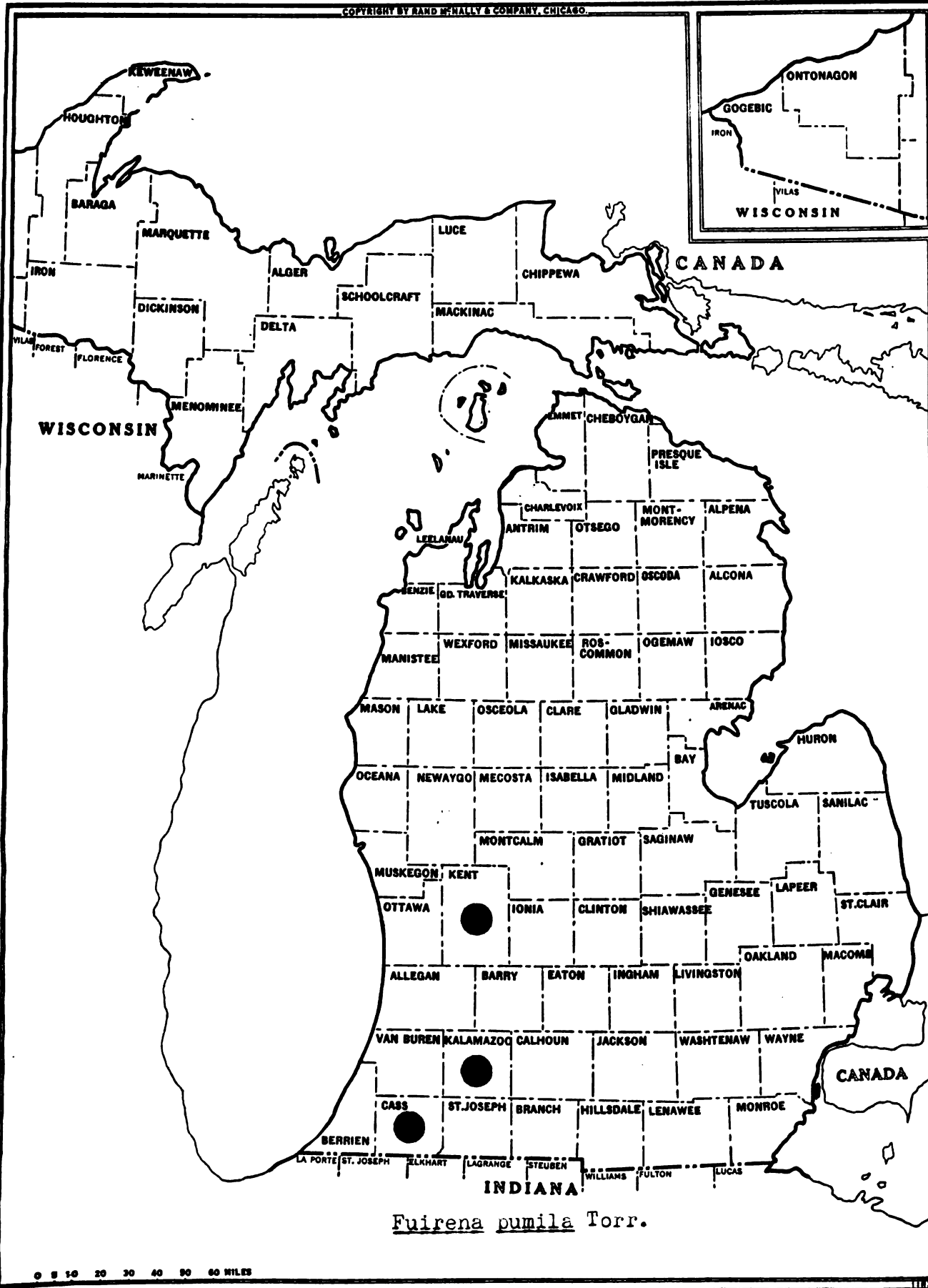
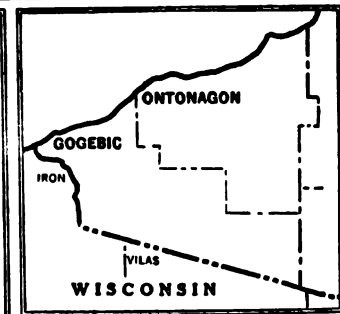


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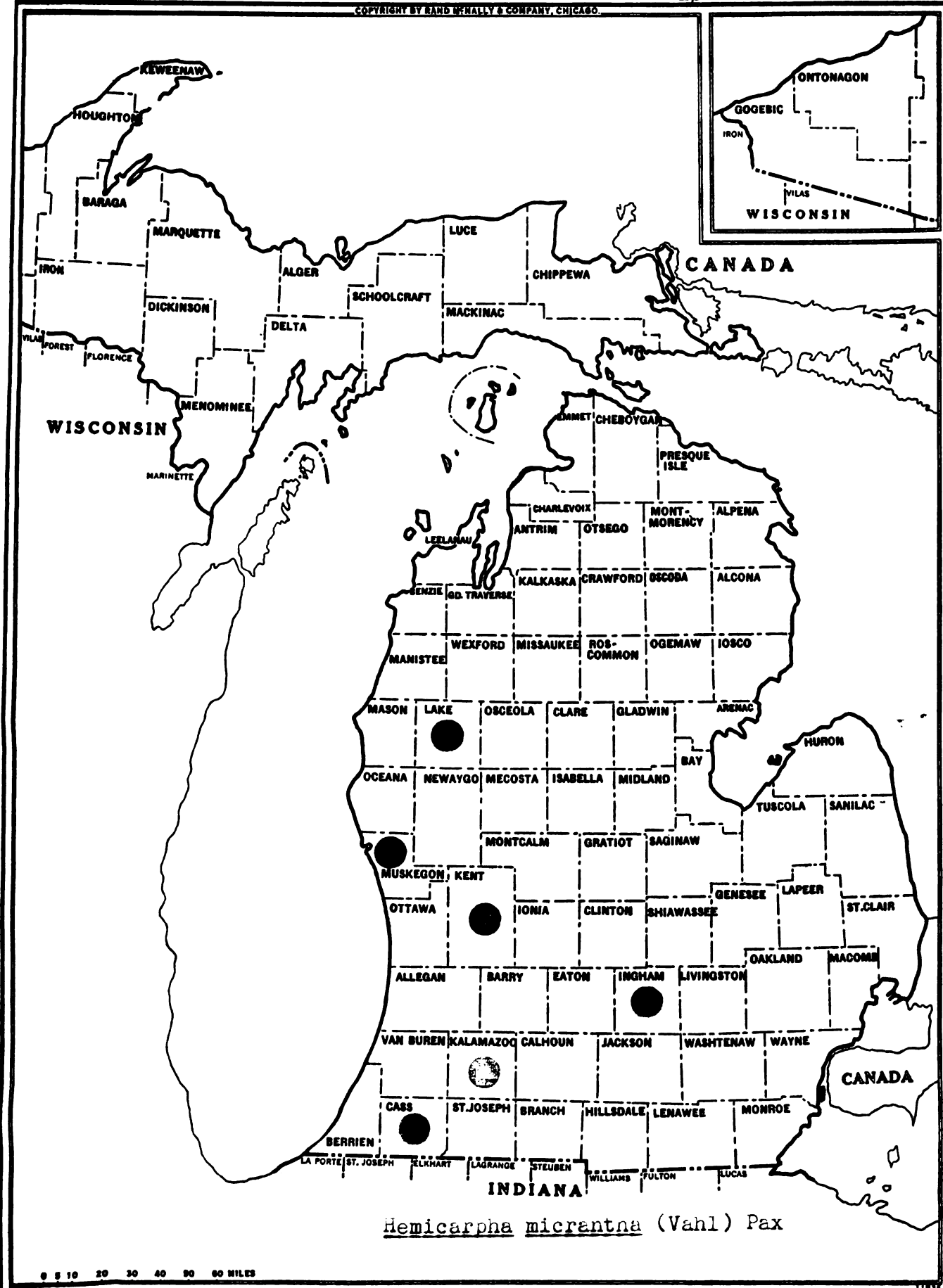
Eriophorum virginicum L.

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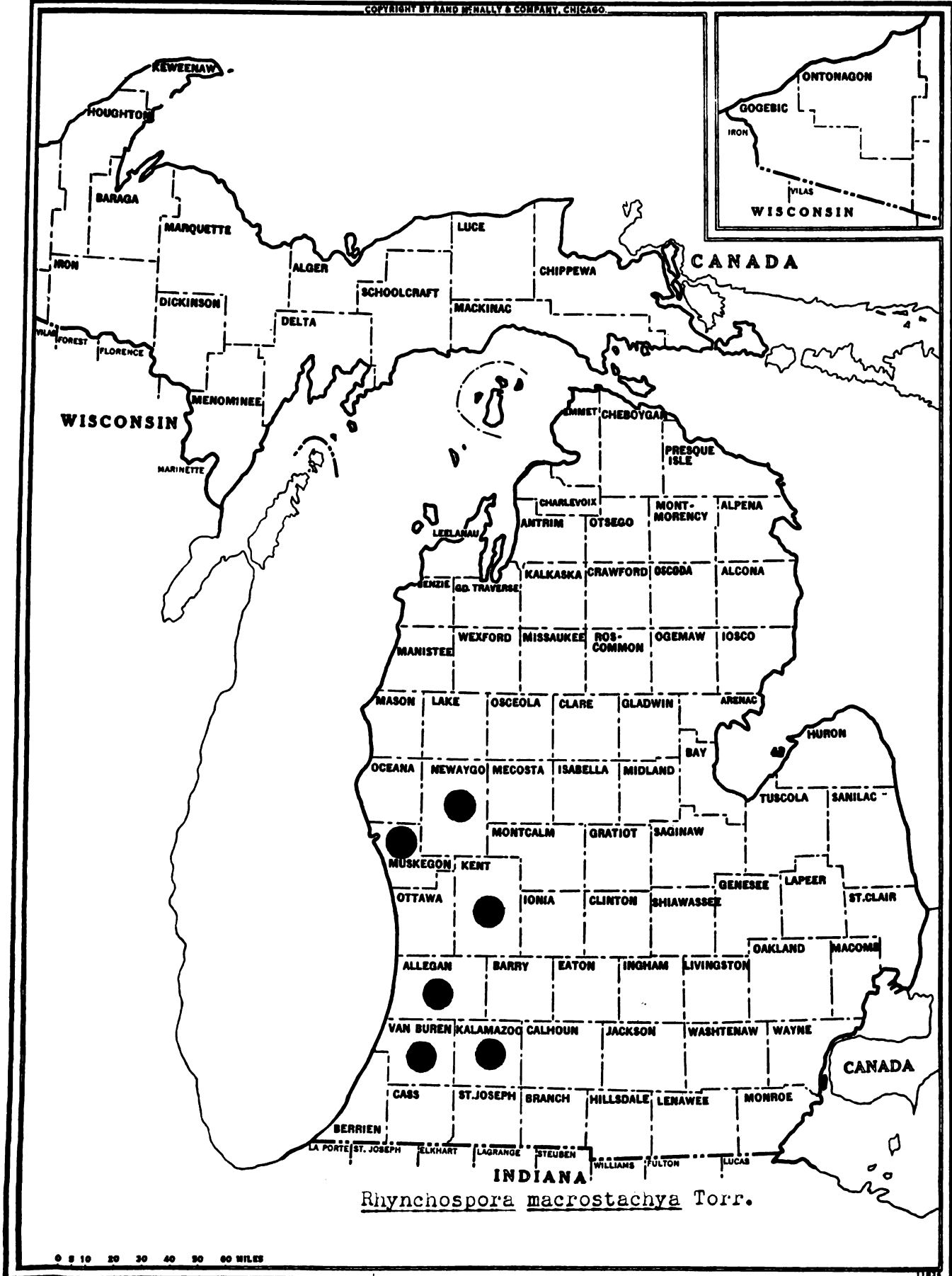


Fuirena pumila Torr.

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Hemicarpha micrantha (Vahl) Pax

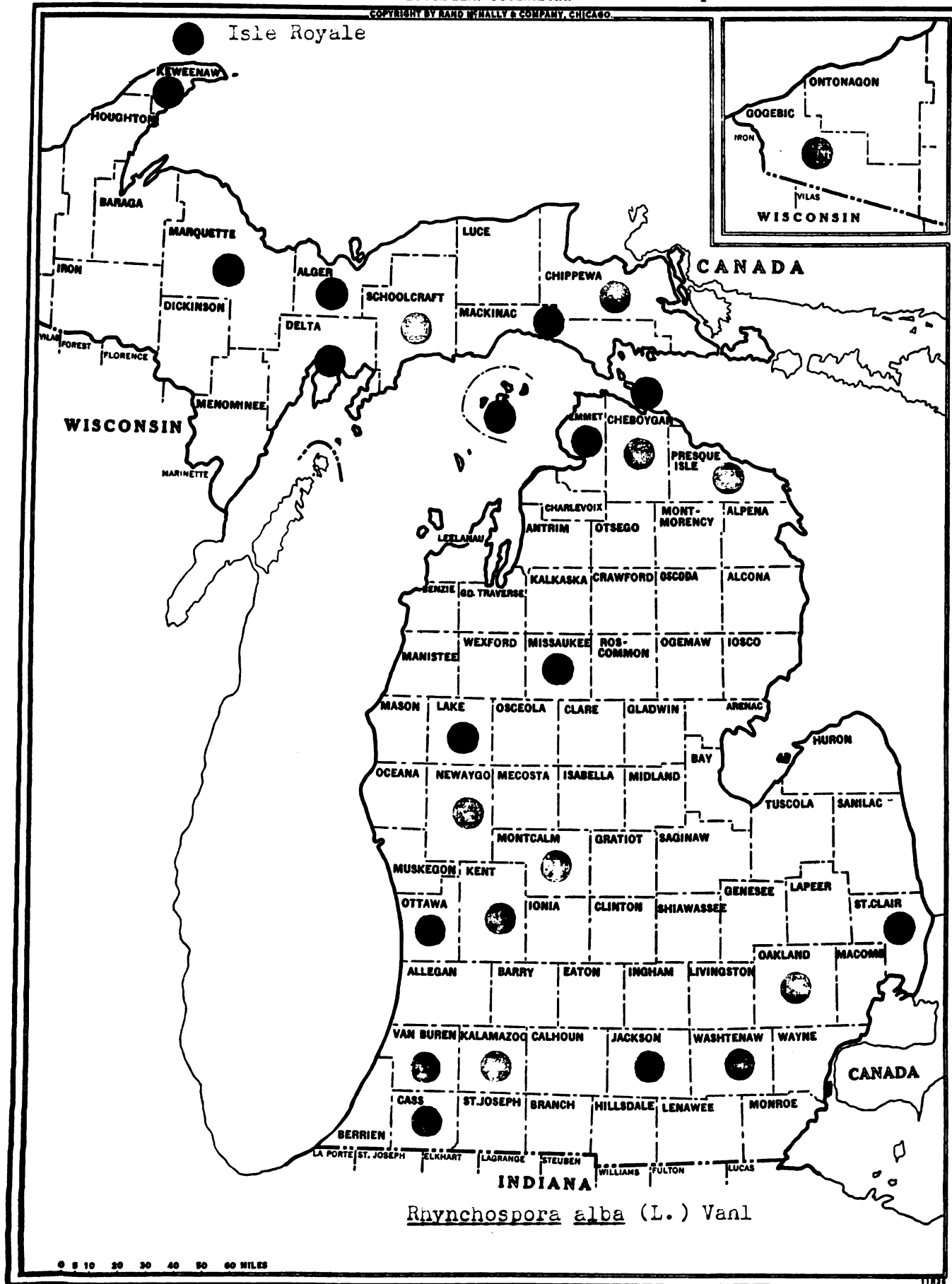
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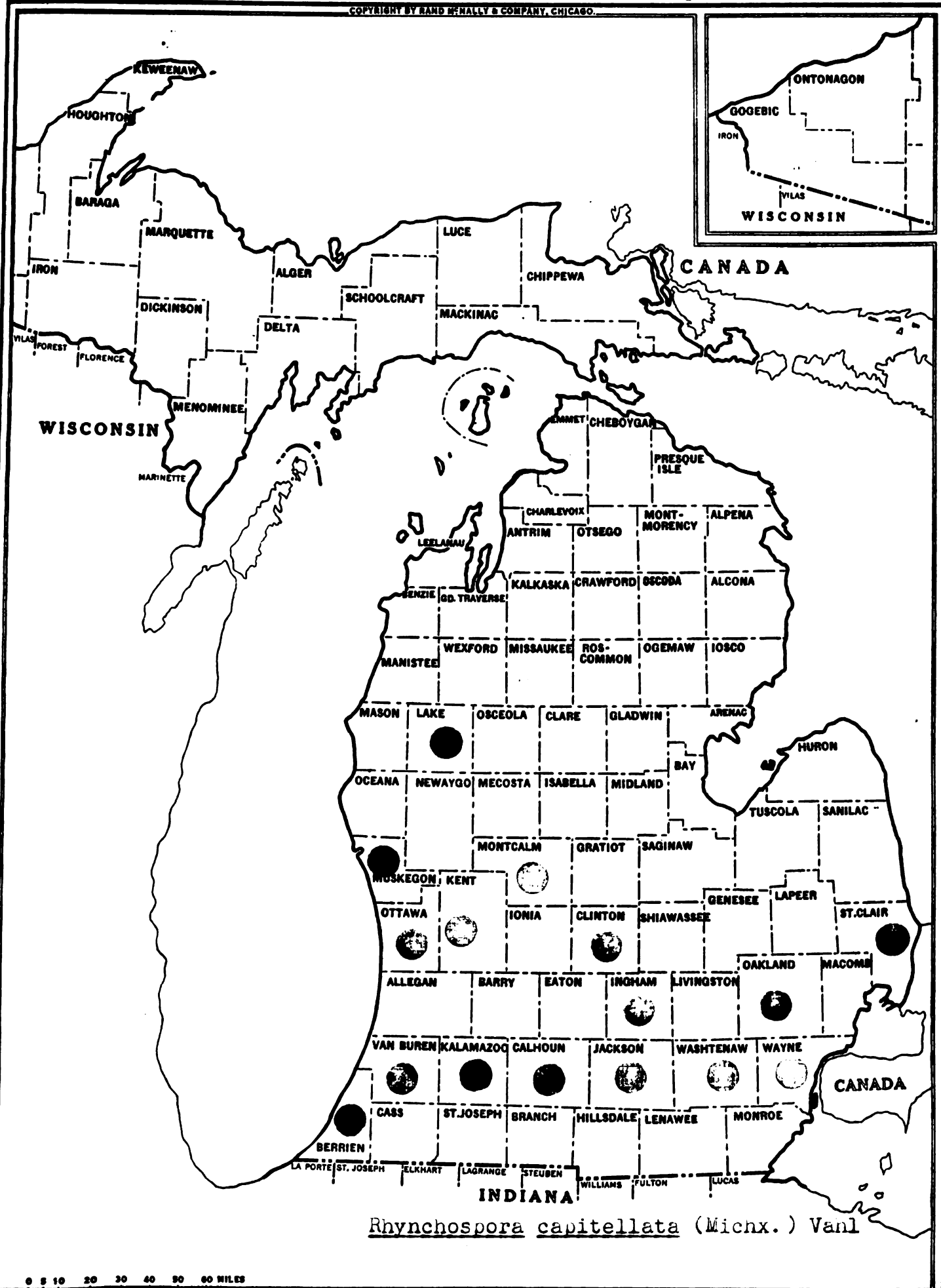
Rhynchospora macrostachya Torr.

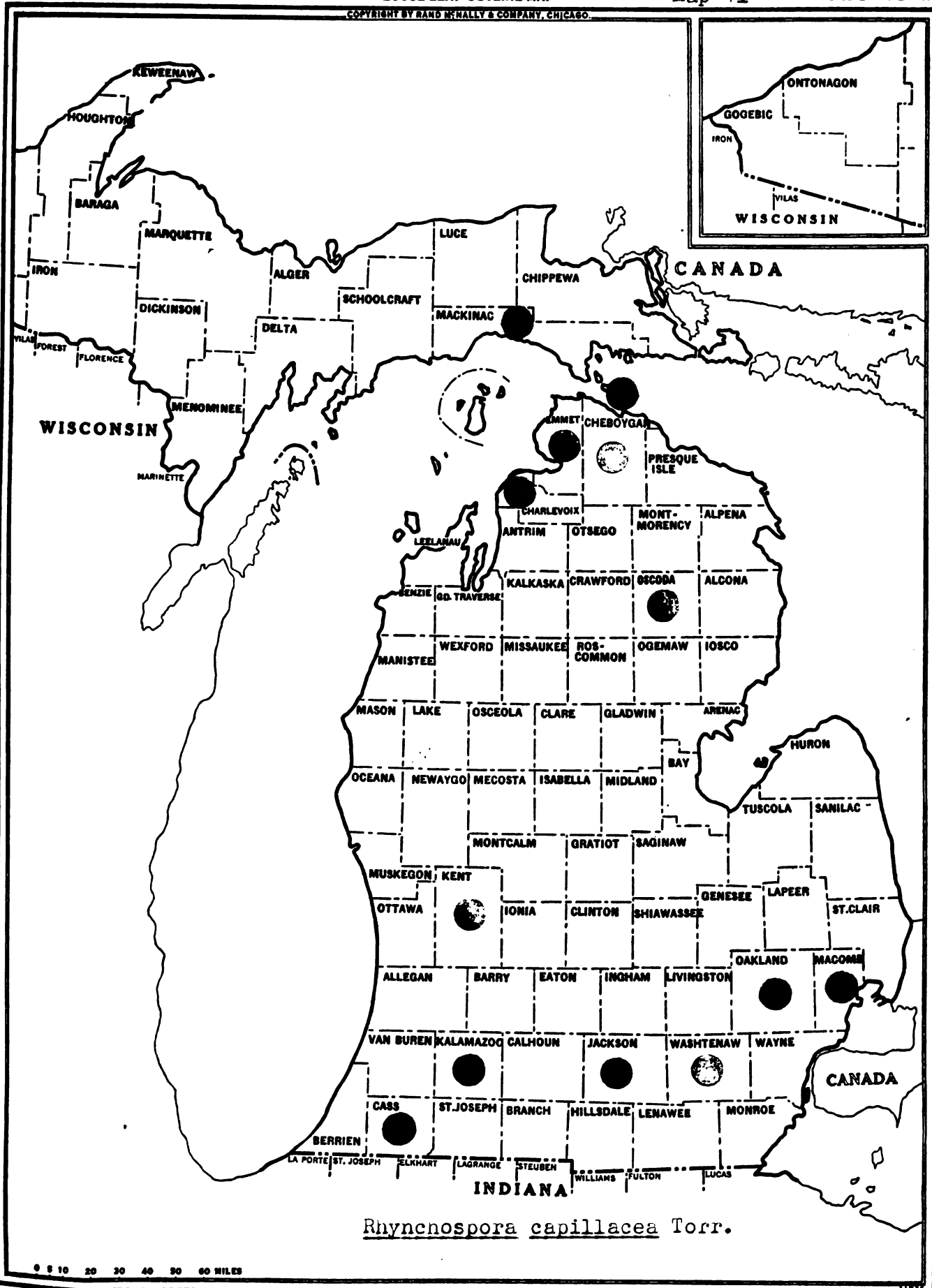
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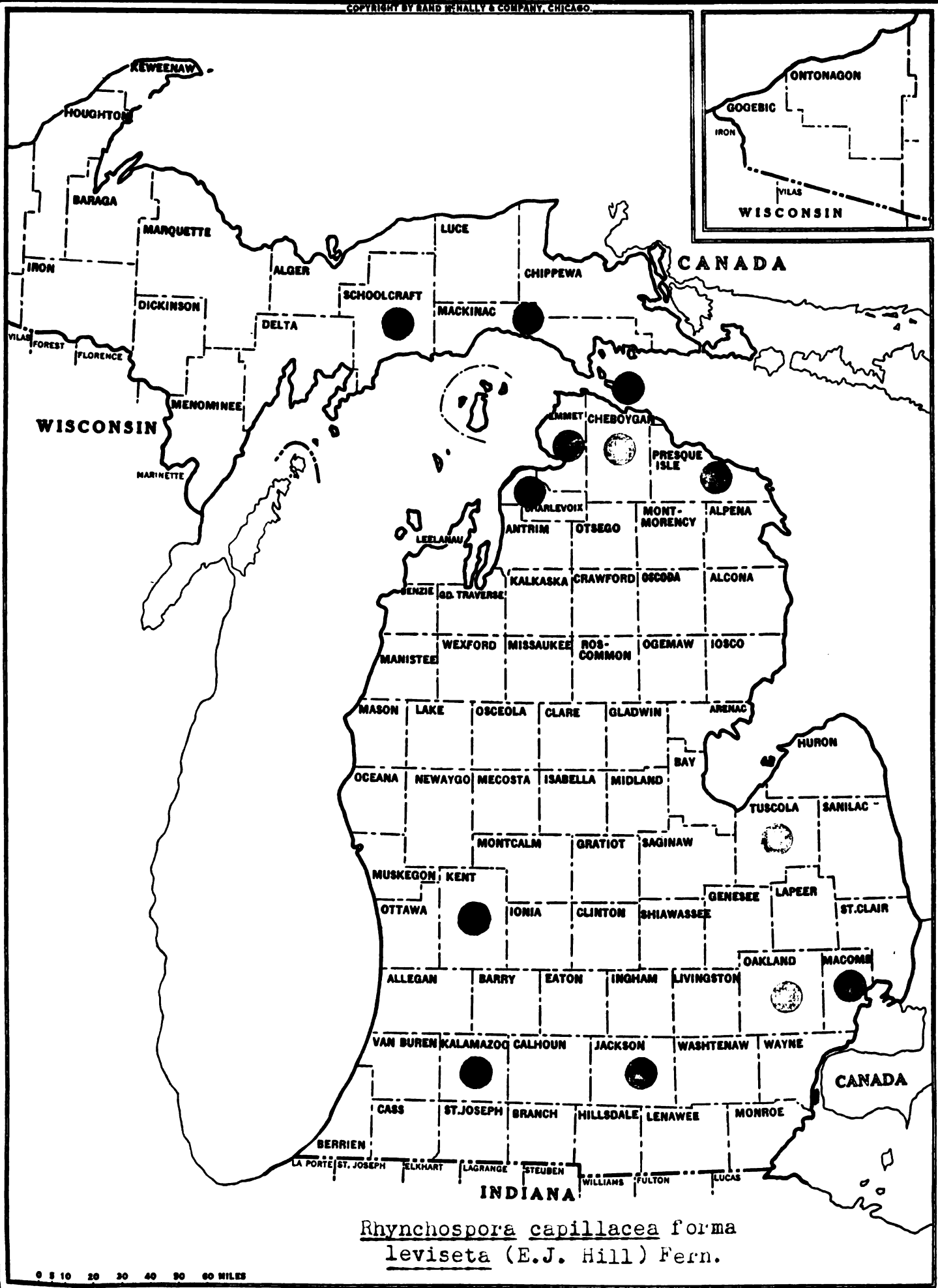


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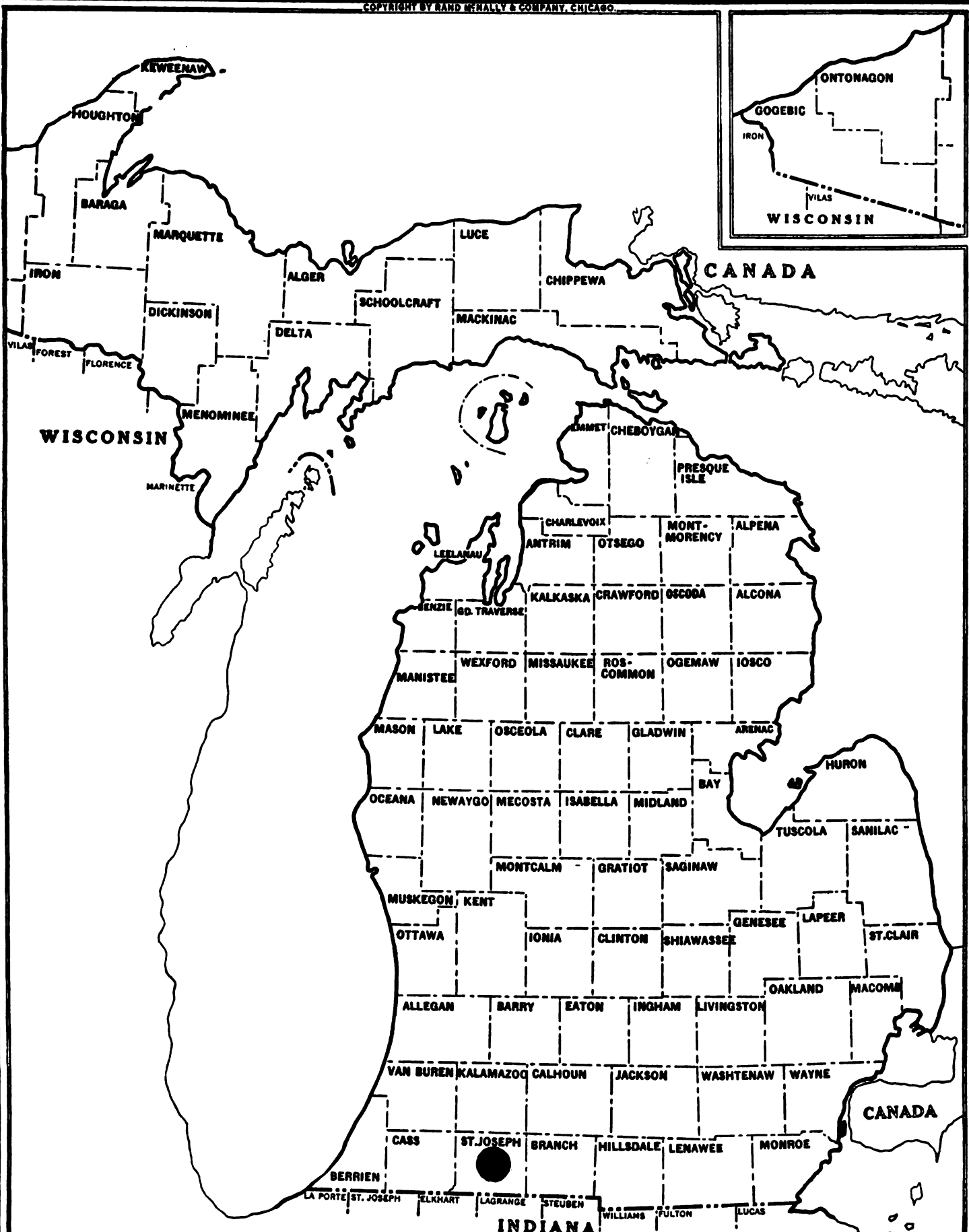


Rhynchospora capillacea Torr.



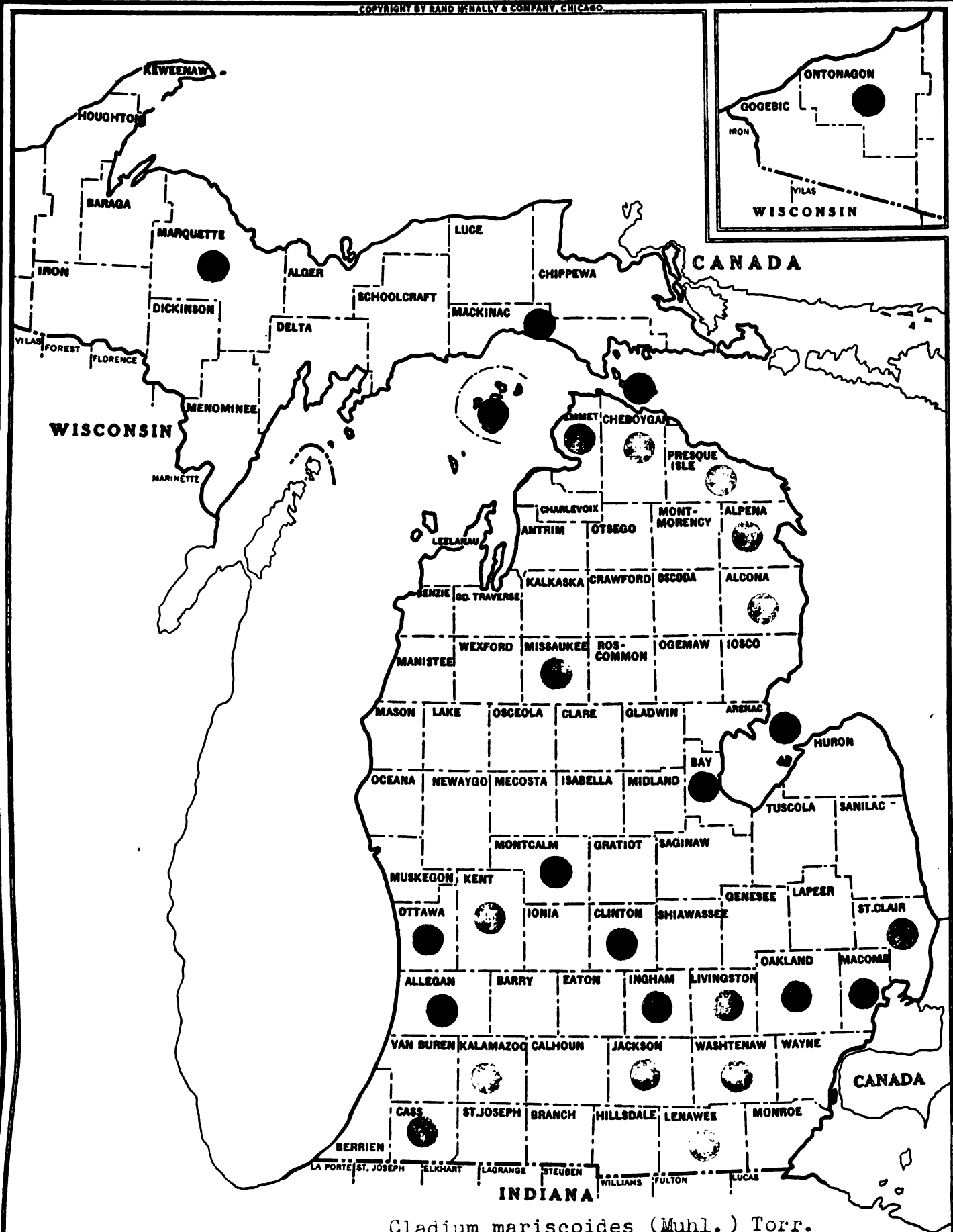
Rhynchospora capillacea forma
leviseta (E.J. Hill) Fern.

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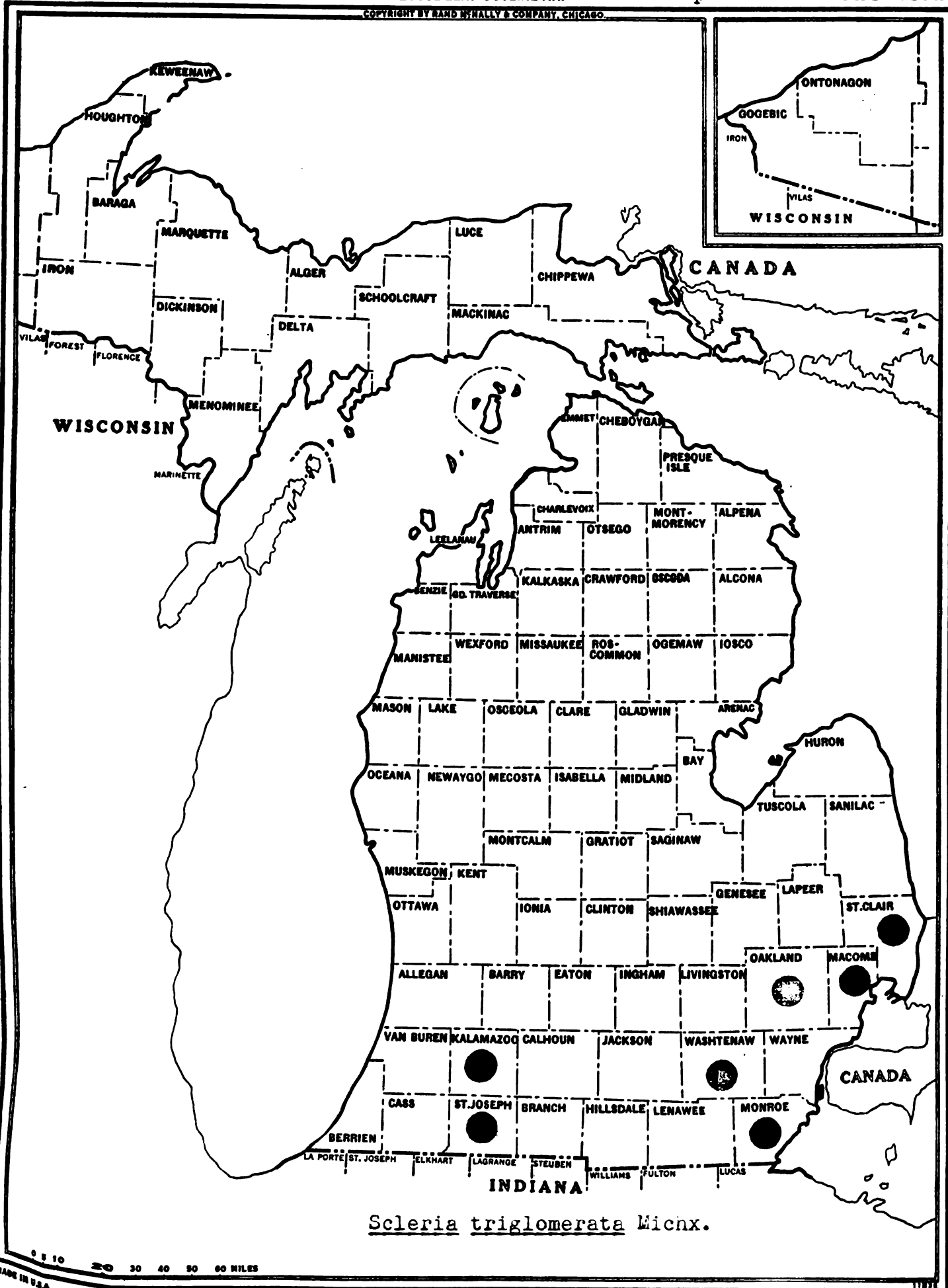
Rhynchospora globularis (Cnapp.) Small,
var. *recognita* Gale

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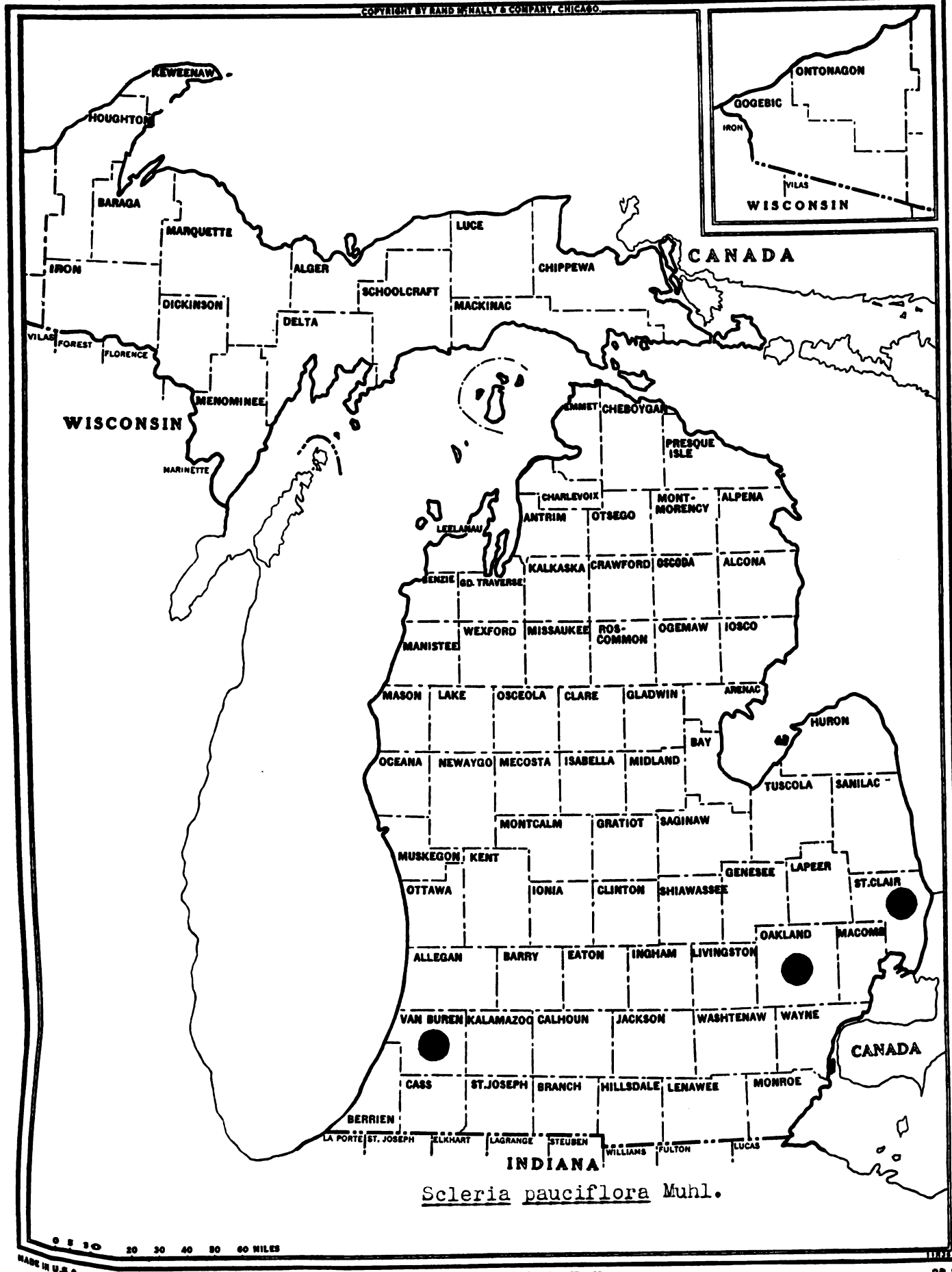
Cladium mariscoides (Muhl.) Torr.

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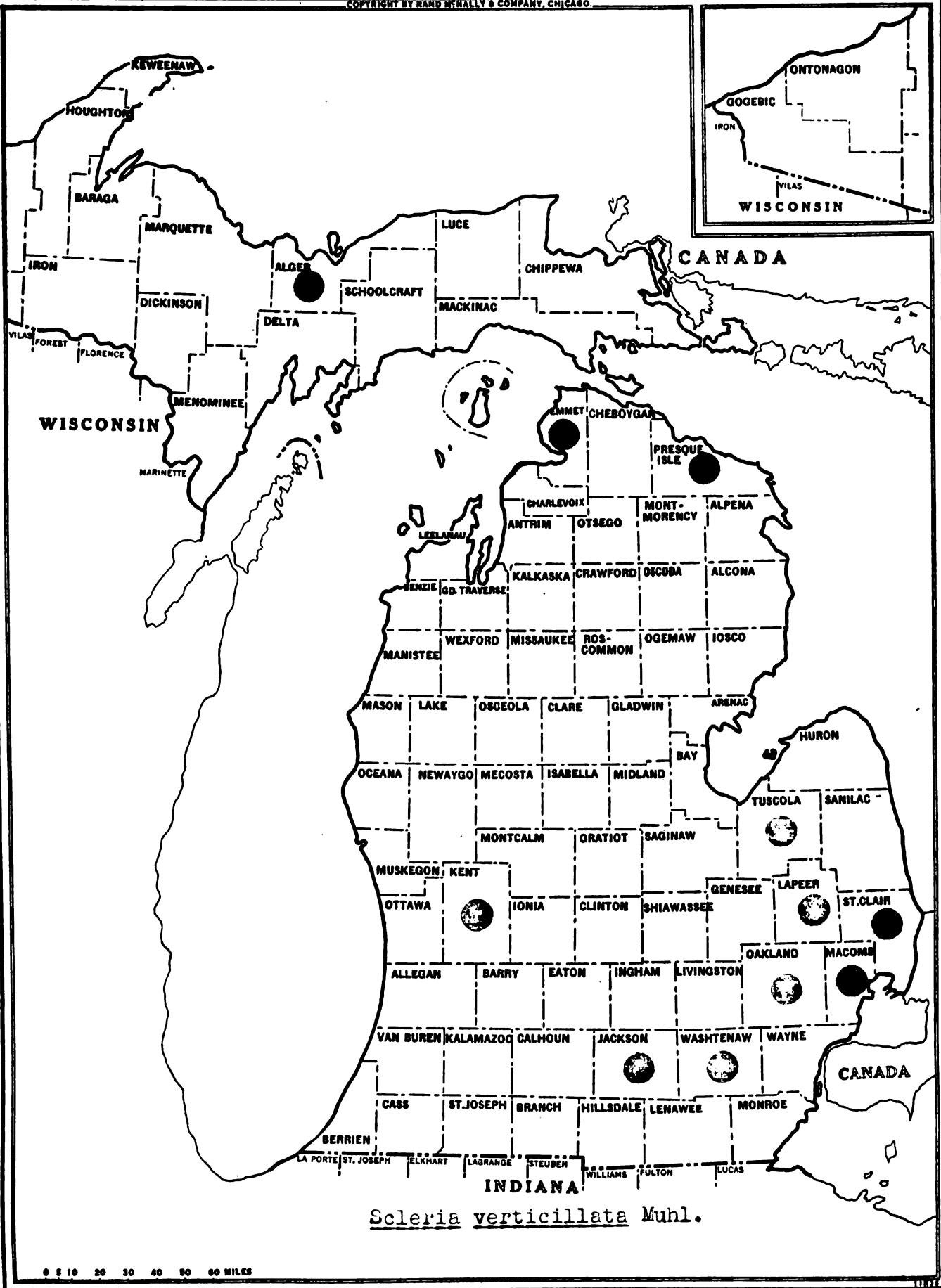


Scleria triglomerata Michx.

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Scleria pauciflora Muhl.



Scleria verticillata Muhl.

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