

## Lichens Known from Indiana

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The study of Indiana lichens has been sadly neglected, if one may judge by the published records. Only four short papers specifically mentioning Indiana lichens are known to me. Apparently, Dr. L. M. Underwood was the first to publish anything on Indiana lichens, giving thirty species in his "List of Cryptogams at Present Known to Inhabit the State of Indiana." This was published in the Proceedings of the Indiana Academy of Science for 1893. W. W. Calkins included a part of Lake County, Indiana, in his "Lichen Flora of Chicago and Vicinity," but failed to indicate the species occurring in Lake County. Bruce Fink and Sylvia Fuson listed 57 species of lichens in their paper "Ascomycetes New to the Flora of Indiana," published in the Indiana Academy of Science Proceedings for 1918. Fink lists a paper entitled "Lichens of Indiana," by W. H. Evans, read before the Indiana Academy of Sciences in 1887. It was said to have been published, but Fink was unable to locate any such publication. In *The American Midland Naturalist*, January, 1943, I reported upon a few lichens from the DePauw University Herbarium, mostly collected by Dr. Winona H. Welch.

It is self-evident that the lichens here given are but a small part of the total lichen flora of Indiana, but the list is presented in the hope that the botanists of the State will be stirred to some interest in these strange and sadly neglected plants. I have failed to locate any collections of Indiana lichens other than the one at DePauw University.

This apathy is unjustifiable, for no group of plants will better repay study, and certainly the puzzles presented by lichens are not exceeded by those found in any other group. The *Cladonias* are perhaps the most striking example of evolution here and now known to naturalists. For over fifty years they have been cited as the classic example of evolution going on before our eyes. In the opinion of some botanists lichens present to the student of heredity the most arrant contradictions and some of the greatest puzzles of the plant world. Their life contraverts much that is written on genetics, but as yet no geneticist has taken up seriously the study of heredity and variation in lichens.

A lichen is a physiological species, and not a species in the sense that cabbages, coconuts, and corn flowers are. Without the controlling apparatus of most plants, heredity in lichens and their responses to environment are as real and perceptible as in any other organisms. No chromosomes control lichen heredity, for a lichen is a composite. In spite of that, a lichen is a definite entity whose characters are somehow transmitted. At the same time it is able to respond to environmental demands. Lichens are highly plastic organisms, within their limits, and are ideal for studying ecology. They are equally well adapted for the

study of many physiological problems, both in the field and in the laboratory.

The present paper is based upon the study of the lichen collection in the DePauw University Herbarium, with the exception of most of the Cladoniaceae, which had already been determined by Dr. A. W. Evans and R. H. Torrey. It is due to the active cooperation and energy of Dr. Welch that this contribution to a knowledge of Indiana lichens and their distribution has been made. Without her untiring zeal this paper would not have been possible. Dr. Charles C. Deam, dean of Indiana systematic botanists, made a small collection of lichens at the request of the late Dr. C. C. Plitt. Dr. Deam kindly gave me a list of the species determined by Dr. Plitt. A few unnamed specimens in the DePauw Herbarium were named by me, and some unnamed parmeliads were identified by Dr. E. C. Berry. Full use was made of the lists published by Dr. L. M. Underwood and Dr. Bruce Fink. Dr. Berry's monograph of the genus *Parmelia* in North America north of Mexico gave species and localities not otherwise known from Indiana, and Fink's Lichen Flora yielded additional records. It is hoped that no lichens published as occurring in Indiana have been omitted. Where no one is indicated as naming a species, it has been identified by me.

The present list includes 121 species and named varieties. Where forms of species have been identified, they are listed under the species or variety to which they belong but are not given separate numbers. Specimens of all the lichens here named are in the DePauw University Herbarium, except specimens named by Dr. Bruce Fink, Dr. C. C. Plitt, and Dr. E. C. Berry. I have examined all the lichens in the DePauw University Herbarium except those named by Dr. Evans and Dr. Torrey, and am responsible for the list as it appears here. (DP.) indicates specimens now in the DePauw University Herbarium.

#### Verrucariaceae

*Verrucaria nigrescens* Persoon—On limestone boulders, Montgomery, Putnam, and Tippecanoe Counties. Fink.

*Verrucaria rupestris* Schrader—On exposed sandstone, limestone, and bricks, in Franklin, Monroe, Montgomery, and Putnam Counties. Fink.

*Verrucaria sordida* Fink—On limestone boulders, Montgomery County. Fink.

*Verrucaria viridula* Acharius—On rock, Montgomery County. Fink.

*Thelidium microbolum* (Tuck.) Hasse—Collected at the first bend in road 37, north of Bloomington, Monroe County. Spores colorless, bilocular to quadrilocular, 8-11 by 21-31  $\mu$ . Det. Herre.

*Thrombium epigaeum* (Pers.) Wallroth—On soil in Sayre's Wood, Union County. Fink.

## Pyrenulaceae

*Microthelia micula* Koerber—On cultivated cherry bark, Sayre's Wood, Union County. Fink.

*Pyrenula farrea* (Ach.) Br. & Rostr.—On beech bark, woods at Turkey Run, Parke County. Fink.

*Pyrenula nitida* (Weig.) Ach.—On trees, Turkey Run, Parke County. Fink.

## Dermatocarpaceae

*Dermatocarpon miniatum* (L.) Mann—a.—On limestone, fork of Clear Creek, near Harrodsburg, Monroe County. Welch Coll., No. 1920. Det. Herre. (DP.) b.—Bean Blossom Woods, northwest of Bloomington, near Griffy Creek Bridge, Monroe County. Welch Coll., No. 1925. Det. Welch; Herre. (DP.) c.—Eel River Falls, Owen County, October, 1893; Coll. and det. L. M. Underwood. (DP.) d.—On rock, 8 miles north of Bedford, Lawrence County. Coll. Nattkemper, May 12, 1935. Det. Herre. (DP.) e.—On limestone, one-half mile north of Vernon, along North Fork of Muscatatuck River, Jennings County. Coll. Welch, Nos. 7441 and 7448. Det. Herre. (DP.) f.—Limestone ledge, east of Amsterdam, Harrison County. Coll. Welch, No. 5239. Det. Torrey. Checked, Herre. (DP.) g.—On bare, hard, open portion of chicken lot, 3 miles northeast of Goodland, Jasper County. Coll. Welch, No. 2255. Det. Evans. (DP.) h.—Jones' Falls, 5 miles northwest of Greencastle, Putnam County, May 22, 1897. Det. checked by Herre. (DP.)

*Endocarpon pusillum* Hedwig—On bounders, Franklin, Montgomery, and Union Counties. Fink.

## Trypetheliaceae

*Trypethelium virens* Tuck.—On beech bark, Tippecanoe County. Fink.

## Arthoniaceae

*Arthonia dispersa* (Schrader) Nylander—On maple bark, Montgomery and Union Counties. Fink.

*Arthonia lecideella* Nyl.—On trees, Hendricks, Montgomery, Parke, Tippecanoe, and Union Counties. Fink.

*Arthonia radiata* (Pers.) Ach.—On basswood trees, Tippecanoe County. Fink.

*Allerthonia lapidicola* (Taylor) A. Zahlbr.—On sandstone, "Indiana," in Fink's Lichen Flora.

*Arthothelium spectabile* Mass.—Common, on beech trees, near Fern, Putnam County. Coll. Ralph C. Norton, April 19, 1894. Det. Herre. (DP.) Thallus brownish, off color, asci mostly sterile, spores finally muriform, 10-13 by 22.5-30  $\mu$ .

## Graphidiaceae

*Opegrapha varia* Pers.—On trees, Parke and Tippecanoe Counties. Fink.

*Graphis scripta* (L.) Ach.—Fern, Putnam County. Coll. and det. Underwood, October, 1891. Checked, Herre. (DP.)

## Pyrenopsidaceae

*Pyrenopsis fuscoatra* Fink—On limestone, Montgomery County. Fink.

## Collemaceae

*Collema nigrescens* (Hudson) DC. a.—Specimens sterile; on trees in Salt Creek Swamp, 12 miles southeast of Bloomington, Monroe County, Welch, No. 1924, and east of Vernon, Jennings County, Welch, No. 7460. Det. Herre. (DP.) b.—On white walnut, 5 miles north of Bedford, on state road 37, Lawrence County. Coll. Earl L. Harger, Jr., May 12, 1935. Det. Herre. (DP.)

*Collema pycnocarpum* Nyl.—On a tree trunk, Cedar Cliff, near Harrodsburg, Monroe County. Spores 3-4.7 by 10-12.5  $\mu$ . Coll. Welch, No. 1915. Det. Herre. (DP.)

*Collema ryssoleum* Tuck.—Spores quadrilocular. On rock, 7 miles north of Bedford, Lawrence County. Coll. Nattkemper, May 12, 1935. Det. Herre. (DP.)

*Leptogium chloromelum* (Swartz) Nyl.—a.—On oak trunk in woods one-half mile north of Vernon, Jennings County, along Muscatatuck River, North Fork. Coll. Welch, No. 7444. Det. Herre. (DP.) b.—A juvenile *Leptogium*, probably *L. chloromelum*. On limestone under ledge near Cataract Falls, Owen Park, Owen County. Coll. Welch, No. 6262. Det. Herre. (DP.)

*Leptogium dactylinum* Tuck.—Sandstone ledge, Fern, Putnam County, 7 miles west of Greencastle. Coll. Welch, No. 5493. Det. Herre. (DP.)

*Leptogium juniperinum* Tuck.—Spores 7-9 by 15.5-24  $\mu$ . On cedar bark, Schooner's Point, Crawford County. Coll. Welch, No. 7450. Det. Herre. (DP.)

*Leptogium lichenoides* (L.) A. Zahlbr.—Sterile. On dry exposed limestone, Geode Gorge, 6 miles east of Greencastle, Putnam County. Welch Coll., No. 7838. Det. Herre. (DP.)

*Leptogium lichenoides* (L.) A. Zahlbr. vr. *pulvinatum* (Hoffm.) A. Zahlbr.—On limestone, Cataract Falls, Owen County. Welch Coll., No. 5252. Det. R. H. Torrey. (DP.)

*Leptogium pulchellum* (Ach.) Nyl.—a.—On a fallen tree, east of Vernon, Jennings County, along the Muscatatuck River. Welch Coll., No. 7449. Det. Herre. (DP.)

*Leptogium tremelloides* (L.) S. F. Gray—On mossy rocks, Montgomery County. Fink.

### Stictaceae

*Lobaria pulmonaria* (L.) Hoffm.—a.—Eel River Falls, Owen County. Coll. and det. Underwood, October, 1893. Checked, Herre. (DP.) b.—Fern, Putnam County. Coll. L. M. Underwood, April, 1893. Det. Herre. (DP.)

*Sticta weigeli* (Ach.) Wainio—Perry County. Coll. C. C. Deam, No. 51508. Det. Plitt.

### Peltigeraceae

*Peltigera canina* (L.) Willd.—a.—On earth, on an oak slope along a creek in Sec. 26, about 2 and ½ miles southeast of Peppertown, Franklin County. Coll. C. C. Deam, No. 58029. Det. Herre. (DP.) b.—On soil at Cedar Cliff, near Harrodsburg, Monroe County. Welch Coll., No. 1916. Det. Herre. (DP.) c.—On sandstone, Sword Moss Gorge, near Fallen Rock, 14 miles west of Greencastle, Parke County. Welch Coll., No. 7458. Det. Herre. (DP.) d.—On moss and soil, DePauw University Arboretum, near Greencastle, Putnam County. Coll. Nattkemper, May 22, 1936. (DP.)

*Peltigera horizontalis* (Huds.) Baumg.—a.—Near Bloomington, Monroe County. Coll. Welch, No. 7431. Det. Herre. (DP.) b.—On rocks at The Shades, Montgomery County. Fink.

*Peltigera malacea* (Ach.) Funck—On soil, near Bloomington, Monroe County. Coll. Welch, No. 7468. Det. Herre. (DP.)

*Peltigera polydactyla* (Neck.) Hoffm.—a.—On limestone, among mosses, and mixed with *Cladonia* and *Physcia*, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7436. Det. Herre. (D.P.) b.—On rocks, near north stile, DePauw University Arboretum, Putnam County, mixed with *P. canina*. Coll. Welch, No. 5573. Det. Herre. (DP.)

*Peltigera praetextata* (Sommerf.) Wainio—a.—On limestone, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7438. Det. Herre. (DP.) b.—On tree roots, same locality as "a." Welch Coll., No. 7439. Det. Herre. (DP.) c.—Base of tree trunk, bank of stream, Fern, Putnam County, 7 miles west of Greencastle. Coll. Welch, No. 5494. Det. Herre. (DP.) d.—On limestone, in woods, Hoosier Highlands, Putnam County. Coll. Welch, No. 2251. Det. Herre. (DP.) e.—On limestone in woods, Tippecanoe County. Fink.

*Peltigera praetextata* (Sommerf.) Wainio var. *isidiata* (Timko) Gyelnik—On sandstone, Fern, Putnam County, 7 miles west of Greencastle. Coll. Welch, No. 7837. Det. Herre. (DP.)

*Peltigera rufescens* (Weiss) Humboldt.—a.—Perry County. Deam Coll., No. 46747. Det. Plitt. b.—On a rotten log, low rich woods, 2 miles north and 2 and ½ miles east of Kingsland, Wells County. Coll. C. C. Deam, No. 14481A. Det. Welch; Herre. (DP.) c.—On sandstone ledge, on west side of White River, one-half mile above Shoals, Martin County. Coll. Deam, No. 11421A. Det. Herre. (DP.) d.—On the ground under a pin oak, in woods about 2 miles north of Livonia, Washington County. Coll. C. C. Deam, No. 56329. Det. Herre. (DP.) This same number has been determined as *Peltigera spuria* by Dr. C. C. Plitt. The collection must have been of mixed material, a circumstance often occurring in collecting lichens.

*Peltigera spuria* (Ach.) DC.—a.—Crawford County. Coll. C. C. Deam, No. 52619. b.—Washington County. Coll. Deam, No. 56329. Both determined by Dr. C. C. Plitt.

#### Lecidaceae

*Lecidea coarctata* (J. E. Smith) Nyl.—On bricks and moist rocks, Crawford's Wood, Montgomery County. Fink.

*Lecidea vulgata* A. Zahlbr.—On rocks, Union County. Fink, as *Lecidea enteroleuca* Ach.

*Lecidea myriocarpoides* Nyl.—On a rotten stump, Indiana University Campus Wood. Fink.

*Lecidea uliginosa* (Schrad.) Ach.—On rotten stumps, in Hendricks, Montgomery, and Union Counties. Fink.

*Lecidea Russellii* Tuck.—Specimens sterile and scanty. On limestone, Cedar Cliff, near Harrodsburg, Monroe County. Coll. Welch, No. 1917. Det. Herre. (DP.)

*Bacidia inundata* (E. Fr.) Koerber—On moist bricks and rocks, Monroe, Montgomery, Putnam, Tippecanoe, and Union Counties. Fink.

*Bacidia luteola* (Schrad.) Mudd—On willows, Tippecanoe County. Fink, as *Bacidia rubella*.

*Bacidia Schweinitzi* (Tuck.) Schneider—On beech trees, Sayre's Woods, Union County. Fink.

*Rhizocarpon albineum* (Tuck.)—"Indiana," in Fink's Lichen Flora.

#### Cladoniaceae

*Cladonia bacillaris* (Del.) Nyl.—a.—On stumps in open pasture, Hendricks County. Fink. b.—On rotten stump, Highway 37, 7 miles north of Bedford, Lawrence County. Coll. Nattkemper, May 12, 1935. Det. Dr. A. W. Evans. (DP.)

*Cladonia bacillaris* f. *abbreviata* (Wainio.) Harm.—Log along ravine, one-half mile south of Freedom, Owen County. Coll. Welch, No. 2209. Det. Evans. (DP.)

*Cladonia barbonica* (Del.) Nyl. f. *cylindrica* Evans—a.—On rotten stump, Highway 37, 7 miles north of Bedford, Lawrence County. Coll. Clark Nattkemper, May 12, 1935. Det. A. W. Evans. (DP.) b.—On base of a live tamarack tree in large bog about 2 miles north of Pinhook, about 6 miles west of Laporte, Laporte County. Coll. Chas. C. Deam, No. 56050. Det. Evans. (DP.) c.—On dry, shaded log, McCormick's Creek State Park, river road, Owen County. Coll. Welch, No. 5242. Det. Torrey. (DP.)

*Cladonia caespiticia* (Persoon) Floerke—a.—Crawford County. Coll. Deam, No. 52621. Det. Plitt. b.—Woods, on elm trunk, Dubois County. Coll. Welch, No. 5240. Det. R. H. Torrey. (DP.)

*Cladonia cariosa* (Ach.) Sprengel—a.—On soil, in Crawford's Woods, Montgomery County. Det. Fink. b.—On soil, near Martinsville, Morgan County. Coll. Welch, No. 7454. Det. Herre. (DP.)

*Cladonia chlorophaea* (Floerke) Spreng.—a.—Wooded bank along Cedar Creek, about 2 miles north of Cedarville, Allen County. Coll. Deam, No. 14286. Det. Evans. (DP.) b.—On base of a live tamarack tree in large bog about 2 miles north of Pinhook, about 6 miles west of Laporte, Laporte County. Coll. Chas. C. Deam, No. 56050 and 56049. Det. Evans. (DP.) c.—About old tamarack stump in clearing west side of Wolf Lake, Noble County. Coll. Chas. C. Deam, No. 14730A. Det. Evans. (DP.) d.—Soil, head of Bloomington Water Works Lake, Monroe County. Coll. Welch, No. 2208. Det. Evans. (DP.) e.—Pine Hills, Montgomery County. Coll. Welch, No. 7839. Det. Herre. (DP.)

*Cladonia chlorophaea* f. *simplex* (Hoffm.) Arnold—a.—Sandstone soil, Scout Camp, Portland Arch, Fountain County. Coll. Welch, No. 5243. Det. R. H. Torrey. (DP.) b.—Soil, wooded bank of Big Creek, about 14 miles northwest of Hanover, Jefferson County. Coll. Welch, No. 5247. Det. Torrey. (DP.) c.—Edge of rim of quarry, on limestone, McCormick's Creek State Park, Owen County. Coll. Welch, No. 5249. Det. Torrey. (DP.) d.—On soil, wooded ridge, along Eel River, Owen Park, Owen County. Coll. Welch, No. 5254. Det. Torrey. (DP.) e.—Sandstone, De Weir Woods, Perry County, near Cannelton. Coll. Welch, No. 5245. Det. Torrey. (DP.) f.—Soil, wooded slope, oak-hickory woods, 10 miles east of Salem, Washington County. Coll. Welch, No. 5235. Det. Torrey. (DP.) g.—Soil, 10 miles east of Salem, Washington County. Coll. Welch, No. 5250. Det. Torrey. (DP.)

*Cladonia coniocraea* (Floerke) Sandstede—a.—On rail fences and old logs, Hendricks, Montgomery, Tippecanoe, and Union Counties. Fink. b.—Beanblossom Woods, northwest of Griffy Creek Bridge, 6 miles north of Bloomington, Monroe County. Coll. Flora Anderson, December 15, 1929. Det. Anderson; Herre. (DP.) c.—On soil, The Shades, Montgomery County. Coll. Welch, No. 7456. Det. Herre. (DP.) d.—On

decaying log, on wooded slope, Fern, 7 miles west of Greencastle, Putnam County. Coll. Welch, No. 5497. Det. Herre. (DP.) e.—Near Fern, Putnam County. Coll. Ralph C. Norton, May 10, 1894. Det. Herre. (DP.) f.—Base of white oak tree, Eel River bank, Owen Park, Owen County. Coll. Welch, No. 5251. Det. Torrey. (DP.)

*Cladonia coniocraea* (Floerke) Sandst. f. *ceratodes* Dalla T. & Sarnth. —a.—On sandstone soil, woods, Dubois County. Coll. Welch, No. 5234. Det. Torrey. (DP.) b.—On decaying log, in oak woods, 3 miles south of Hanover, Jefferson County. Coll. Welch, No. 5246. Det. Torrey. (DP.) c.—On decaying log, oak-hickory woods, 10 miles east of Salem, Washington County. Coll. Welch, No. 5248. Det. Torrey. (DP.)

—*Cladonia cristatella* Tuckerman—a.—On soil, near Bloomington, Monroe County. Coll. Welch, No. 7466. Det. Herre. (DP.) b.—On soil, Pine Hills, Montgomery County. Coll. Welch, No. 7842. Det. Herre. (DP.) c.—On soil near Martinsville, Morgan County. Coll. Welch, No. 7453. Det. Herre. (DP.) d.—On soil in oak-hickory woods, near Martinsville, Morgan County. Coll. Welch, No. 7452. Det. Herre. (DP.) e.—Sandy hill in woods, vicinity of Huckleberry, Steuben County. Coll. Chas. C. Deam, September 9, 1903. Det. Herre. (DP.) f.—Richmond, Wayne County. Coll. Mrs. Mary P. Haines. Det. Herre. (DP.)

*Cladonia cristatella* Tuck. f. *beauvoisi* (Delise) Wainio—a.—On soil, Bloomington Water Works Lake, Monroe County. Coll. Welch, No. 2210. Det. Evans. (DP.) b.—Top of bank at Hemlock Bluffs on Raccoon Creek, about 6 miles south of Spencer, Owen County. Coll. Chas. C. Deam, No. 10207. Det. Evans. (DP.) c.—Steuben County. Coll. Deam, No. 52454. Det. Plitt.

*Cladonia cristatella* Tuck. f. *ochrocarpia* Tuck.—On soil, near Martinsville, Morgan County. Coll. Welch, No. 7452. Det. Herre. (DP.)

*Cladonia cristatella* Tuck. f. *vestita* Tuck.—a.—Jefferson County. Coll. C. C. Deam, No. 53410C. Det. Plitt. b.—On soil, head of Bloomington Water Works Lake, Monroe County. Coll. Welch, No. 2205. Det. Evans. (DP.) c.—Ditto, No. 2210. Det. Evans. (DP.) d.—On soil, near Bloomington, Monroe County. Coll. Welch, No. 7467. Det. Welch; Herre. (DP.) e.—Steuben County. Deam Coll., September 9, 1903. Det. Evans. (DP.) f.—Switzerland County. Deam Coll., No. 58114B. Det. Torrey. (DP.) g.—On decayed wood, oak-hickory association, 10 miles east of Salem, Washington County. Coll. Welch, No. 5238. Det. Torrey. (DP.) h.—“Indiana.” Deam Coll., No. 56049. Det. Evans. (DP.)

*Cladonia fimbriata* (L.) E. Fr.—On decaying log, in woods one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7518. Det. Herre. (DP.)

*Cladonia fimbriata* f. *conista* Oliv. s.f. *simplex* A. Zahlbr.—On limestone, on south-facing slope of Cedar Cliff, near Harrodsburg, Monroe County. Coll. Welch, No. 1922. Det. Evans. (DP.)

*Cladonia fimbriata* var. *simplex* (Weiss) Flotow—a.—On decaying log, in woods one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7518. Det. Herre. (DP.) b.—Pigeon River, sand dune, Lagrange County. Coll. Welch, No. 7451. Det. Herre. (DP.) c.—On soil, The Shades, Montgomery County. Coll. Welch, No. 7456. Det. Herre. (DP.)

*Cladonia furcata* var. *corymbosa* (Ach.) Nyl.—Upland soil, in beech woods along Saluda Creek, a quarter mile south of Saluda School, Jefferson County. Coll. Welch, No. 5241. Det. by Torrey as *C. furcata* var. *racemosa* f. *corymbosa*. (DP.)

*Cladonia furcata* var. *pinnata* (Floerke) Wainio—Wooded bank along Cedar Creek, about 2 miles north of Cedarville, Allen County. Coll. Deam, No. 14286. Det. Evans. (DP.)

*Cladonia furcata* var. *pinnata* f. *foliosa* Del.—On rim of quarry, in shade, McCormick's Creek State Park, Owen County. Coll. Welch, No. 5236. Det. Torrey. (DP.)

*Cladonia furcata* var. *racemosa* (Hoffm.) Floerke—In open dry woods, State Reserve, Clark County. Coll. C. C. Deam, No. 5398. Det. Evans. (DP.)

*Cladonia furcata* (Huds.) Schrad. var. *racemosa* (Hoffm.) Floerke f. *squamulifera* Sandst.—a.—On limestone, on south-facing slope, Cedar Cliff, near Harrodsburg, Monroe County. Coll. Welch, No. 1921. Det. Evans. (DP.) b.—On dry wooded slope, Pine Hills, Montgomery County. Coll. Welch, No. 2197. Det. Evans. (DP.) c.—Hoosier Highlands, Putnam County. Coll. Welch, No. 2207. Det. Evans. (DP.) d.—On soil, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 11, 1935. Det. Evans. (DP.)

*Cladonia grayi* Merrill—a.—On soil, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 11, 1935. Det. Evans. (DP.) b.—Pastured waste land, shade of huckleberries or in open. White County. Coll. Welch, No. 2199. Det. Evans. (DP.)

*Cladonia grayi* pp. f. *squamulosa* Sandst.—On ground in sandy woods near Huckleberry, Steuben County. Coll. C. C. Deam, September 9, 1903. Det. Evans. (DP.)

*Cladonia macilenta* Hoffm.—a.—On decaying log, in woods one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7517. Det. Herre. (DP.) b.—On rail fences and old logs, Montgomery, Tippecanoe, and Union Counties. Fink.

*Cladonia mitrula* Tuckerman—a.—In woods one-half mile south of Lake Cicott, Cass County. Coll. Welch, No. 5576. Det. Herre. (DP.) b.—On log in woods, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7434. Det. Herre. (DP.) c.—On limestone, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7436. Det. Herre. (DP.) d.—On decaying log, in woods, one-half mile north

of Vernon, Jennings County along North Fork of Muscatatuck River. Coll. Welch, No. 7440. Det. Herre. (DP.) e.—On tree trunk, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7443. Det. Herre. (DP.) f.—On soil, in woods, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7445. Det. Herre. (DP.) g.—On rotten wood, tree trunk, one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7516. Det. Herre. (DP.) h.—On soil, The Shades, Montgomery County. Coll. Welch, No. 7455. Det. Herre. (DP.)

*Cladonia mitrula* Tuck. f. *imbricatula* (Nyl.) Wainio—a.—On a tree, west of Alpine, Fayette County. Coll. Floyd Shuttleworth, March, 1932. Det. Evans. (DP.) b.—On limestone, McBride Bluffs, near Shoals, Martin County. Coll. Welch, No. 5237. Det. Torrey. (DP.) c.—On an old stump, on road between Ellettsville and Spencer, Owen County. Coll. Nattkemper, May 12, 1935. Det. Evans. (DP.) d.—On soil, wooded ridge, Eel River, Owen Park, Owen County. Coll. Welch, No. 5253. Det. Torrey. (DP.) e.—Roadside cut, woods, 4.7 miles northwest of Mt. Vernon, Posey County. Coll. Deam, No. 22870. Det. Evans. (DP.) f.—On soil on slope in wooded pasture, 5 and ½ miles south of Greencastle, Putnam County. Coll. Welch, No. 5256. Det. Torrey. (DP.)

*Cladonia mitrula* f. *squamulosa* Merrill—On dead log along road to Hovey Lake, Mt. Vernon, Posey County. Coll. Clark Nattkemper, May 11, 1935. Det. Evans. (DP.)

*Cladonia piedmontensis* Merrill f. *obconica* Robbins—On soil, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 11, 1935. Det. Evans. (DP.)

*Cladonia pyxidata* (L.) Hoffm.—a.—On soil, The Shades, Montgomery County. Coll. Welch., No. 7456. Det. Herre. (DP.)

*Cladonia pyxidata* (L.) Hoffm. f. *simplex* (Ach.) Harm.—On soil on slope in wooded pasture, 5 and ½ miles south of Greencastle, Putnam County. Coll. Welch, No. 5255. Det. Torrey. (DP.)

*Cladonia rangiformis* Hoffmann—Near Greencastle, Putnam County. Det. Herre. (DP.)

*Cladonia subcariosa* (Nyl.) Wainio—a.—Davies County. Coll. C. C. Deam, No. 52713. Det. C. C. Plitt. b.—Jefferson County. Coll. C. C. Deam, No. 53410D. Det. C. C. Plitt. c.—On soil, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 11, 1935. Det. Evans. (DP.)

*Cladonia subcariosa* p. *max.* p.f. *evoluta* Wainio—Open, dry, grassy habitats, head of Bloomington Water Works Lake, Monroe County. Coll. Welch, No. 2211 and No. 2296. Det. Evans. (DP.)

*Cladonia symphyocarpa* (Ach.) E. Fr.—Fern, Putnam County, 7 miles west of Greencastle. Coll. and det. L. M. Underwood, April, 1893. Checked, Herre. (DP.)

*Cladonia tenuis* Harm.—a.—On soil, ridge, Scout Camp, Portland Arch, Fountain County. Coll. Welch, No. 5244. Det. Torrey. (DP.) b.—Franklin County. Coll. C. C. Deam, No. 47317. Det. Plitt. c.—On open dry ground, head of Bloomington Water Works Lake, Monroe County. Coll. Welch, No. 2202. Det. Evans. (DP.) d.—Hoosier Highlands, Putnam County. Coll. Welch, No. 6002. Det. Evans. (DP.) e.—On soil, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 11, 1935. Det. Evans. (DP.) f.—Pastured waste land, shade of *Quercus alba*, Princeton Township, White County. Coll. Welch, No. 2203. Det. Evans. (DP.)

*Cladonia uncialis* (L.) Weber f. *obusata* (Ach.) Wainio—Warren County. Coll. C. C. Deam, No. 50637. Det. C. C. Plitt.

*Cladonia verticillata* Hoffm. var. *evoluta* Th. Fr.—a.—On ground in woods 4 miles southeast of Corydon, Harrison County. Coll. C. C. Deam, No. 18695. Det. Evans. (DP.) b.—On soil, Bloomington Waterworks Lake, northeast of Bloomington, Monroe County. Coll. Welch, No. 1923. Det. Evans. (DP.) c.—Open grassy land, head of Bloomington Waterworks Lake, Monroe County. Coll. Welch, No. 2206. Det. Evans. (DP.) d.—Head of Waterworks Lake, Griffy Creek, northeast of Bloomington, Monroe County. Coll. Welch, Nos. 7429 and 7430. Det. Welch; Herre. (DP.) e.—In an old fallow field, 1 and ½ miles southeast of Fairview, Switzerland County. Coll. C. C. Deam, No. 58144. Det. Herre. (DP.)

*Cladonia verticillata* f. *phyllocephala* (Flotow) Wainio—Jefferson County. Coll. C. C. Deam, No. 53410A. Det. Plitt.

#### Acarosporaceae

*Thelocarpon prasinellum* Nyl.—On a board, Sayre's Woods, Union County. Fink.

*Acarospora cervina* (Ach.) Mass.—On granite boulders, Montgomery County. Fink.

#### Pertusariaceae

*Pertusaria pustulata* (Ach.) Duby—On apple trees, Sayre's Woods, Union County. Fink.

#### Lecanoraceae

*Lecanora dispersa* (Pers.) Röhling—On boulders, Franklin, Montgomery, and Union Counties. Fink.

*Lecanora hageni* Ach.—On fences, stumps, and limestone, Monroe, Montgomery, and Union Counties. Fink.

*Lecanora subfusca* (L.) Ach.—On trunk of elm tree, 1012 South College Street, Greencastle, Putnam County. Welch. Coll., No. 7840. Not typical, like California or Austrian material, but agreeing with other specimens from the Midwest. Perhaps condition of plants due to effects of soft-coal or fuel-oil smoke. (DP.)

*Lecanora varia* (Hoffm.) Ach.—On trees, stumps, and fences, Hendricks, Montgomery, and Union Counties. Fink.

*Candelariella aurella* (Hoffm.) A. Zahlbr.—On rocks, Montgomery and Union Counties. Fink, listed as *Placodium aurellum*.

### Parmeliaceae

*Candelaria concolor* (Dickson) Arnold—On a tree, along Ohio River, 9 miles west of Mt. Vernon, Posey County. Coll. Clark Nattkemper, May 11, 1935. Det. Torrey. (DP.)

*Parmeliopsis diffusa* (Weber) Kiddle—On a fallen tree, by Walnut Creek, 5 miles west of Greencastle, Putnam County. Coll. Clark Nattkemper, No. 13, March 19, 1936. Det. Herre. (DP.)

*Parmelia borrieri* Turner—a.—At base of honey locust tree, Cedar Cliff, near Harrodsburg, Monroe County. Coll. Welch, No. 1918. Det. Herre. (DP.) b.—On bark of sugar maple, Greencastle, Putnam County. Coll. Desiah Hamilton, March 25, 1908. Det. Herre. (DP.) c.—Union County. Collected by Fink and Fuson. Determined by E. C. Berry.

*Parmelia caperata* (L.) Ach.—a.—Brown County. Coll. C. C. Deam, No. 58361. Det. Torrey. (DP.) b.—On sandstone in Bear Creek Canyon, south of Fountain, Fountain County. Coll. C. C. Deam, No. 22252. Det. E. C. Berry. c.—Fountain County. Coll. C. C. Deam, No. 22542. Det. C. C. Plitt. d.—On tree trunk, in woods one-half mile north of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7447. Det. Herre. (DP.) e.—On fallen tree, east of Vernon, Jennings County, along North Fork of Muscatatuck River. Coll. Welch, No. 7459. Det. Herre. (DP.) f.—In Beanblossom Woods, near Bloomington, Monroe County. Coll. Welch, No. 1926. Det. Welch. Checked, Herre. (DP.) g.—On honey locust, Cedar Cliff, near Harrodsburg, Monroe County. Coll. Welch, No. 1919. Det. Herre. (DP.) h.—Fern, Putnam County. Coll. and det. L. M. Underwood, April 1893. Checked, Herre. (DP.) i.—On rail fence, Greencastle, Putnam County. Coll. Desiah Hamilton. Det. Herre. (DP.)

*Parmelia centrifuga* (L.) Ach.—In woods, 6 miles north of Bloomington, on Bean Blossom Creek, northwest of Griffy Creek bridge, Monroe County. Coll. Welch, No. 1927. Det. Herre. (DP.)

*Parmelia cetrata* Ach.—On cork elm, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 12, 1935. Det. Herre. (DP.)

*Parmelia conspersa* (Ehrh.) Ach.—a.—On sandstone along Little Blue River, near old Canes Mill, about 2 miles south of Grantsburg, Crawford County. Coll. C. C. Deam, No. 46740. Det. E. C. Berry. b.—On granite boulders, in Crawford's Woods, Montgomery County. Fink.

*Parmelia conspersa* f. *imbricata* Mass.—Crawford County. Coll. Deam, No. 51607, pro parte. Det. Plitt.

*Parmelia perforata* (Wulf.) Ach.—On cork elm, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 12, 1935. Det. Herre. (DP.)

*Parmelia perlata* (L.) Ach.—On a tree, 13 miles east of Boonville, Warrick County. Coll. Clark Nattkemper, May 12, 1935. Det. Torrey. (DP.)

*Parmelia physodes* (L.) Ach.—“Indiana.” Engelmann Coll., 1827; specimen in Missouri Botanical Garden. Det. E. C. Berry.

*Parmelia quercina* (Willd.) Wainio—a.—On dead tree branch, east of Vernon, Jennings County, along Muscatatuck River. Coll. Welch, No. 7462. Det. Herre. (DP.) b.—On fallen tree, by Walnut Creek, 5 miles west of Greencastle, Putnam County. Coll. Clark Nattkemper, March 19, 1936. Det. Torrey. (DP.)

*Parmelia rudecta* Ach.—a.—On trees, in Franklin, Hendricks, Montgomery, Parke, Tippecanoe, and Union Counties. Fink. b.—1.3 miles east of Frichton, Knox County. Coll. Hubricht, B161. Det. E. C. Berry. c.—On bark of tree, by Walnut Creek, 5 miles west of Greencastle, Putnam County. Coll. Clark Nattkemper, March 19, 1936. Det. Torrey. (DP.) d.—On tree, DePauw University Arboretum, Greencastle, Putnam County. Coll. Clark Nattkemper, 1936. Det. Torrey. (DP.)

*Parmelia saxatilis* (L.) Ach.—Fern, Putnam County. Coll. and det. L. M. Underwood, April, 1893. Checked, Herre. Usneaceae. (DP.)

*Ramalina calicaris* (L.) Röhring—Greencastle, Putnam County. Det. Herre. (DP.)

*Ramalina fraxinea* (L.) Ach.—On fence posts, Union County. Fink.

*Ramalina subamplicata* (Nyl.) Fink—Fern, Putnam County. Coll. L. M. Underwood, April, 1891. Det. Herre. Distributed by Underwood as *R. calicaris*. (DP.)

*Usnea dasypoga* (Ach.) Röhring var. *plicata* (L.) Crombie—Beanblossom Woods, northwest of Bloomington, Monroe County, at Griffy Creek Bridge. Coll. Welch, No. 1931. Det. Herre. (DP.)

*Usnea florida* (L.) Weber—a.—Lake Maxinkuckee, Marshall County. Coll. L. M. Underwood, Oct. 8, 1893. Det. Herre. (DP.) b.—Salt Creek Swamp, 12 miles southeast of Bloomington, Monroe County. Coll. Welch, No. 1914. Det. Herre. (DP.)

### Caloplacaceae

*Caloplaca flavovirescens* Arnold: Wulf.—On rocks, “Indiana.” Fink in Lichen Flora.

*Caloplaca microphyllina* (Tuck.) Hasse—On fences, Montgomery and Union Counties. Fink.

*Caloplaca oxfordensis* Fink: Hedrick—First falls around bend opposite the cascades, north of Bloomington, Monroe County. Coll. Welch, No. 1930. Det. Herre. (DP.) A notable find, as it has hitherto been known only from the type locality at Oxford, Ohio.

*Caloplaca pyracea* (Ach.) Th. Fries—On dead roots, Montgomery County. Fink.

*Caloplaca sideritis* (Tuck.) A. Zahlbr.—On limestone boulders, Franklin, Montgomery, and Putnam Counties. Fink.

*Caloplaca ulmorum* Fink—On trees, Tippecanoe County. Fink.

*Caloplaca variabilis* (Pers.) Müll. Arg.—On exposed limestone boulder, Franklin County. Fink.

### Teloschistaceae

*Xanthoria candelaria* (L.) Kickx.—On maples, Montgomery County. Fink, as *Teloschistes lychnus*.

*Xanthoria candelaria* var. *laciniosa* (Duf.) Arnold—On tree trunk in pasture, south of Vandalia railroad station, near Greencastle, Putnam County. Coll. Welch, No. 1929. Det. Herre. Spores 5-7 by 11-16  $\mu$ . (DP.)

*Xanthoria parietina* (L.) Beltr.—On tree trunk in pasture, south of Vandalia railroad station, near Greencastle, Putnam County. Coll. Welch, No. 1929 and No. 7565. Det. Herre. (DP.)

### Buelliaceae

*Buellia punctata* (Hoffm.) Mass.—On board fences and telephone poles, Franklin, Montgomery, and Union Counties. Fink, as *Buellia myriocarpa*.

*Rinodina ocellata* (Hoffm.) Arnold—On rocks in Crawford's Woods, Montgomery County. Fink, as *Rinodina lecanorina*.

### Physciaceae

*Pyxine sorediata* (Ach.) E. Fries—On old logs along creek, Montgomery County. Fink.

*Physcia clementiana* (Ach.) Kickx.—a.—On walnut trees, Franklin and Montgomery Counties. Det. Fink. b.—On rock, near Bloomington, Monroe County. Det. Herre. (DP.)

*Physcia endochrysea* (Hampe) Nyl.—On trees and rocks, Franklin, Monroe, and Montgomery Counties. Fink.

*Physcia leucoleiptes* (Tuck.) Lettau—On trees, Franklin, Monroe, and Montgomery Counties. Fink.

*Physcia obscura* (Ehrh.) Hampe—On trees, Franklin, Montgomery, and Union Counties. Fink.

*Physcia pulverulenta* (Schreber) Nyl.—a.—On trees, stumps, and fences, Franklin, Montgomery, and Union Counties. Fink.

*Physcia setosa* (Ach.) Nyl.—On a tree trunk, east of Vernon, along Muscatatuck River, Jennings County. Coll. Welch, No. 7461. Det. Herre. (DP.)

*Physcia stellaris* (L.) Nyl.—On a tree trunk, near Bloomington, Monroe County. Coll. Welch, No. 7432. Det. Herre. (DP.)

*Physcia tribacia* (Ach.) Nyl.—a.—On old posts and on trees, especially near base of trunk, Hendricks, Montgomery, Parke, and Union Counties. Fink. b.—On a tree trunk, near Bloomington, Monroe County. Coll. Welch, No. 7433. Det. Herre. (DP.)

*Physcia virella* (Ach.) Flagey—a.—Running over mosses on limestone cliffs, one-half mile north of Vernon, along North Fork of Muscatatuck River, Jennings County. Coll. Welch, Nos. 7435, 7437, and 7442. All det. Herre. (DP.) b.—On trunk of ash tree, in pasture south of Greencastle, Putnam County. Coll. Welch, No. 7841. Det. Herre. (DP.)

*Anaptychia fusca* (Hudson) Wainio—On trees, Montgomery County. Fink, as *Physcia aquila*.