WORKING DRAFT
of the
LICHENS OF THE SOUTHERN LAKE MICHIGAN REGION

[For classroom use only]

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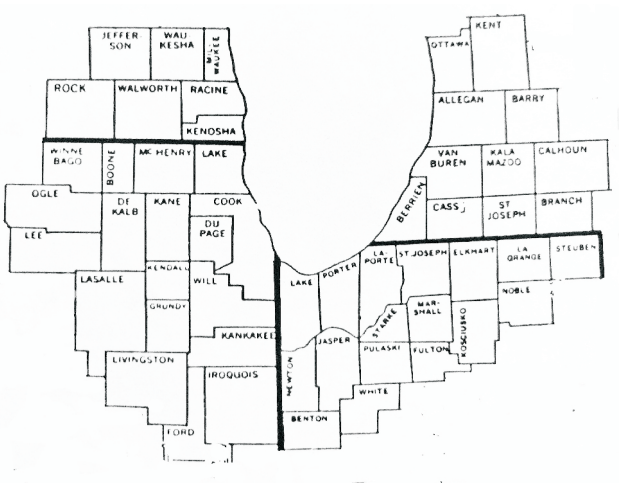
INTRODUCTION



The 53-county Southern Lake Michigan Region as defined in this lichen flora is somewhat larger than the 22-county area circumscribed by Wilhelm & Rericha (2017) for the Chicago Region and which has been the area included in previous unpublished iterations of this effort.

The Southern Lake Michigan Region includes the Michigan counties of Allegan, Barry, Berrien, Branch, Calhoun, Cass, Kalamazoo, Kent, Ottawa, St. Joseph, and Van Buren; Jefferson, Kenosha, Milwaukee, Racine, Rock, Walworth, and Waukesha, counties in Wisconsin; Boone, Cook, DeKalb, DuPage, Ford, Grundy, Iroquois, Kane, Kankakee, Kendall, Lake, LaSalle, Lee, Livingston, McHenry, Ogle, Will, and Winnebago counties in Illinois; and Benton, Elkhart, Fulton, Jasper, Kosciusko, Lake, LaGrange, LaPorte, Marshall, Newton, Noble, Porter, Pulaski, St. Joseph, Starke, Steuben, and White counties in Indiana. These 53 counties in four states comprise the region around the southern end of Lake Michigan.

This region is entirely within the area covered by the latter stages of the continental glacier that had receded fully from the landscape after the last emptying of the remnants of Glacial Lake Chicago, Lake Algoma, about 3,000 years ago. The oldest landscape in the region is in the northwestern region, which has been without ice for a little more than 75,000 years. Illinois Beach State Park, was fully formed in its present condition fewer than 2,000 years ago.

The Southern Lake Michigan region borders American Beech forests with eastern affinities, includes bogs with northern affinities, lake plains with Atlantic coast affinities, and prairie with western affinities. With regard to saxicolous habitats, lichen substrates include a few breaks and pavements of dolomite, siliceous erratics, dolomitic boulders, and carbonate-rich man-made

aggregates. There is a diverse array of corticolous substrates, probably far more diverse and frequently disposed than was the case at the time of settlement.

For all that, the Southern Lake Michigan Region could hardly be described as the garden spot of the world's lichens. Nowhere do lichens festoon every possible substrate such as is one can see in parts of southern Illinois and Indiana, the Ozarks, and the northern districts of Michigan and Wisconsin. The region at the time of settlement was prevailingly perennial grassland with inclusions of savannah, open woods and duneland. There are large guilds of southern and southeastern species that are missing from our flora as well as large guilds of boreal and northeastern species. Nevertheless, Calkins (1896), who first provided a compendium on the lichens of "Chicago and Vicinity" noted that "this territory might be . . . sufficiently large to furnish and attractive field and ample material for the investigation and study of lichens, . . ." He lamented, however, that:

> "*. . . with the exception of the most common species, a few of which are cosmopolitan in their habits, the explorer will meet with a disappointment not to be experienced further south and west in regions where the conditions of the soil, the geological features of the country, and the climate favor a larger development of species . . . However, . . . enough varieties occur [locally] to form an excellent preliminary course of study [when the student] has become familiar with the* Parmelias *and* Physcias *which are so abundant on oaks and other trees along the lake shore and in the 'wooded islands of the prairies*."

The Southern Lake Michigan Region, of course, by 1896, had come to include one of the great metropolitan regions of North America, replete with the ubiquitous combustion of coal and its sulfur-rich effusions. Tillage agriculture and heavy grazing dominated the purlieus to urban edifice and structure. Much tree-planting had occurred throughout the rural populated districts. Calkins was compelled to apologize for the ostensibly depauperate nature of the Chicago lichen flora, having believed it once to have been notably richer:

> "*Localities in and around Chicago formerly rich in lichenose vegetation are now destitute of it. The species were and are mostly corticolous, with a few on rocks, where exposed, and even on the boulders of the prairies. But the tidal waves of civilization have changed the conditions under which lichens grow, and to find them abundantly we must seek the country where the air on which they feed is pure and substrates suitable.*"

Chicago and vicinity, as Calkins described, it included significantly less area than this flora encompasses. It included all of Cook and DuPage counties, a sliver of Kane County, and the northern 8 townships of Will County, all in Illinois, and the northern half of Lake County, Indiana. Wilhelm (1998), one hundred years later, as best as one could given the changes in taxonomy and nomenclature that had occurred, compared the flora as he recorded it from the same region described by Calkins. As Wilhelm interpreted it, Calkins had reported 125 species in 1896 and that 147 species that had been discovered in the same area during the last decade of the Twentieth Century. Of the contemporary coterie of species, only 71 were in the area at turn of the previous century. Wilhelm concluded that while simple diversity had not declined over the

century, there were definite indications that significant changes had occurred in composition and physiognomy. Many species were no longer evident; some others appeared to have entered the flora in more recent times. Larger foliose and fruticose lichens, which were considered common by Calkins, had been replaced by small-foliose and crustose species; lichenized fungi with cyanobacterial photobionts also appeared to have much diminished over the century, particularly in the era following World War II.

Due to rather intensive surveys over the last 25 years, many more lichens have been collected in those same counties. Some of these specimens vindicate earlier reports of Calkins, but many others reflect a more recent origin in the region. The species composition of the lichen flora continues to change. This flora of the 53-county region presents 506 species of ascomycetous fungi recognized at present time, most of which are lichenized. The central Midwest states have been poorly collected to it is yet unclear as to which species known from neighboring districts are here but unknown. For this reason, we are including species reported from ambient areas to alert local students of their local significance should they encounter them. Such species have been keyed out and included with short descriptions. Evidence of residency in the region is characterized four ways:

- 336 lichens are represented by at least one record in the herbarium at the Morton Arboretum (MOR), most of which were collected within the last 35 years. We believe that several of these are yet to be described and have given them herbarium names.
- Another 54 are known only from some other herbarium, which is signified in the county distribution summaries for each species by its Index Herbariorum acronym.
- Yet another 22 are reasonably reliable literature records for which voucher specimens have not yet been discovered.
- 93 species presented from just outside the region are included in order to alert students of the flora of their presence should they discover them locally and to make the flora a little more useful to lichenologists near the southern portion of Lake Michigan.

At this writing, no species have been documented from all 53 counties. The occurrence of lichens locally is uneven, based at this point on the fact that the visitation by lichenologist is greatly uneven. While DuPage and Cook counties each have more than 190 species documented, St. Joseph County, Michigan has never been visited; seven counties have fewer then ten species recorded. The most frequently vouchered lichens include *Candelaria concolor, Chrysothrix caesia, Cladonia cristatella, Flavoparmelia caperata, Myriolecis dispersa, Parmelia sulcata, Phaeophyscia rubropulchra, Physcia millegrana, Physcia stellaris, Punctelia bolliana*, and *Punctelia rudecta.*

THE SOUTHERN LAKE MICHIGAN REGION FLORA

Of the 404 species known from the 53-county region, with the exception of about 35 species (9%) that can be described as frequent or common, most of our lichens can be said to be uncommon or rare. Some of these uncommon species, such as *Canoparmelia texana* and *Teloschistes exilis* are likely to be wholly adventive in the region. It is known that certain common species, such as *Xanthocarpia feracissima*, are found locally almost exclusively on weathered concrete and flagstone, and that others, such as *Caloplaca microphyllina* and *Amandinea punctata,* have exploited

weathered fence rails and old wood. They are probably far more common in the Southern Lake Michigan region today than they were in presettlement times, but to declare them allochthonous elements is risky, given the quality of our baseline information. Until more is known about the native ranges of our species, we have largely resisted the temptation to speculate on which species are native and which are not.

Several non-lichenized ascomycetous genera are included here because they are regularly collected with lichens, look like lichens, and generally are not treated as a group elsewhere: *Didymosphaeria, Hysterium, Hysterobrevium, Hysterographium, Julella, Kirschsteiniothelia, Mycocalicium, Mycoglaena, Mycoporum, Naetrocymbe,* and *Phaeocalicium*. Indeed some ascomycetous genera, such as *Arthonia*, have both lichinized and non-lichenized species; all of the local species of facultatively lichenized genera are treated here.

The flora begins with an artificial key to the families and is followed by an even more artificial key to the genera. The latter is followed by an alphabetical catalog of the genera and their species; keys to the species immediately follow the genus entry. Family keys to genera are intercalated alphabetically within the text. For each genus, the family is listed, along with the known photobiont; a brief description of the spores is also provided. The nomenclature approximates that given in Esslinger (2016) as are the authors and their orthography.

For each species, there is a list of counties from which the lichen is known. Counties for which there are either herbarium records or literature citations are shown in lower case and underscored; those known only from literature reports are rendered without underlining. In the instances where Calkins (1896) did not mention a county location, but described a lichen's distribution as "common throughout our area" or something to that effect, we have taken the liberty of assuming that he at least had seen the alleged lichen in Cook County. The NY code refers to the New York Botanical Garden, wherein there is set of Calkins's *exsiccati,* which Richard Harris examined in 1992 during his review of an early version of this flora; all NY designations represent his determinations. It would seem that the numbers on the set at the New York Botanical Garden do not correspond to those of the set at the University of Illinois, the latter of which still requires contemporary inspection.

In addition to the valid lichen names applied to greater Southern Lake Michigan Region lichens, there are numerous synonyms, misapplied names, and orthographic anomalies that we have, perhaps too cavalierly, subsumed under a more valid name or closely allied taxon. In some instances, these names may be misidentifications or legitimate older names that are known now to have narrower distributions or species circumscriptions. In other instances they may be related species or names relevant to taxonomic problems that are discussed. All of these names appear in the "Index of Synonyms and Misapplied Names" section and are indexed to the species under which they are discussed.

Lichens known to us from districts near the Southern Lake Michigan Region, but not known to be within the 53-county region, have their names presented in ***bold italics***. We have not generally included species confined to the unglaciated districts of southern Illinois or Indiana nor those from the boreal districts of Wisconsin or Michigan.

For each taxon, we have attempted to provide an etymology. Such information on lichen names is scant in the literature. Rarely do lichenologists explain the origin of epithets when they name a species. Yet, very often the epithet is descriptive of the lichen, and knowing the linguistic roots can be interesting as well as informative. Frequently, notable lichenologists have been honored in a lichen name, but if no one notes who the person was, the honor is empty. In some cases, the epithet might even seem nonsensical, or its origin ambiguous. To wit, for quite a while we had blithely assumed that for *Cladonia rei*, the epithet was some recondite derivation of the Latin noun *res, rei*, a word of such complexity that it used to give the author fits in Latin translation. Actually it is an honorific derivative of an Italian botanist by the name of Goiovani Re! Necessarily, our interpretations of epithet origin are sometimes fanciful, derived from a certain experience with the lichen and a limited knowledge of Greek and Latin. Except for obvious cases where the meaning seems certain, we must assure the reader that we have had no more access to the mind of the one who named it than readily available sources can provide. The etymological remarks are offered with the idea that fellow lichenologists will proffer suggestions or emendations.

Lichen Substrates and Habitats

Locally, the prevailing substrates for lichenized fungi are corticolous and lignicolous species that grow on the bark and wood of trees, but there are significant occurrences of saxicolous species on both siliceous, base-rich rocks, and concrete. Less frequent are terricolous species that grow on sand and clayey till. Rather rare are muscicolous, lichenicolous, and fungicolous species that grow on mosses, other lichens, and other fungi. We have also seen some wayward lichens with facultative occurrences on old clothing, iron, and other unlikely substrates.

Corticolous and Lignicolous Lichens

Tree Bark is the most abundant habitat for lichens locally, inhabitated ubiquitously by *Amandinea dakotensis, Candelaria concolor, Candelariella efflorescens, Chrysothrix caesia, Hyperphyscia adglutinata, Parmelia sulcata, Parmotrema reticulatum, Phaeophyscia ciliata, Phaeophyscia pusilloides, Phaeophyscia rubropulchra, Physcia millegrana, Physcia stellaris, Physciella chloantha, Physconia leucoleiptes, Xanthomendosa fallax*, and *Xanthomendosa fulva*. Frequent species include *Amandinea punctata, Arthonia dispersa, Flavoparmelia caperata, Flavopunctelia flaventior, Flavopunctelia soredica, Lecanora symmicta, Lepraria finkii, Melanelixia subaurifera, Myelochroa aurulenta, Phaeophyscia hirsuta, Phaephyscia kairamoi, Physcia adscendens, Physcia aipolia, Punctelia rudecta, Scoliciosporum chlorococcum, Xanthomendoza ulophyllodes*, and *Xanthomendoza weberi*. Infrequent corticolous species include *Evernia mesomorpha, Hyperphyscia syncolla, Lecanora hybocarpa, Lecania croatica, Lecanora strobilina, Lepraria caesiella, Physcia americana, Punctelia bolliana, Punctelia missouriensis*, and *Xanthomendoza hasseana*. At the bases of trees in wooded areas, often among mosses such as *Anomodon attenuatus*, frequent inhabitants include *Cladonia caespiticia, Cladonia cryptochlorophaea, Cladonia grayi, Cladonia ochrochlora, Cladonia ramulosa, Cladonia rei*, and *Phaeophyscia rubropulchra*.

Decorticate and decaying logs in wooded areas are frequently inhabited by frequently by *Cladonia chlorophaea, Cladonia cristatella, Cladonia grayi, Cladonia macilenta bacillaris*, and *Cladonia rei*; less frequently by *Cladonia coniocraea, Cladonia cryptochlorophaea, Cladonia cylindrica, Cladona didyma, Cladonia fimbriata, Cladonia ochrochlora, Cladonia parasitica, Cladonia ramulosa, Cladonia squamosa, Placynthiella icmalea, Trapeliopsis flexuosa*, and *Trapeliopsis granulosa*.

Frence Rails, untreated, and weathered wood made, usually either of *Juniperus virginiana* or *Maclura pomifera*, are inhabited frequently by *Amandinea punctata, Athallia holocarpa, Athallia pyracea, Caloplaca microphyllina, Candelaria concolor, Cladonia cristatella, Cladonia macilenta bacillaris, Cyphelium tigillare, Flavoparmelia caperata, Lecanora saligna, Lecanora strobilina, Lecanora symmicta, Melanelixia subaurifera, Myriolecis hagenii, Placynthiella icmalea, Parmelia sulcata, Phaeophysica ciliata, Phaeophyscia pusilloides, Physcia millegrana, Physcia stellaris, Trapeliopsis flexuosa, Trapeliopsis granulosa*, and *Xanthomendoza hasseana*; less frequently by *Micarea prasina, Pyrrhospora varians, Ramalina americana*, and *Thelocarpon laureri*.

Locally, some lichens have shown a proclivity for certain trees. For example we have only seen *Arthothelium spectabile, Julella fallaciosa*, and *Lithothelium septemseptata* on *Acer saccharum*, with *Julella fallaciosa* regularly on *Quercus alba*. *Constrictolumina cinchonae* and *Leptorhaphis epidermidis* have only be taken from species of *Betula*. *Carya ovata* regularly is inhabited by *Arthonia radiata, Graphis scripta,* and *Pertusaria pustulata*; less often by *Lecanora thysanophora, Pertusaria macounii, Rinodina freyi*, and *Strigula americana*. *Anisomeridium biforme, Anisomeridium polypori, Arthonia atra, Hypocenomyce scalaris, Lecanora thysanophora*, and *Punctelia caseana* are most often on *Quercus alba* or *Quercus macrocarpa*; *Arthonia dispersa, Arthonia radiata, Athallia pyracea, Candelariella xanthostigma, Lecanora thysanophora*, and *Pertusaria pustulata* are characteristic of the bark of *Quercus rubra* or *Quercus velutina*.

Saxicolous Lichens

The prevailing saxicolous substrates locally are exposed or shaded dolomitic exposures, flagstone, and weathered concrete; other base-rich substrates include pebbles. Less frequent are sandstone outcrops and granitic erratics.

Concrete, weathered for several years, is our commonest base-rich substrate. The more ubiquitous lichens include *Bacidia egenula, Candelariella aurella, Endocarpon petrolepideum, Myriolecis dispersa, Physcia adscendens, Protoparmeliopsis muralis, Squamulea subsoluta, Xanthocarpia crenulatella, Xanthocarpia ferracissima*, and *Verrucaria calkinsiana*. Commonly, these are accompanied by erstwhile corticolous species, including *Candelaria concolor, Phaeophyscia pusilloides, Physicia millegrana*, and *Physciella chloantha*. Less frequent lichens on concrete include *Athallia vitellinula, Gyalolechia flavovirescens, Lecania perproxima, Rusavskia elegans, Thelidium zwackhii*, and *Verrucaria muralis*.

Limestone, prevailingly dolomite, is the most frequent aboriginal saxicolous substrate locally. In addition to the species mentioed for concrete, the more frequent lichens on exposed surfaces

include *Acarospora strigata, Phaeophyscia kairamoi, Placynthium nigrum, Polysporina simplex, Sarcogyne regularis, Verrucaria fayettensis, Verrucaria nigrescentoidea,* and *Verricaria sordida*. Lichens of more shaded carbonate rock include *Bilimbia sabuletorum, Botryolepraria lesdainii, Dermatocarpon muhlenbergii, Dermatocarpon multifolium, Flavoplaca citrina, Phaeophyscia adiastola,* and *Psorotichia schaereri,* . Much less frequent include *Circinaria contorta, Enchylium bachmanianum, Endocarpon pallidulum, Leptogium cyanescens, Scytinium dactylinum*, and *Willeya diffractella*.

Related to lichens of base-rich rock are those that grow on pebbles of base-rich rock, associated with exposed dolomite and usually admixed with calcareous sand in dry prairies where vascular vegetation is sparse. These lichens include *Dermatocarpon dolomiticum, Endocarpon pallidulum, Heppia conchiloba, Placidium squamulosum*, and *Psora decipiens*. A unique variant of this community is the lake plain prairies at Illinois Beach State Park, in Lake County, Illinois, where, on stable sand and gravel grow *Cetraria arenaria, Cladonia cylindrica, Cladonia homosekikaica, Cladonia robbinsii, Cladonia subcariosa, Diploschistes muscorum, Heppia conchiloba, Placidium squamulosum*, and *Psora decipiens*.

Granitic Erratics with lichens are usually exposed, the more common species being *Acarospora fuscata, Acarospora veronensis, Circinaria caesiocinerea, Dimelaena oreina, Physcia dakotensis, Physcia thomsoniana, Protoparmeliopsis muralis, Trapelia coarctata, Xanthocarpia crenulatella,* and *Xanthoparmelia cumberlandia.* Less frequent are *Acarospora americana, Lichenothelia scopularia, Physcia subtilis, Rinodina cana, Rinodina destituta, Rufoplaca oxfordensis, Scoliciosporum umbrinum, Trapelia glebulosa, Xanthoparmelia mexicana,* and *Xanthoparmelia plittii*.

Sandstone, largely confined to our western sector, exposed surfaces are most frequently inhabited by *Acarospora fuscata, Trapelia coarctata*, and *Xanthoparmelia cumberlandia*; less frequently, *Buellia badia, Cladonia atlantica, Diploschistes scruposus, Endocarpon pallidulum, Lepraria neglecta, Porpidia crustulata, Porpidia subsimplex, Stereocaulon saxatile, Rhizoplaca subdiscrepans, Rinodina cana, Trapelia glebulosa, Xanthoparmelia australasica, Xanthoparmelia mexicana*, and *Xanthoparmelia plittii*. More shaded surfaces are inhabited by *Dermatocarpon miniatum, Lepraria hodkinsoniana, Cladonia dimorphoclada*, and *Phaeophyscia insignis*; much less so my by *Lepraria vouauxii, Psilolechia lucida,* and *Sarcogyne simplex*.

Terricolous and Muscicolous Lichens

Sandy Soil is the habitat for numerous species of lichens, most commonly *Cladina subtenuis, Cladonia chlorophaea, Cladonia cristatella, Cladonia cryptochlorophaea, Cladonia furcata, Cladonia grayi, Cladonia rei, Cladonia subcariosa*, and *Peltigera rufescens*. Less frequent are *Cladina arbuscula, Cladina mitis, Cladina rangiferina, Cladonia atlantica, Cladonia conista, Cladonia piedmontensis, Cladonia pleurota, Cladonia pyxidata, Cladonia robbinsii, Cladonia sobolescens, Cladonia strepsilis, Cladonia symphycarpa, Diploschistes scruposus, Peltigera didactyla, Peltigera evansii, Peltigera praetextata,* and *Placynthiella uliginosa*.

Clayey Soils of the till plain, well leached and in areas where vascular vegetation is sparse, include commonly *Cladonia chlorophaea, Cladonia cristatella, Cladonia cryptochlorophaea, Cladonia furcata, Cladonia grayi, Cladonia peziziformis, Cladonia rei, Cladonia subcariosa,* and *Peltigera rufescens*. Less frequent lichens include *Cladina subtenuis, Cladonia fimbriata, Diploschistes scruposus*, and *Placidium squamulosum*.

Mosses are uncommonly inhabited by *Bacidia bagliettoana, Bilimbia sabuletorum*, and much less so by *Bryobilimbia hypnorum.*

Photobionts of the Lichens of the Southern Lake Michigan Region

With respect to the taxonomy of lichenized fungi, little attention has accrued to the photobiont, inasmuch as lichen taxa are organized prevailingly around the morphology of the fungal ascoma, spores, and thallus. Most lichens that have amyloid hymenia are associated with *Trebouxia* species; most of those with non-amyloid hymenia are lichenized with species of *Trentepohlia.* Both genera are Chlorophycean algae. Frequently, the identification of algae associated with lichenized fungi is difficult, because the morphologies of algal species, although fairly distinct when cultured on agar, are frequently modified significantly when in association with a lichenized fungus. For instance, cells of filamentous genera frequently become solitary, and sometimes the chromatophore takes on quite a different aspect. In many apothecial or algal layer sections, several genera of algae other than the known photobiont can be observed, but a physical association with the fungal hyphae is difficult to verify. More than one genus of photobiont may be noted for a lichen genus. This does not mean that this is the case for all species in the genus or that it is routinely applicable for Southern Lake Michigan Region species. Neither does it mean that there are no other gonidia [photobionts] involved. The following is a key to the photobiont genera known from lichens presented here; it is adapted from Ahmadjian's (1967) descriptions, although we are in the process of bringing the photobiont delineations up to date. For a recondite treatment of photobionts in the Verrucariaceae see Thüs *et al.* (2011). For a breakdown of the *Trentepholialean* genera see Hametner (2014).

1. Photobiont blue-green.
    2. Cells in paired or gelatinous clusters
        3. Cells in uniformly paired units.
            Units simply 2-celled. . . . . *Chroococcus*
            Units in multiples of paired cells.. . . . . *Chroococcidiopsis*
        3. Cells not uniformly paired.
            Gelatinous envelopes yellowish brown. . . . . *Xanthocapsa*
            Gelatinous envelopes hyaline.. . . . . *Gloeocapsa*
    2. Cells end-to-end in filaments or chains.
        4. Cells spherical, in beadlike chains.. . . . . *Nostoc*
        4. Cells cylindrical, in filaments.
            5. Filaments mostly 2–4 cells thick. . . . . *Stigonema*
            5. Filaments 1 cell thick.
                Heterocysts basal, branches tending to attenuate from base to apex. . . . . *Dichothrix*
                Heterocysts within the filaments, branches not much attenuate. . . . . *Scytonema*
1. Photobiont green.

6. Larger cells more than 16 μm long.
   Droplets of orange red pigment usually apparent in the chromatophore; cells irregularly cylindric to ovoid (incl. *Printzina*). . . . . *Trentepohlia*
   Reddish pigments absent; cells spherical to oval (incl. *Myrmecia* & *Asterochloris*). . . . . *Trebouxia*
6. Larger cells up to 16 μm long (chlorococcoid).
   7. Cells elongate, sausage-shaped (incl. *Diplosphaera*). . . . . *Stichococcus*
   7. Cells spherical to ovoid.
      8. Cells mostly 2–4 in packets. . . . . *Protococcus*
      8. Cells solitary or in short filaments.
         9. Cells rarely more than 5 µm in diameter. . . . . *Hyalococcus*
         9. Cells mostly more than 5 µm in diameter.
            10. Chromatophore irregularly folded. . . . . *Myrmecia*
            10. Chromatophore lining the cell wall, cup-shaped or platelike.
               11. Chromatophore lining most of the inner cell wall. . . . . Chlorococcoid; *Chlorella*
               11. Large portions of the inner cell wall exposed.
                  Chromatophore cup-shaped. . . . . *Coccomyxa*
                  Chromatophore platelike or bowl-like. . . . . *Pseudochlorella*

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ARTIFICIAL KEY TO THE FAMILIES

The following key attempts to help the reader organize lichen genera into related or seemingly related groups. Natural ordinations of lichen phylogeny, particularly with regard to morphological features, remains elusive, so the families presented here must be regarded as representing provisional relationships. For specimens with mature ascocarps, however, it represents and alternative approach to the keys to the genera. For sterile specimens, we refer the user to the latter key, though our local flora has produced many unidentifiable (to us) collections. Such is the state of the art at the floristic level.

A. Ascospores too numerous to count; or the apothecium long-stalked and the asci 8-spored. (Sterile lichens are more likely to be identified through use of the key to genera.)
  B. Asci disintegrating into a mazaedial mass.
    Mazaedial mass black; spores notable longer than wide.. . . . . **CALICIACEAE**
    Mazaedial mass not black; spores nearly or quite globose. . . . . **CONIOCYBACEAE**
  B. Asci not forming a mazaedium (or asci disintegrating in age, but evident early on).
    C. Ascospores curved, or if not then the ascocarps parasitic
      Ascoma a parasitic in the apothecia of Teloschistaceous lichens. . . . . **VERRUCARIACEAE**
      Ascoma not parasitic. . . . . **PARMELIACEAE**
    C. Ascospores not curved, never parasitic.
      D. Exciple not thalloid, without algae
        Apothecium stalked. . . . . **MYCOCALICIACEAE**
        Apothecium sessile. . . . . **BIATORELLACEAE**
      D. Exciple thalloid, with an algal component.
        Thallus absent; apothecium bright yellow, opening by a tiny pore. . . . . **THELOCARPACEAE**
        Thallus present, or if not evident then apothecium not bright yellow. . . **ACAROSPORACEAE**

A. Ascospores no more than 64 per ascus; apothecium never long-stalked.
  E. Ascocarp a perithecium, opening through a distal pore.
    F. Paraphyses, absent, unbranched, or very coarse and difficult to discern.
      G. Paraphyses distinctly unbranched, or soon reduced to a hymenial gel.
        Paraphyses present. . . . . **STRIGULACEAE**
        Paraphyses absent. . . . . **VERRUCARIACEAE**
      G. Paraphyses obscure in structure, but neither distinctly unbranched or gelatinous.
        Hymenium inspersed with large droplets, mostly multi-chambered. . . . . **MYCOPORACEAE**
        Hymenium not inspersed, a single chamber. . . . . **NAETROCYMBACEAE**
    F. Paraphyses present, slender, and at least sparingly branched.
      H. Ascocarps imbedded in thalloid warts or heaps of powdery soredia concolorous with the thallus.
        Ascospores septate. . . . . **TRYPETHELIACEAE**
        Ascospores simple. . . . . **PERTUSARIACEAE**
      H. Ascocarps not imbedded in thalloid warts or heaps of powdery soredia-like masses.
        I. Ascospore walls notably thickened. . . . . **PYRENULACEAE**
        I. Ascospore walls not notably thickened.
          J. Ascospores becoming brown.
            K. Ascospores several-septate to muriform. . . . . **DECAMPIACEAE**
            K. Ascospores 1-septate.
              Ascospores notably constricted at the septum, the cells usually unequal in size. . . . . **PLEOSPORACEAE**
              Ascospores not notably constricted at the septum, the cells subequal in size. . . . .

. . . . . **DIDYMOSPHAERIACEAE**

J. Ascospores persistently hyaline.

L. Ascospores muriform; photobiont absent

Ascomata black throughout. . . . . **TRYPETHELIACEAE**

Ascomata with blue-green walls. . . . . **MICROPELTIDACEAE**

L. Ascospores not muriform; photobiont usually present.

M. Photobiont blue-green or absent

Photobiont absent. . . . . **ARTHOPYRENIACEAE**

Photobiont blue-green. . . . . **XANTHOPYRENACEAE**

M. Photobiont green.

N. Spores simple. . . . . **THROMBIACEAE**

N. Spores septate.

Ascospores commonly more than 3-septate. . . . . **PORINACEAE**

Ascospores 1–3 septate. . . . . **MONOBLASTIACEAE**

E. Ascocarps diskiform (obscurely so in the STICTIDACEAE, which has elongate, vermiform ascospores with contractions at the septa) Most sterile species are in families found here.

O. Photobiont blue-green.

P. Thallus filamentous suffruticose.

Photobiont *Stigonema*; filamentous branches not pubescent.. . . . . **COCCOCARPIACEAE**

Photobiont not *Stigonema*; filamentous branches pubescent.. . . . . **LOBARIACEAE**

P. Thallus not filamentous suffruticose.

Q. Thallus crustose, squamulose, or fruticose

Thallus crustose, black, with a blue-green hypothallus; ascospores 1–3 septate.. . . . . **PLACYNTHIACEAE**

Thallus variously squamulose, fruticose, or crustose, but without a blue-green hypothallus; ascospores simple. . . . . **LICHINACEAE**

Q. Thallus foliose.

R. Thallus gray or nigrescent, gelatinous when wet.. . . . . **COLLEMATACEAE**

R. Thallus brown, not gelatinous when wet.

Medulla with secondary metabolites, either K+ yellow or C+ rose. . **LOBARIACEAE**

Medulla without secondary metabolites, K– and C–. . . . . **PELTIGERACEAE**

O. Photobiont green [sterile specimens are more likely to be determined through use of the Artificial Key to the Genera.]

S. Thallus foliose and rhizinate or distinctly squamulose, with and upper and lower cortices, or fruticose with simple or branched podetia or branches; never yellow or orange, or thallus black and minutely fruticose.

T. Ascospores simple, hyaline.

U. Thallus foliose or with fruticose branches with a medullary core, or thallus black and minutely fruticose

Thallus black and minutely fruticose. . . . . **RACODIACEAE**

Thallus variously colored, but not minutely fruticose. . . . . **PARMELIACEAE**

U. Thallus squamulose, any podetia with a hollow core

Squamules lying flat upon the substrate an imbricate over others, the margins with labriform soralia [see also the PSORACEAE]. . . . . **OPHIOPARMACEAE**

Squamules erect or ascending, the margins esorediate or with poorly delimited soralia . . . . . **CLADONIACEAE**

T. Ascospores septate, often hyaline or brown.

V. Thallus fruticose.

Thallus of flattened lobes or branches.. . . . . **RAMALINACEAE**

Thallus lobes not distinctly flattened. . . . . **STEREOCAULACEAE**

V. Thallus foliose.

W. Lower surface a close, felt-like indument. . . . . **PELTIGERACEAE**

W. Lower surface without a felt-like indument.

Lower cortex white; medulla orange or salmon. . . . . **CALICIACEAE**

Lower cortex white, brown ,or black; medulla white or red. . . . **PHYSCIACEAE**

S. Thallus neither foliose nor distinctly squamulose or fruticose, or if so then the thallus distinctly yellow or orange.

X. Thallus or apothecial disks distinctly yellow or some shade of orange; exciple thalloid.

Y. Thallus bright yellow; fruticose.. . . . . **PARMELIACEAE**

Y. Thallus yellow or some shade of orange, fruticose or not.

Z. Apothecial disks and/or the thallus K+ deep purple [anthraquinones] ascospores thick-walled. . . . . **TELOSCHISTACEAE**

Z. Apothecial disks and thallus not K+ deep purple; ascospores thin-walled.

A1. Soredia granular, organized into soralia, or soredia absent.. . . . . .

Ascospores hyaline. . . . . **CANDELARIACEAE**

Ascospores brown.. . . . . **CALICIACEAE**

A1. Soredia fine, diffuse, not in organized soralia.

Rhizocarpic acid present.. . . . . **PSILOLECHIACEAE**

Rhizocarpic acid absent. . . . . **CHRYSOTHRICACEAE**

X. Neither thallus nor apothecial disks distinctly yellow or orange, or if the apothecium rarely so then the exciple not thalloid.

B1. Ascospores simple, hyaline.

C1. Exciple thalloid, with an algal component.

D1. Ascospore walls thick.. . . . . **PERTUSARIACEAE**

D1. Ascospore walls thin.

E1. Ascospores less than 15 μm long. . . . . **LECANORACEAE**

E1. Ascospores more than 15 μm long. [fertile *Ochrolechiae* might key here although none are known locally]

Apothecial disk flat or concave, the surface at or below the surface of the thallus.. . . . . **MEGASPORACEAE**

Apothecial disks adnate, sessile, set well above the surface of the thallus .. . . . . **TRAPELIACEAE**

C1. Exciple not thalloid, without an algal component.

F1. Thallus of appressed squamules, or if crustose then the apothecium K+ deep purple . . . . . **PSORACEAE**

F1. Thallus not of appressed squamules, the apothecium not K+ purple.

G1. Axis of ascus apex not notably amyloid. . . . . **LECANORACEAE**

G1. Axis of ascus apex strongly amyloid.

I1. Photobionts in cell packets of 2, 4 or 6.

Apothecial pigments brown. . . . . **FUSCIDEACEAE**

Apothecial pigments not brown. . . . . **TRAPELIACEAE**

I1. Photobionts generally not in binary packets.

I1. Thallus not saxicolous. . . . . **LECIDEACEAE**

I1. Thallus saxicolous.

Larger apothecia more than 0.5 mm across. **PORPIDIACEAE**

Apothecia less than 0.5 mm across. . . . . **PILOCARPACEAE**

B1. Ascospores septate to muriform, hyaline, gray, or brown.

J1. Ascospores gray, brown or muriform, or both, or if hyaline then the apothecia elongate or irregular with a black exciple.
K1. Apothecia round, the exciple black or otherwise.
L1. Ascospores more than 17 μm long, muriform.
Thallus C+ red. . . . . **THELOTREMATACEAE**
Thallus C–. . . . . **RHIZOCARPACEAE**
L1. Ascospores less than 17 μm long, submuriform or merely septate.
Ascospore walls thickened, polaribilocular. . . . . **PHYSCIACEAE**
Ascospore wall thin throughout. . . . . **CALICIACEAE**
K1. Apothecia elongate or irregular, the exciple black.
M1. Ascospores with lenticular cells, the walls of the septa much thicker near the spore wall; apothecia irregular, often branched or elongating; hymenium IKI–; ascospores usually IKI+ bluish black. . . . . **GRAPHIDACEAE**
M1. Ascospores with cylindrical cells; apothecia more or less circular to oblong, to simply forked; hymenium IKI+; ascospores IKI+ blue to orange.
N1. Thallus thin to evanescent, smooth, but not lichenicolous; ascospores 3-septate.
Ascospores brown, at least in two of the cells. . . **HYSTERIACEAE**
Ascospores colorless. . . . . **ARTHONIACEAE**
N1. Thallus thin to obscurely chinky or pulverulent, or lichenicolous; ascospores 3–15 septate.
Ascospores less than 5 μm wide, not including the outer hyaline sheath (perispore), if present; thallus lichenicolous or not. . . . . **OPEGRAPHIDACEAE**
Ascospores more than 5 μm wide; thallus not lichenicolous. . . . . **LECANOGRAPHACEAE**

J1. Ascospores hyaline, never muriform.
O1. Asci nearly as long as wide; paraphyses indistinct or absent.
Thallus leprose or finely granular. . . . . **CHRYSOTHRICACEA**E
Thallus not leprose; apothecia nor or only weakly pruinose. . . . . **ARTHONIACEAE**
O1. Asci notably longer than wide; paraphyses evident, distinct or intertwined.
P1. Spore walls thickened differentially, at least at the septa; apothecia with a thalloid or lecideine rim.
Ascospores vermiform, multi-septate with constrictions as the septa. . . . . **STICTIDACEAE**
Ascospores 2-celled, polaribilocular. . . . . **TELOSCHISTACEAE**
P1. Spore walls thin throughout; apothecia without a thalloid rim.
Q1. Paraphyses distinct.
Apothecia dark, the paraphyses nigrescent at the tip. . . . . **CATILLARIACEAE**
Apothecia pale, flesh-colored, the paraphyses hyaline. . . . . **COENOGONIACEAE**
P1. Paraphyses intertwined and anastomosed.
R1. Ascospores 1-septate, or if rarely 3-septate, then the ascus tip strongly amyloid. . . . . **PILOCARPACEAE**
R1. Ascospores 1-several septate, the ascus tip weakly to strongly amyloid.

S1. Ascospores notably coiled in the ascus. . . . . **SCOLICIOSPORACEAE**

S1. Ascospores straight in the ascus

Asci *Bacidia*-type. . . . . **RAMALINACEAE**

Asci not *Bacidia*-type. . . . . **LECIDEACEAE**

ARTIFICIAL KEY TO THE GENERA

The following key is a wholly artificial key to th genera, which means the associated groupings suggest no foundational morphological features, other than descriptive terms to describe them are similar. In recent years there has been a fair amount of DNA work that attempts to express phylogenetic relationships, but correlative morphological features are uncommonly presented. Those interested in such relationships must pursue that literature with a fairly robust level of experience in the anatomy and morphology of lichenized fungi.

1. Thallus subcrustose with marginal lobes to foliose, squamulose, umbilicate, or fruticose, usually with a well defined lower cortex. . . . . **GROUP I**
1. Thallus crustose, tightly adnate or enmeshed with the substrate, without defined lobes, podetia, or a lower cortex.
    2. Ascomata chronically absent, notably stalked, or the thallus and apothecia black throughout. **GROUP II**
    2. Ascomata evident, not stalked, the thallus and apothecia not black throughout.
        3. Ascoma a perithecium, the spores released through a small pore. . . . . **GROUP III**
        3. Ascoma an apothecium, the spores in asci imbedded in a disk.
            4. Apothecia irregular to elongate, never flesh-colored; thallus rudimentary, often little more than a discoloring of the substrate around the apothecia. . . . . **GROUP IV**
            4. Apothecia mostly rounded, or if somewhat irregular then flesh-colored; thallus rudimentary to well-developed.

                Exciple thalloid, with an algal component, or the apothecia K+ purple, or the apothecia imbedded in thalloid wart.. . . . . **GROUP V**

                Exciple without algae, or exciple absent; apothecia K–, never in thalloid warts. **GROUP VI**

GROUP I

THALLUS SUBCRUSTOSE WITH MARGINAL LOBES TO FOLIOSE, SQUAMULOSE, UMBILICATE, OR FRUTICOSE, USUALLY WITH A WELL DEFINED LOWER CORTEX.

1. Thallus gelatinous when wet, dark brown to black or dark slate gray; medulla absent.
    2. Thallus subcrustose, without distinct lobes; prothallus blue green and evident at the margins. . . . . PLACYNTHIUM
    2. Thallus appearing foliose or fruticose, without a blue green prothallus.
        3. Thallus pulvinate or umbilicate, usually attached at only a central point; photobiont *Gloeocapsa* or *Chroococcus*.

            Thallus fruticose, the lobes long and strap-like; usually pruinose.. . . . . THYREA

            Thallus more or less umbilicate, the lobes about as long as broad; usually epruinose. LICHINELLA
        3. Thallus attached to the substrate at several locations; photobiont *Nostoc*.
            4. Thallus with a layer of more or less isodiametric cortical cells; upper surfaces usually smooth to sub-lustrous, slate gray to brown.

                Thallus lobes less than 2.5 mm across, gray or brown. . . . . SCYTINIUM

                Thallus lobes broader, gray.. . . . . LEPTOGIUM
            4. Thallus lacking an organized cortex, the hyphae interwoven; upper surfaces dull, usually olivaceous

to black.

5. Thallus dwarf fruticose; apothecia very rare.
   Thallus branches filamentous. . . . . DENDRISCOCAULON
   Thallus branches not filamentous. . . . . LEMPHOLEMMA
5. Thallus various but not dwarf fruticose; apothecia present or absent.
   6. Thallus lobes large, flat, neither thickened nor wrinkled, the larger more than 4 mm long. .. . . . . COLLEMA
   6. Thallus lobes small, thickened, wrinkled, or warty isidiate, less than 4 mm long.
      Apothecia rare; thallus gray, finely wrinkled, saxicolous. . . . . LATHAGRIUM
      Apothecia common; thallus gray to olivaceous or nigrescens, but not finely wrinkled, saxicolous, terricolous, or corticolous. . . . . ENCHYLIUM

1. Thallus not gelatinous, variously colored; medulla evident, or thallus lichenicolous.
   7. Thallus fruticose, podetiate, or of adnate to suberect squamules, or thallus lichenicolous.
      8. Thallus of adnate or appressed squamules, or thallus lichenicolous.
         9. Thallus parasitic on the lower side of *Dermatocarpon*. . . . . TONINIA
         9. Thallus not parasitic on *Dermatocarpon*.
            10. Thallus saxicolous.
               11. Ascoma an apothecium; squamules white-rimmed.
                  Squamules slate gray or olivaceous, with upturned blue-black margins. . . PSORULA
                  Squamules not slate gray, the margins appressed. . . . . PSORA
               11. Ascoma a perithecium; squamules not white-rimmed.
                  Spores non-septate. . . . . PLACIDIUM
                  Spores muriform, with horizontal and longitudinal septa. . . . . ENDOCARPON
            10. Thallus terricolous, muscicolous, or corticolous, or lichenicolous.
               12. Thallus corticolous, sorediate or esorediate. . . . . HYPOCENOMYCE
               12. Thallus not corticolous, esorediate.
                  13. Thallus brown, either with a nigrescent margin or with cortical hairs, lichenicolous or muscicolous.
                     Thallus without cortical hairs, lichenicolous on *Spilonema*. . . . . PSORULA
                     Thallus with numerous cortical hairs; muscicolous. . . . . AGONIMIA
                  13. Thallus pink, or if brown then with a pale margin or with reddish apothecia, terricolous or saxicolous.
                     Squamules brownish to olivaceous, neither pink nor sorediate; photobiont blue-green. . . . . HEPPIA
                     Squamules pinkish, brownish, or sorediate; photobiont green. . . . . PSORA
      8. Thallus various, but not of adnate squamules or appressed, never lichenicolous.
         14. Thallus crustose, the small cylindrical podetia arising from smooth, aggregated, crustose granules. . . . . PYCNOTHELIA
         14. Thallus not crustose.
            15. Thallus in part or entirely of ascending squamules.
               Squamules brown on both surfaces; perithecia present. . . . . DERMATOCARPON
               Squamules greenish or grayish above, white below; perithecia absent. . . . . CLADONIA
            15. Thallus without squamules.
               16. Thallus brown or black, at least on one surface.
                  17. Thallus of a filamentous, more or less tangled cushion or mass, saxicolous. . . . . SPILONEMA
                  17. Thallus not filamentous, or if so, the not forming a cushion or mass, corticolous or terricolous.
                     Thallus terricolous, flattened and involute-margined, P–. . . . . CETRARIA

Thallus corticolous, terete, P+ red (fumarprotocetraric acid).. . . . . BRYORIA

16. Thallus not brown.
    18. Thallus of flattened lobes or branches.
        19. Thallus K–. . . . . RAMALINA
        19. Thallus K+ deep purple
            Apothecia ciliate. . . . . TELOSCHISTES
            Apothecia eciliate. . . . . XANTHORIA
    18. Thallus of uniformly or irregularly rounded branches.
        20. Stalks or branches of thallus hollow.
            Podetia with a fibrous, dull surface. . . . . CLADINA
            Podetia with a corticate, smooth, lustrous surface. . . . . CLADONIA
        20. Stalks or branches of thallus with a central medullar core, not hollow.
            21. Thallus whitish gray, bushy-branched, the branches decorticate in some areas, otherwise covered with tiny corticate granules or squamules. . . . . STEREOCAULON
            21. Thallus yellow green, or yellow, neither bushy-branched nor beset with a granular cortex.
                22. Thallus bright yellow. . . . . LETHARIA
                22. Thallus yellow-green.
                    Fibrils evident; branches smoothly terete. . . . . USNEA
                    Fibrils absent; branches irregularly wrinkled. . . . . EVERNIA

7. Thallus adnate to loosely appressed, but distinctly foliose or umbilicate.
    23. Thallus orange, yellow, yellowish green, or yellowish gray.
        24. Cortex K+ deep purple.
            25. Thallus placoidioid and effigurate to subcrustose, all portions tightly adnate. . . . . Group II
            25. Thallus foliose to subcrustose, but at least the lobe tips elevated or loosely adnate.
                26. Thallus sorediate. . . . . XANTHOMENDOZA
                26. Thallus esorediate.
                    27. Thallus saxicolous.. . . . . RUSAVSKIA
                    27. Thallus corticolous.
                        Rhizines abundant.. . . . . XANTHOMENDOZA
                        Rhizines absent. . . . . XANTHORIA
        24 Cortex K– or K+ yellow.
            28. Thallus with granular or powdery soredia.
                29. Thallus bright lemon yellow or yellow green; lobes small, less than 1 mm wide. . . . . CANDELARIA
                29. Thallus yellow green; lobes more than 1 mm wide.
                    30. Lobes to 3 mm across.
                        Soralia capitate; divaricatic acid present.. . . . . PARMELIOPSIS
                        Soralia not capitate; divaricatic acid absent. . . . . USNOCETRARIA
                    30. Larger lobes more than 3 mm across.
                        Medulla C+ red. . . . . FLAVOPUNCTELIA
                        Medulla C–. . . . . FLAVOPARMELIA
            28. Thallus esorediate.
                31. Larger lobes more than 1 mm wide.
                    Isidia fine, all of nearly equal size. . . . . XANTHOPARMELIA
                    Isidia coarse, of various sizes, sometimes breaking into granular pustules.. . . . . FLAVOPARMELIA
                31. Lobes less than 1 mm wide.

32. Apothecial disk bright yellow. . . . . CANDELARIA
32. Apothecial disk brown or black.
Apothecial disk brown; spores colorless. . . . . PROTOPARMELIOPSIS
Apothecial disk black; spores brown. . . . . DIMELAENA

23. Thallus without yellowish tints.
33. Thallus brown or brownish gray (rarely pale gray and umbilicate); cortex K–.
34. Lower cortex covered by a dense tomentum or matted appressed hairs, or lower cortex absent.
35. Apothecia infrequent, elongate, marginal or terminal; medulla C–. . . . . PELTIGERA
35. Apothecia usually evident marginal or laminal, round or nearly so; medulla C – or C+ rose.
Apothecia common, in deep surficial pits. . . . . SOLORINA
Apothecia marginal or on isidiate ridges on the lamina, or absent, not in deep surficial pits. . . . . LOBARIA
34. Lower cortex smooth or sparsely to densely rhizinate, but not concealed by a dense tomentum.
36. Lobe surfaces abundantly pruinose; soralia marginal. . . . . PHYSCONIA
36. Lobe surfaces smooth, or if pruinose, then esorediate.
37. Lobes erect or suffruticose, or thallus umbilicate.
38. Thallus umbilicate with imbedded perithecia. . . . . DERMATOCARPON
38. Thallus foliose; perithecia absent.
Thallus abundantly and conspicuously beset with granular pseudocyphellae. . . . . TUCKERMANELLA
Thallus with pseudocyphellae. . . . . TUCKERMANNOPSIS
37. Lobes appressed.
39. Thallus margins and rims of apothecia dissected into isidioid lobules. . . . . ANAPTYCHIA
39. Thallus without isidioid lobules.
40. Medulla C+ red
Thallus without isidia or soredia. . . . . MELANOHALEA
Thallus isidiate, many of the isidia breaking down into soredia. . . . . MELANELIXIA
40. Medulla C–.
41. Rhizines absent; lobes discrete or appearing to flow together, tightly adnate. . . . . HYPERPHYSCIA
41. Rhizines present; lobes discrete, loosely appressed but not tightly adnate.
Thallus light to dark tan, with numerous imbedded black dots (perithecia). . . . . PLACIDIUM
Thallus brownish gray to dark gray; perithecia absent. . . . . PHAEOPHYSCIA
34. Thallus mineral gray, whitish gray, or greenish gray, never umbilicate; cortex K+ yellow or K–.
42. Either the upper cortex with small white pores or the medulla C+ red, or both. . . PUNCTELIA
42. Upper cortex without white pores; medulla C–.
43. Lower cortex white, light tan, or absent.
44. Thallus isidiate, or lower surface fibrous, or both.
Cortex K+ pale yellow. . . . . HETERODERMIA
Cortex K+ deep yellow. . . . . IMSHAUGIA
44 Thallus without isidia, the lower surface corticate.
45. Soredia in marginal soralia; medulla K+ yellow. . . . . HETERODERMIA
45. Soredia absent or laminal, or if marginal, then medulla and cortex K–.
46. Cortex K–. . . . . PHYSCIELLA
46. Cortex K+ yellow.

47. Larger lobes 3 mm or more across; lower cortex tan. . . . . PUNCTELIA
47. Lobes less than 3 mm across; lower cortex white.
Thallus margins long-ciliate. . . . . HETERODERMIA
Thallus margins eciliate. . . . . PHYSCIA

43. Lower cortex brown or black (occasionally pale near the margins).
48. Medulla distinctly tinted orange or salmon. . . . . PYXINE
48. Medulla white or pale yellow.
49. Medulla K–.
50. Thallus sorediate.
Thallus lobes inflated, hollow. . . . . HYPOGYMNIA
Thallus lobes flat, not hollow. . . . . CANOPARMELIA
50. Thallus esorediate; lobes solid.
Medulla KC–; lower cortex with a thick tomentum; lobes appearing inflated. . . . . ANZIA
Medulla KC+ rose; lobes flat, merely rhizinate. . . . HYPOTRACHYNA
49. Medulla K+ yellow or red.
51. Lobes broad, usually 4 mm or more wide, typically with a rhizine-free zone near the margins; medulla K+ red. . . . . PARMOTREMA
51. Lobes narrower; rhizines typically distributed throughout on the lower surface; medulla K+ yellow or red.
52. Upper cortex without white markings; medulla pale but distinctly yellow near the soralia. . . . . MYELOCHROA
52. Upper cortex reticulate or with distinct white markings, at least toward the lobe tips.
Upper cortex reticulate-alveolate; medulla K+ deep yellow, stictic acid. . . . . CRESPOA
Upper cortex, not reticulate-alveolate, with distinct white markings; medulla K+ yellow to red, salazinic acid. . . . . PARMELIA

Group II

Ascomata chronically absent, notably stalked, or the thallus and apothecia black throughout.

1. Ascomata evident.
   2. Apothecia stalked; thallus rudimentary or not evident.
      3. Stalks and exciples not black.
         Thallus bright yellow and leprose; spores subglobose. . . . . CHAENOTHECA
         Thallus neither bright yellow nor leprose; spores various. . . . . SCLEROPHORA
      3. Stalks and exciples black.
         4. Spores septate. . . . . CALICIUM
         4. Spores simple. . . . . MYCOCALICIUM
            Thallus fungicolous on *Trichaptum biforme*. . . . . PHAEOCALICIUM
            Thallus corticolous.. . . . . CHAENOTHECOPSIS
   2. Apothecia not stalked; thallus black throughout.
      5. Thallus well defined, with a distinctly blue green prothallus evident at the margins, or thallus arenicolous.
         Thallus arenicolous. . . . . PLACYNTHIELLA
         Thallus saxicolous. . . . . PLACYNTHIUM
      5. Thallus effuse, granular, without an evident prothallus, never arenicolous.
         6. Paraphyses absent or unbranched; photobiont with a reddish, K+purple sheath. . . . . .
            Apothecia 1-3 per areole. . . . . CRYPTOTHELE
            Apothecia 1 per areole. . . . . PYRENOPSIS
         6. Paraphyses present, branched; photobiont with yellowish, K– sheaths.
            Proper exciple rather evident between the thallus and the hymenium. . . . . PYRENOCARPON
            Proper exciple absent or inconspicuous. . . . . PSOROTICHIA
1. Apothecia chronically absent or rare.
   7. Thallus K+ deep purple.
      8. Thallus lignicolous or corticolous
         Thallus chromate yellow.. . . . . SOLITARIA
         Thallus orange. . . . . CALOPLACA
      8. Thallus saxicolous.
         Thallus margins effigurate; soredia in soralia confined to the ends of the interior lobes. . . . . .
         . . . . . LEPROPLACA
         Thallus not effigurate; soredia in poorly delimited soralia. . . . . FLAVOPLACA
   7. Thallus K– or K+ yellow or red.
      9. Thallus nearly or quite sorediate throughout, or if soredia discrete, then atranorin present.
         10. Thallus bright yellow.
            11. Soredia granular, in delimited, often scattered soralia. . . . . CANDELARIELLA
            11. Soredia fine, diffuse, unorganized into soralia.
               Rhizocarpic acid present. . . . . PSILOLECHIA
               Rhizocarpic acid absent. . . . . CHRYSOTHRIX
         10. Thallus granules without yellowish tints or with faint yellow in *Lepraria vouauxii*.
            12. Prothallus evident at the margin, or the margin with scattered corticate areoles; zeorin present; usnic acid present or absent; atranorin, if present, occasionally the sole secondary metabolite.
            . . . . . LECANORA
            12. Prothallus absent; usnic acid absent, zeorin present or absent; atranorin, if present, not as the sole secondary metabolite.
               Thallus with terpenes only, grayish green. . . . . BOTRYOLEPRARIA
               Thallus with secondary metabolites other than or in addition to terpenes;, variously tinctured

.. . . . . LEPRARIA

9. Thallus not sorediate throughout, or if sorediate then atranorin absent.
    13. Thallus black throughout; photobionts usually blue-green.
        14. Photobiont blue-green or absent.
            Thallus well developed, with a distinctly blue green prothallus evident at the margins. . . . . PLACYNTHIUM
            Thallus effuse, granular, without an evident prothallus. . . . . LICHENOTHELIA
        14. Photobiont green.
            15. Thallus not saxicolous, dark to greenish. . . . . PLACYNTHIELLA
            15. Thallus saxicolous, nigrescent and thread-like
                Hyphal cells in parallel, elongate, longitudinal rows .. . . . . RACODIUM
                Hyphal cells in irregularly disposed, often knobby arrays. . . . . CYSTOCOLEUS
    13. Thallus not black throughout; photobionts green.
        16. Thallus C– and K–.
            17. Thallus without yellowish tints.
                Thallus corticolous. . . . . PLACYNTHIELLA
                Thallus saxicolous.. . . . . FUSCIDEA
            17. Thallus yellow or with yellowish tints.
                Thallus yellow, of notable corticate granules or granular soredia. CANDELARIELLA
                Thallus yellowish green, the soredia in discrete soralia. . . . . LECANIA
        16. Thallus C+ or K+
            18. Thallus UV+ yellow (lichexanthone) or K+ yellow.
                Thallus UV+ yellow; C+ pink.. . . . . OCHROLECHIA
                Thallus UV–, or if so, then also K+ deep yellow; C– . . . . . LOXOSPORA
            18. Thallus UV–, K–.
                19. Thallus esorediate.. . . . . PLACYNTHIELLA
                19. Thallus sorediate.
                    Soredia erupting from verrucae or cortical warts.. . . . . TRAPELIOPSIS
                    Soredia not erupting from verrucae.. . . . . TRAPELIA

GROUP III

ASCOMA A PERITHECIUM, THE SPORES RELEASED THROUGH A SMALL PORE.

1. Thallus saxicolous or terricolous.
   2. Spores abundantly muriform.
      3. Spores 4-8 per ascus. . . . . WILLEYA
      3. Spores 2 per ascus.
         Spores hyaline in the ascus. . . . . ENDOCARPON
         Spores brown in the ascus. . . . . STAUROTHELE
   2. Spores either without septa, or with only transverse septa (rarely somewhat muriform in *Thelidium*).
      4. Spores septate.
         5. Photobiont blue-green. . . . . PYRENOCOLLEMA
         5. Photobionts green.
            6. Thallus on base-rich rock. . . . . THELIDIUM
            6. Thallus on siliceous rock.
               Spores 2-celled, less than 15 μm long. . . . . PLACIDIOPSIS
               Spores more than 2-celled, more than 15 μm . . . . . PSEUDOSAGEDIA
      4. Spores non-septate.
         7. Thallus either squamulose or membranaceous and subgelatinous.
            Thallus squamulose; hamathecium evanescent. . . . . PLACIDIUM
            Thallus membranaceous; hamathecium of persistent, scarcely branched paraphyses. . . . . THROMBIUM
         7. Thallus crustose.
            Perithecia deeply imbedded in the substrate, to 0.3(4) mm across. . . . . BAGLIETTOA
            Thallus thin to thick, evidently epilithic and corticate, sordid to grayish or olive green, or brownish to black. . . . . VERRUCARIA
1. Thallus corticolous or lichenicolous.
   8. Thallus of thick, brown, rounded squamules or thallus lichenicolous
      Thallus lichenicolous in the apothecia of Teloschistaceous lichens. . . . . MUELLERELLA
      Thallus saxicolous. . . . . PLACIDIUM
   8. Thallus not of thick, rounded squamules, never lichenicolous.
      9. Spore walls notably thickened.
         10. Ascomata embedded in a thalloid wart or pseudostroma.
             Ascospores simple. . . . . PERTUSARIA
             Ascospores septate. . . . . TRYPETHELIUM
         10. Ascomata not embedded in a thalloid wart or pseudostroma.
             Spores brown, 3-septate or occasionally 4–7 septate or even imperfectly muriform. . . . . PYRENULA
             Spores 7–9 septate, or colorless and 3-septate. . . . . TRYPETHELIUM
      9. Spores walls not notably thickened.
         11. Spores becoming brown.
             12. Photobiont absent; spores 1-septate.
                 Spores notably constricted at the septum, the cells usually unequal in size. . . . . KIRSCHSTEINIOTHELIA
                 Spores not notably constricted at the septum, the cells subequal in size. . . . . DIDYMOSPHAERIA
             12. Photobiont present; spores septate to muriform.
                 Spores either 1 septate or muriform. . . . . MYCOPORUM
                 Spores neither 1 septate nor muriform. . . . . EOPYRENULA

11. Spores persistently hyaline.
    13. Paraphyses unbranched or absent.
        Perithecia pale or darkening, but not black; paraphyses absent. . . . . PSOROGLAENA
        Perithecia black; paraphyses present. . . . . STRIGULA
    13. Paraphyses loosely to densely branched.
        14. Spores muriform, with both transverse and longitudinal septa.
            Ascomata black, HNO_3–, to 0.3 mm in diameter. . . . . JULELLA
            Ascomata blue green, HNO_3+ reddish, the larger ones more than 0.3 mm across. . . . . MYCOGLAENA
        14. Spores not muriform, with transverse septa only.
            15. Thallus restricted to *Betula* and *Populus*; spores much elongate, nearly or quite as long as the asci. . . . . LEPTORHAPHIS
            15. Thallus of a diversity of corticolous substrates; spores oblong to oval, much shorter than the asci.
                16. Spores up to 20 μm long.
                    Septum of spores eccentric, the cells notably unequal in volume; asci more than 3 times as long as wide. . . . . ANISOMERIDIUM
                    Septum of spores not eccentric, the cells about equal; asci less than three times as long as wide. . . . . NAETROCYMBE
                16. Larger spores more than 20 μm long.
                    17. Spores more than 31 μm long and 12 μm wide, with granular ornamentation. . . . . ACROCORDIA
                    17. Spores less than 31 μm long and 12 μm wide, without granular ornamentation.
                        Spores notably constricted at the septum. . . . CONSTRICTOLUMINA
                        Spores not notably constricted at the septum. . . . . ARTHOPYRENIA

GROUP IV

APOTHECIA IRREGULAR TO ELONGATE, NEVER FLESH-COLORED; THALLUS RUDIMENTARY, OFTEN LITTLE MORE THAN A DISCOLORING OF THE SUBSTRATE AROUND THE APOTHECIA.

1. Spores muriform, with 1–5 longitudinal septa, or simple with parasitic apothecia.
   2. Spores simple and hyaline or brown and muriform.
      Apothecia parasitic on *Letharia*. . . . . PHACOPSIS
      Apothecia corticolous.. . . . . HYSTEROGAPHIUM
   2. Spores septate to muriform.
      Spores more than 27 μm long. . . . . ARTHOTHELIUM
      Spores less than 27 μm long. . . . . ARTHONIA
1. Spores merely septate, with 3–11 transverse septa only.
   3. Spores with lenticular cells, the walls of the septa much thicker near the spore wall; apothecia irregular, often branched or elongating; hymenium IKI–; spores usually IKI+ bluish black.. . . . . GRAPHIS
   3. Spores with cylindrical cells; apothecia more or less circular to oblong, to simply forked; hymenium IKI+; spores IKI+ blue to orange.
      4. Thallus thin to evanescent, smooth; not lichenicolous; spores 3-septate.
         Spores brown, at least in two of the cells. . . . . HYSTERIUM
         Spores colorless.. . . . . ARTHONIA
      4. Thallus thin to obscurely chinky or pulverulent, or lichenicolous; spores 3–15 septate.
         5. Spores less than 5 μm wide, not including the outer hyaline sheath (perispore), if present; thallus lichenicolous or not.. . . . . OPEGRAPHA
         5. Spores more than 5 μm wide; thallus not lichenicolous.
            Spores more than 7-septate, the larger more than 40 μm long.. . . . . ZWACKHIA
            Spores 4–6 septate, less than 40 μm long.. . . . . ALYXORIA

GROUP V

APOTHECIA REGULAR, THE EXCIPLE THALLOID, WITH AN ALGAL COMPONENT, OR THE APOTHECIA K+ PURPLE, OR THE APOTHECIA IMBEDDED IN THALLOID WARTS.

1. Spores non-septate (usually absent in the sorediate warts of some *Lepra* species).
   2. Apothecia immersed in thalloid warts or in heaps of powdery soredia; spores very large.
      Thallus areolate; disks black, pruinose, the ostiole white-bordered and often opening wide. . . . . CIRCINARIA
      Thallus continuous; ascomata not as above, hidden by a dense veil of soredia. . . . . LEPRA
   2. Apothecia adnate or immersed, but not as above; spores of various sizes.
      3. Thallus or apothecia or both yellow.
         4. Spores up to 32 per ascus. . . . . CANDELARIELLA
         4. Spores many more than 32 per ascus.
            Thallus evident; apothecia not globose, open at the surface. . . . . ACAROSPORA
            Thallus absent; apothecia globose, opening by a tiny pore. . . . . THELOCARPON
      3. Neither the thallus nor the apothecia yellow.
         5. Spores numerous, asci always bearing more than 32 spores.
            6. Apothecia small, to 0.5 mm, with greenish pruina. . . . . CAERULEUM
            6. Apothecia often larger, epruinose or with white pruina.
               Mature apothecia opening by a shallow, nipple-like pore. . . . . TRIMMATOTHELOPSIS
               Mature apothecia with the hymenium fully exposed at the surface. . . . . ACAROSPORA
         5. Spores few to 16 per ascus, rarely a few asci with more than 16.
            7. Spore walls thick.
               Thallus saxicolous; medulla C+ red. . . . . VARICELLARIA
               Thallus corticolous; medulla C–. . . . . PERTUSARIA
            7. Spore walls thin.
               8. Apothecia adnate, the disks orange, some of them 2 mm or more across; thallus saxicolous, of scattered to aggregated, smooth, convex areoles. . . . . RHIZOPLACA
               8. Apothecia and thalli various, but not as above.
                  9. Thallus absent or scarcely evident near the apothecium. . . . . MYRIOLECIS
                  9. Thallus thick or thin but generally evident.
                     10. Thallus or apothecia corticolous or muscicolous, or if saxicolous, then with spores less than 14 *µm* long.
                        Spores more than 20 *µm* long. . . . . MEGASPORA
                        Spores less than 20 *µm* long . . . . . LECANORA
                     10. Thallus or apothecia saxicolous and the spores more than 14 *µm* long.
                        11. Apothecial disk distinctly adnate, the surface elevated well above the surface of the thallus. . . . . TRAPELIA
                        11. Apothecial disk flat or concave, the surface at or below the surface of the thallus.
                           Thallus K+ yellow or yellow turning red; spores ellipsoid, rarely more than 15 *µm* wide. . . . . ASPICILIA
                           Thallus K–‘ spores subglobose, mostly more than 15 *µm* wide. . . . . CIRCINARIA
1. Spores septate, muriform, or polaribilocular.
   12. Spores either muriform or with 20 or more transverse septa.
      Spores muriform, with 1–3 longitudinal septa. . . . . DIPLOSCHISTES
      Spores without longitudinal septa. . . . . CONOTREMA

12. Spores 1–3 septate or polaribilocular.
    13. Spores merely septate, or if somewhat polaribilocular, then brown; apothecia and thallus K– or K+ yellow or red.
        14. Spores hyaline.
            15. Apothecia yellow or yellowish or orange.
                Apothecia K– .. CANDELARIELLA
                Apothecia K+ purple. PROTOBLASTENIA
            15. Apothecia black, brown, or whitish pruinose
                Ascus tip staining solid throughout, *Catillaria*-type. HALECANIA
                Ascus tip with the central axial mass not stained blue, *Bacidia*-type . . . . . LECANIA
        14. Spores gray or brown.
            16. Asci disintegrating, not evident with mature spores. CYPHELIUM
            16. Asci evident.
                Spore walls thin and evenly developed, the lumina cylindrical. AMANDINEA
                Spore walls unevenly thickened, the lumina often angled. RINODINA
    13. Spores polaribilocular; spores not brown; apothecia or thallus or both often K+ deep purple.
        17. Apothecia black; thallus white. PYRENODESMIA
        17. Apothecia black or orange; thallus not white or if so then the apothecial disk orange or pale.
            18. Rims of apothecia white, gray, or nigrescent, not yellow or orange, or if so then the thallus effigurate at the margin. CALOPLACA
            18. Rims of apothecia yellow or orange, or apothecia absent; thallus absent, areolate, squamulose, but never effigurate.
                19. Thallus absent or essentially so (rarely with scant yellow, appressed patches); saxicolous; apothecia less than 0.3 mm across; isthmus no more than ⅓ as long as the spore. XANTHOCARPIA
                19. Thallus present, or if absent then the apothecia corticolous and the spore isthmus commonly at least ⅓ the length of the spore.
                    20. Thallus corticolous or lignicolous, immersed, or surficial and K–, or with scattered K+ areoles.
                        21. Thallus white or sordid, more or less continuous. BLASTENIA
                        21. Thallus absent, inconspicuous, or with scattered yellowish areoles
                            Spore isthmus about ⅓ the length of the spore. CALOPLACA
                            Spore isthmus prevailingly at least ⅓ the length of the spore. . . ATHALLIA
                    20. Thallus saxicolous, continuous or discontinuous, or if corticolous, then pale yellow, K+, and continuous.
                        22. Thallus K–. RUFOPLACA
                        22. Thallus yellow or orange, distinctly present at least near many of the apothecia, K+ purple.
                            23. Thallus distinctly orange-tinged, paler than to concolorous with the apothecia SQUAMULEA
                            23. Thallus distinctly yellow, notably paler than the orange or brownish apothecia.
                                24. Apothecia distinctly bicolored, the rims much paler than the disk. GYALOLECHIA
                                24. Apothecia similarly colored throughout.
                                    Thallus more or less squamulose, usually loosely appressed to the substrate; apothecia less than 0.4 mm across. ATHALLIA
                                    Thallus scant to continuous, strongly meshed with the substrate; apothecia commonly more than 0.4 mm across. . . GYALOLECHIA

Group VI

Apothecia regular, the exciple without algae, or exciple absent; apothecia K–.

1. Spores minute and numerous, more than 16 per ascus.
   2. Thallus corticolous.
      Spores simple, more than 32 per ascus. . . . . STRANGOSPORA
      Spores septate, 16–32 per ascus. . . . . AMANDINEA
   2. Thallus saxicolous.
      Disk notably beset with carbonaceous ridges and lumps. . . . . POLYSPORINA
      Disk nearly or quite without carbonaceous intrusions. . . . . SARCOGYNE
1. Spores few to 16 per ascus.
   3. Spores prevailingly non-septate, though sometimes with 2 large polar vacuoles.
      4. Thallus C+ pink, gyrophoric acid present.
         5. Thallus saxicolous. . . . . TRAPELIA
         5. Thallus terricolous or lignicolous.
            Thallus greenish gray or grayish, soredia erupting from verrucae. . . . . TRAPELIOPSIS
            Thallus dark brown or blackish, without verrucae and cortical tissues. . . . . PLACYNTHIELLA
      4. Thallus C–, gyrophoric acid absent.
         6. Thallus granules often more than 0.5 mm across, diffuse, greenish to brown when dry and greener when wet, or thallus terricolous, or both. . . . . PLACYNTHIELLA
         6. Thallus not granular, or granules up to 0.5 mm across, dense, dark brown to black when wet, never terricolous.
            7. Thallus wholly saxicolous.
               8. Larger apothecia more than 0.5 mm across; spores mostly more than 12 μm long.
                  Axis of ascus apex strongly amyloid; apothecial margin black, contrasting with the disk, or if concolorous then stictic acid present. . . . . PORPIDIA
                  Axis of ascus apex not strongly amyloid; apothecial margin and disk concolorous; stictic acid absent. . . . . LECIDELLA
               8. Apothecia nearly all less than 0.5 mm across; spores less than 12 μm long.
                  Apothecia bright yellow. . . . . PSILOLECHIA
                  Apothecia not yellow. . . . . LEIMONIS
            7. Thallus not wholly saxicolous.
               9. Thallus on moss or plant detritus over rock. . . . . BRYOBILIMBIA
               9. Thallus lignicolous or corticolous.
                  10. Apothecia flesh-colored to darkening, usually irregular in shape, with a difficult-to-define margin. . . . . LECANORA
                  10. Apothecia pale to nigrescent, the margin prevailingly round, not particularly irregular.
                     11. Apothecia nearly all less than 0.4 mm across. . . . . PYRRHOSPORA
                     11. Many of the apothecia more than 0.4 mm across
                        Axis of ascus apex strongly amyloid; thallus on the lignin of conifers. . . . . LECIDEA
                        Axis of ascus apex not strongly amyloid; thallus on the lignin or cortex of hardwoods. . . . . LECIDELLA
   3. Spores septate.
      12. Spores brown, or muriform, or both.
         13. Spores muriform, at least in one cell of many spores.
            Thallus brown or grayish; spores mostly more than 17 μm long. . . . . RHIZOCARPON

Thallus white; spores prevailingly less than 17 µm long. . . . . DIPLOTOMMA

13. Spores not muriform.

Thallus absent or very thin; conidia curved-filiform [if from bark in a bog, see also *Buellia schaereri* . . . . . AMANDINEA

Thallus thin to thick, but well developed; conidia short-ellipsoid. . . . . BUELLIA

12. Spores hyaline, never muriform.

14. Paraphyses indistinct or absent.

15. Thallus leprose; apothecia densely pruinose. . . . . CHRYSOTHRIX

15. Thallus not leprose; apothecia nor or only weakly pruinose

Thallus epiphloedeal, dark to olivaceous; apothecia round, convex; spores 1-septate, with one cell larger than the other. . . . . BRYOSTIGMA

Thallus scant or endoploedeal; otherwise without the above combination of characters. . . . . ARTHONIA

14. Paraphyses evident, distinct or intertwined.

16. Spores 2-celled.

17. Paraphyses distinct.

Apothecia dark, the paraphyses nigrescent at the tip. . . . . CATILLARIA

Apothecia pale, flesh-colored, the paraphyses hyaline. . . . . COENOGONIUM

17. Paraphyses intertwined and anastomosed.

18. Spores not polaribilocular, without a central isthmus

Hypothecium hyaline; axial portion of the ascus apex strongly amyloid, notably more so than the tholus. . . . . MICAREA

Hypothecium dark brown; axial portion of the ascus apex concolorous with the tholus in IKI. . . . . MYCOBILIMBIA

18. Spores polaribilocular, with a central isthmus.

Apothecia at least thinly pruinose. . . . . PYRENODESMIA

Apothecia not pruinose. . . . . CALOPLACA

16. Spores 4 to many-celled.

19. Thallus terricolous or muscicolous.

20. Spores acicular, less than 4 μm wide, more than 30 µm long. . . . . BACIDIA

20. Spores fusiform, prevailingly more than 4 μm wide, up to 30 μm long.

Hypothecium hyaline; axial portion of the ascus apex strongly amyloid, notably more so than the tholus. . . . . MICAREA

Hypothecium dark brown; axial portion of the ascus apex concolorous with the tholus in IKI. . . . . BILIMBIA

29. Thallus saxicolous or corticolous.

21. Ascomata with elevated rims and deeply sunken hymenia. . . . . CONOTREMA

21. Ascomata with exposed, surficial hymenia.

22. Spores more than 5 μm wide. . . . . LECANIA

22. Spores to 5 μm wide.

23. Spores more than 35 μm long. . . . . BACIDIA

23. Spores less than 35 μm long.

24. Thallus saxicolous; spores not coiled in the ascus. . . . . BACIDIA

24. Thallus not saxicolous; spores coiled or not in the ascus.

Spores notably coiled in the ascus. . . . . SCOLICIOSPORUM

Spores not coiled in the ascus. . . . . FELLHANERA

ACAROSPORA A. Massal. ACAROSPORACEAE [Photobiont: chlorococcoid. Gr. *akari*, mite + *spora*, seed, evoking the image of the numerous, tiny, mite-like spores. This genus bewilders me; do not presume that the names used below surely apply to your specimen. ~ Thallus crustose to subsquamulose, saxicolous; spores minute, hyaline, numerous, simple.]

1. Thallus yellow or yellow green
   - Medulla C–. . . . . A. CHRYSOPS
   - Medulla C+. . . . . A. TUCKERAE

1. Thallus without yellowish tints.
   2. Substrate HCl+.
      3. Spores fewer than 100 per ascus, more than 7 μm long. . . . . A. MACROSPORA
      3. Spores more than 100 per ascus, less than 7 μm long.
         - Thallus deep brown, without pruina. . . . . A. CANADENSIS
         - At least portions of the thallus white pruinose. . . . . A. STRIGATA
   2. Substrate HCl–.
      4. Gyrophoric or norstictic acids present (most reliably determined through TLC).
         - Cortex K–,C+ pink. . . . . A. FUSCATA
         - Cortex K+ red, C– . . . . . A. SMARAGDULA
      4. Gyrophoric acid absent.
         5. Thallus at least thinly white-pruinose. . . . . A. AMERICANA
         5. Thallus brown, epruinose.
            6. Thallus dark-brown, convex, dispersed areolate; apothecia deeply immersed in a dimple-like opening, one per areole. . . . . A. ELEVATA
            6. Apothecia usually pale brown, neither convex, areolate or rimose; apothecia not immersed in a dimple-like opening, 1 or more per areole.
               - Apothecia mostly more than 0.5 mm across, with a distinctly black margin. . . . . A. BADIOFUSCA
               - Apothecia mostly less than 0.5 mm across, without an black margin. . . . . A. VERONENSIS

Acarospora americana H. Magn. (of America) This species is known locally only from siliceous rocks and weathered lignin locally. The type specimen (Fink, MIN) was collected in 1895 in Kane County. Knudsen et al. (2011) explain why *Acarospora cinereoalba* (Fink) H. Magn., which was described from the same type specimen as *A. americana*, is conspecific with it and why the name *A. americana* has priority. Magnusson (1929) described the habitat of this as "granitic rocks." ~ Spores broadly oblong, 3–5 μm × 1.5–3 μm.

Grundy-MOR, Jefferson-MOR, Kane-ILL,MICH,MIN,NY, Will-MOR

Acarospora badiofusca (Nyl.) Th. Fr. (L. *badius*, chestnut-colored + *fuscus*, brown; from the color of the thallus) Our only record for this species, which is more frequent farther south, is from a granitic boulder at Nachusa Grasslands. ~ Spores ellipsoid, 3–6 μm × 1–2.5 μm.

Ogle-MOR

Acarospora canadensis A. Massal. (after Verona, Italy, wherein resided several Italian lichenologists at the Verona Lyceum) Our only local specimens are from weathered concrete. Armstrong (1977) reported a "brown *Acarospora*" from carbonate rock; if it was an *Acarospora*, it may be referable to this species. *Acarospora fuscata* is brown, but it inhabits non-carbonate rock

and is distinctive in containing gyrophoric acid.

DeKalb-MOR, Kenosha-MOR

Acarospora chrysops (Tuck.) H. Magn. (Gr. *chrysos,* gold + *ops*, eye, face; from the appearance of the thalli as golden eyes) Yet unknown from the Southern Lake Michigan Region, this species is known from as nearby as Jo Daviess County, Illinois, where it was collected from a limestone outcrop in full sun to semi-open prairie. A similar species with more squamulose, uplifted lobe margins, is *A. socialis* H. Magn. (L. *socialis*, the condition of being allied or in association with others), which occurs rarely in the Midwest. ~ Spores broadly ellipsoid, 3.5–4.2 μm × 2.5–2.7 μm. [rhizocarpic acid ± epanorin]

Acarospora elevata H. Magn. (L. *elevatus*, raised up or above; perhaps from the rims of the pore, seemingly elevated above the apothecium) Our only record for this largely western species is from a granitic boulder, just south of the Waukesha County line, north of LaGrange, Wisconsin. Associates included *Acarospora americana, Amandinea punctata, Physcia thomsoniana,* and *Protoparmeliopsis muralis*. ~ Spores narrowly ellipsoid, 4–6 μm × 1.3–3 μm.

Walworth-MOR

Acarospora fuscata (Schrader) Arnold (L. *fuscatus*, brownish; from the color of the thallus) Our only records for this species are from igneous boulders and sandstone outcrops. ~ Cortex C+ pink; spores bacilliform, 4–6 μm × 1.0–1.5 μm. [gyrophoric acid]

Kane-UC,US, Kenosha-MOR, LaSalle-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Waukesha-WIS

Acarospora macrospora (Hepp) Bagl. (Gr. Gr. *makros,* long, large + *spora,* seed; from the relatively few number of spores) This rare species is known locally only from a calcareous hill prairie in McHenry County, where it grows on gravel with *Verrucaria calkinsiana* and *V. nigrescens*, the gravels nested in soils inhabited by *Placidium lachneum, Heppia conchiloba,* and *Psora decipiens.* Local reports of *A. oligospora* (Nyl.) Arnold (Gr. *oligos,* few, small + *spora,* seed; from the relatively few number of spores), a species of siliceous rock and wider spores are referable here. ~ Spores ellipsoid, 8–12 μm × 4–5 μm.

McHenry-MOR

Acarospora smaragdula (Ach.) Uloth (Gr. *smaragdo*, greenish + *-ula*, diminutive; an allusion to the appearance of small greenish gemstones, although the color of the cortex is generally a more brownish cast) Yet unknown locally, this species grows as nearby as Dane County, where it was collected from sandstone, which substrate occurs in our western tier of counties. ~ Cortex K+ red; spores bacilliform, 3–4.5 μm × 1.0–1.5 μm. [norstictic acid]

Acarospora strigata (Nyl.) Jatta (L. *striga*, swath, windrow, bristly; + *-atus*, adjective ending; perhaps from the white pruina evocative of an unshaven face) = *A. cervina* of some local authors. A western species, most of our material is from carbonate rock or weathered concrete. Hyerczyk's (2008) report of *Acarospora glaucocarpa* (Ach.) Körb. is referable here; it has a more dispersed-areolate thallus, the latter commonly obfuscated by irregularly shaped, lecanora-like apothecia. ~ Spores ellipsoid, 3–7 μm × 2.5–4.0 μm.

DeKalb-MOR, DuPage-MOR, Kane-FH, Kenosha-MOR, Lake Il-MOR, Lee-MOR, McHenry-MOR, Will-MOR

Acarospora tuckerae K. Knudsen (in honor of the American botanist, Shirley Cotter Tucker, 1927– , much beloved professor and student of lichens at Louisiana State University) The only

record for this species in the Southern Lake Michigan region is as an associate of *A. americana*, the Fink, 1895, specimen from Kane County. It was taken from what appears to have been a granitic erratic. ~ Cortex UV+ orange; medulla C+ red; spores, ellipsoid, with an evident perispore, 4 μm × 2 μm. [acaranoic acid, gyrophoric acid, rhizocarpic acid, lecanoric acid]

Kane-ILL

Acarospora veronensis A. Massal. (after Verona, Italy, wherein resided several Italian lichenologists at the Verona Lyceum) Our only local specimens are from granitic and basaltic boulders. Many local reports of A. americana are referred here. *Acarospora veronensis* rarely has areoles more than 0.5 mm across and rarely produces pruina; *A. americana* has the larger apothecia more than 0.5 mm across and nearly always produces pruina. ~ Spores ellipsoid, 3.5–5μm × 1–2.1 μm.

DuPage-MOR, Kane-FH,MOR, Kendall-MOR, McHenry-MOR, Noble-MOR, Walworth-MOR

ACAROSPORACEAE

A. Apothecial margins black.
  Disk notably beset with carbonaceous ridges or bumps. . . . . **Polysporina**
  Disk free of carbonaceous intrusions. . . . . **Sarcogyne**
A. Apothecial margins usually not black.
  B. Apothecia with greenish pruina. . . . . **Caeruleum**
  B. Apothecia epruinose or with white pruina.
    Mature apothecia with the hymenium mostly closed to the surface of the thallus, exposed only through a small reddish brown pore; thallus epruinose. . . . . **Trimmatothelopsis**
    Mature apothecia with the hymenium fully exposed at the surface; thallus pruinose or not. **Acarospora**

ACROCORDIA A. Massal. MONOBLASTIACEAE [Photobiont: *Trentepohlia.* Gr. *akrochordon*, a wart; from the relatively large perithecia evocative of warts or blisters. ~ Thallus crustose, endophlodeal; pseudoparaphyses branched and anastomosed; spores large, 8, hyaline with granular ornamentation, 1-septate, broadly fusiform.]

Acrocordia megalospora (Fink) R. C. Harris (Gr. *megas,* large, great + *spora,* seed; from the large spores) = *Arthopyrenia finkii* Zahlbr. According to Harris (1973), this species ranges throughout Illinois and the Southern Lake Michigan region, although the only specimen we can locate is from *Quercus alba* in Kalamazoo County. It evidently prefers elms and white oaks. Wetmore (1988) recognizes Calkins's report of *Arthopyrenia gemmata* as *Acrocordia gemmata* (Ach.) A. Massal., which Calkins reported from "oaks and hickories at River Forest and in all our territory." Another Calkins specimen at NY, however, named *Acrocordia gemmata,* is a non-lichenized pyrenomycete with muriform spores. ~ Spores usually 50 μm × 20 μm.

Kalamazoo-MSC

AGONIMIA Zahlbr. VERRUCARIACEAE [Photobiont: *Chlorococcoid.* Perhaps from an Urdu name or place. ~ Thallus squamulose, granular; perithecia not seen locally; spores 2–8, muriform, brownish in age.]

Agonimia opuntiella (Buschardt & Poelt) A. Vězda (L. *Opuntia* + *-ella*; from its appearance as a tiny *Opuntia* cactus) Our only record for this species is from a sandy soil over dolomite at the Flora Prairie. This lichen, with its tiny, brown, bud-like scales evocative of an *Opuntia* with its cortical hairs is quite distinctive; commonly at the bases of trees with the pleurocarpous moss, *Anomodon*. ~ Spores 2 per ascus, 60–70 μm × 25–28 μm.

Boone-MOR

ALYXORIA Ach. LECANOGRAPHACEAE [Photobiont: *Trentepohlia.* Gr. *alyxos,* an eye disfigurement + *-oria*, evocative of or belonging to; perhaps from the nigrescent eye-like apothecium. Thalli crustose; apothecia lirellate, disk exposed, often pruinose; spores mostly 8, hyaline to brown, mostly 4–6 septate.]

Alyxoria varia (Pers.) Ertz & Tehler (L. *varius*, different; probably from the variability in the openness of the apothecia) = *Opegrapha varia* Pers., *O. pulicaris* (Hoffm.) Schrad. Calkins reported it simply from "various trees." Our only modern records are from *Acer saccharum, Populus* spp., *Quercus alba, Quercus macrocarpa, Quercus rubra,* and punky lignin from a fallen branch. ~ Spores 19–32 μm × 5–7 μm.

Cook-F,MOR,NY, DuPage-MOR, LaSalle-MOR, Lee-MOR, Milwaukee-MOR, Rock-MOR, Will, Winnebago-MOR

AMANDINEA Scheid. & H. Mayrh. CALICIACEAE [Photobiont: *Trebouxia*. In honor of one A. Maniere, evidently known to Maurice Gustave Benoit Choisy, "*Dedie a Madame A. Maniere (1937) en gage d'amitie*." Her name, we assume, was Amandine, a diminutive of Amanda. ~ Thallus crustose, dark to endophloedeal, without secondary metabolites; spores 8–32, brown, 1-septate, the walls not notably thickened; conidia acicular to filiform.]

1. Asci 16+ spored. . . . . A. POLYSPORA
1. Asci 4–8 spored.

   Spores constricted at the septum, the walls not ornamented; at least the young ascomata with a gray lecanorine rim.. . . . . A. DAKOTENSIS

   Spores not constricted at the septum, the walls at least weakly ornamented; ascomata with a lecideine rim colored like the disk.. . . . . A. PUNCTATA

Amandinea dakotensis (H. Magn.) P. May & Sheard (after the state of North Dakota) Common southward, this lichen is relatively frequent locally. We have specimens from the branches and branchlets of *Acer rubrum, Acer saccharum, Betula papyrifera, Malus* spp. *Quercus alba, Quercus macrocarpa, Pinus strobus, Prunus serotina, Pyrus calleryana, Rhamnus cathartica, Rhus typhina, Tilia americana*, and *Tilia cordata*. Associates include *Amandinea punctata, Chrysothrix caesia, Phaeophyscia ciliata, Physcia millegrana,* and *Physcia stellaris* There is a Calkins specimen (#167, NY) of this species from Cook County, which he called *B. alboatra*. ~ Epithecium brown, the paraphyses darkened at the tips; spores 9–15 μm × 5.5–7.5 μm.

Allegan-MOR, Benton-MOR, Berrien-MOR, Cass-MOR, Cook-MOR,NY, DuPage-MOR, Elkhart-MOR, Ford-MOR,

Iroquois-MOR, Jasper-MOR, Kenosha-MOR, Kent-MOR, Kosciusko-MOR, Lake-IN -MOR, Lee-MOR, McHenry-MOR, Ottawa-MSC, Steuben-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Amandinea polyspora (Willey) E. Lay & P. May (Gr. *poly*, many + *spora*, seed; from the many-spored asci) Frequent to common just to the west and south of the Southern Lake Michigan region, where it grows on twigs and branches of open-grown trees. Infrequent with us, our specimens are from *Alnus glutinosa, Carya cordiformis, Malus pumila* and *Prunus serotina*. Associates include *Amandinea punctata, Arthonia caesia*, and *Physcia millegrana*. ~ Spores 8.5–13 μm × 4.0–5.5 μm.

Allegan-MSC, Cook-F,MOR, DeKalb-MOR, DuPage-MOR, Walworth-WIS, Winnebago-MOR

Amandinea punctata (Hoffm.) Coppins & Scheid. (L. *punctatus*, bespeckled, dotted; perhaps from the appearance of numerous tiny black apothecia) *Amandinea punctata* is characteristic of weathered lignin, where it often grows with *Arthonia caesia, Caloplaca microphyllina, Candelaria concolor, Physcia adscendens*, and *Physcia millegrana*. There are also specimens from *Acer negundo, Acer saccharinum, Juniperus horizontalis, Quercus macrocarpa, Quercus rubra, Salix fragilis*, and *Ulmus americana*. It occurs rarely on siliceous rock. *Buellia schaereri* and *B. parasema* (in part) of Calkins, who reported it from Cook and Grundy counties, noting that it grew on weathered rails and once on an old stump. He does not mention *Buellia punctata*. The fact that Imshaug (1951) cited specimens from Cook and Grundy counties suggests strongly that Calkins's reports are referable here. See also the notes under *Buellia schaereri*. ~ As we understand it, the thallus is quite variable, from scant to consisting of grayish, often aggregated areoles or even verrucae; spores 11–18 μm × 4–8 μm.

Allegan-MOR, Calhoun-MICH, Cass-MOR, Cook-MOR,NY, DeKalb-MOR, DuPage-MOR, Ford-MOR, Grundy-F,MOR,WIS, Jefferson-WIS, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-NY, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Porter-INDU,MIN, Rock-WIS, Starke-MOR, Waukesha-MOR, White-MOR, Will-MOR.

ANAPTYCHIA Körb. PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *ana-* throughout + *ptychia*, fold or layer; probably from the interwoven hyphae of the algal and medullary layers of the upper cortex. ~ Thallus foliose, narrowly lobed and lobulate, pale beneath with a poorly developed cortex; apothecial rim usually crenulate; spores 8, brown, 1-septate.]

Anaptychia palmulata (Michx.) Vain. (L. *palma*, the palm of the hand + *-ulatus*, diminutive adjective ending; from the small finger-like lobules) Includes Thomson's (1963) report of *Physcia pulverulenta* (Schreb.) Hampe from Wauconda [1908, Wright (BSAL)]. Hale (1979) restricts *P. pulverulenta* [now known as *Physconia distorta* (With.) J. R. Laundon] to the western United States. He refers all the eastern material to *Anaptychia* "*palmatula*" (Michx.) Vain. Thomson referred the Lake County, Illinois, specimen to the forma *pulverulenta*, and the St. Joseph County, Indiana, specimen to the forma *venusta* (Ach.) Sandst. The St. Joseph County, Indiana, specimen is from the base of a hardwood in a swamp. Some early reports of this species are referable to *Physconia leucoleiptes*, which see, so it is possible or even probable that these reports are referable to *A.*

palmulata as well. In southern Illinois and Missouri, where this species is occasional, it grows on shaded sandstone and at the bases of old-growth trees in natural areas. ~ Spores brown, thin-walled, or septum somewhat thickened. [zeorin]

Lake IL-BSAL, St. Joseph IN-MICH, Waukesha-WIS

ANISOMERIDIUM (Müll. Arg.) M. Choisy MONOBLASTIACEAE [Photobiont: *Trentepohlia* and/or Chlorococcoid. Gr. *an-*, not, + *isos*, equal + *meridos*, part or portion, from the unequal cells in some species. ~ Thallus usually corticolous and endophloedeal; pseudoparaphyses branched and interwoven; asci long-cylindric; spores usually 8, hyaline, 1–3 septate. According to Harris (1990), this is the oldest name for this genus; pycnidia often short-beaked.]

1. Asci ovate to obovate; spores about 3 times as long as wide, sometimes becoming 4-celled; microconidia elliptical . . . . . A. POLYPORI
1. Asci slenderly cylindric to clavate; spores about twice as long as wide, remaining 2-celled; microconidia globose.
   Spores to 5 μm wide, some usually bent. . . . . A. LEUCOCHLORUM
   Spores mostly more than 5 μm wide, symmetrical. . . . . A.. BIFORME

Anisomeridium biforme (Borrer) R. C. Harris (L. *biformis*, of two forms; from the two unequal cells of the spores) = *Arthopyrenia gemmata* of North American authors, not (Ach.) A. Massal., but see also *Eopyrenula intermedia* and *Acrocordia megalospora; Ditremis biformis* (Borrer) R. C. Harris. Infrequent, our only specimens are from the bark of *Populus deltoides, Quercus alba, Quercus* rubra, and *Tilia americana*. Harris (1973) says that this species is rare in the Great Lakes region. ~ Asci 65–130 μm × 10–15 μm; spores, nearly uniseriate in the ascus, 10–17 μm × 5–8 μm.

Cook-FH,MICH,MIN,NY,WIS, DuPage-MOR, McHenry-MOR, Porter-INDU,MIN,US

Anisomeridium leucochlorum (Müll. Arg) R. C. Harris (Gr. *leukos*, white + *chloros*, green, greenish yellow; probably an allusion to the color of the thallus) This species is known from as nearby as McLean County, Illinois, where it was collected on *Juglans nigra* at Funk's Grove. ~ Asci cylindric-obovate 53–72 μm × 12–17 μm; spores irregularly arranged in the ascus, 12–18 μm × 4–7.5 μm. Harris (1973) wonders about the distinctness of this species from *A. biforme*.

Anisomeridium polypori (Ell. & Everh.) M. E. Barr (Gr. *poly*, many + *poros,* pore, passage, way; the allusion unclear) = *Arthopyrenia willeyana* R. C. Harris; *Anisomeridium willeyanum* R. C. Harris) R. C. Harris; *A. juistense* (Erichs.) R. C. Harris; *A. nyssaegenum* (Ell. & Ev.) R. C. Harris, *Ditremis nyssaegenum* (Ell. & Ev.) R. C. Harris. Very common on the bark of *Crataegus* spp., *Juglans nigra, Quercus alba, Q. macrocarpa, Populus deltoides, Tilia americana,* and *Ulmus americana*. There are several Cook County records from *Crataegus* that represent, according to Richard Harris (pers. comm.), the conidial state of this lichen. The macroconidia are held together by a colorless mucilage in packets that resemble polysporous asci filled with 1-septate spores. This has been called *Sarcinulella banksiae* Sutton & Alcorn, an anamorphic form known from Australia. Spores 1–3 septate, 15–20 μm × 4–5 μm.

Barry-MIN,MSC, Berrien-MSC, Cass-MSC, Cook-F,MOR,NY, DeKalb-MOR, DuPage-MOR, Ford-MOR, Kalamazoo-F,MSC, Kane-MOR, Kankakee-MOR, Kenosha-MOR,WIS, Lake In-MOR, LaSalle-MOR, Livingston-MOR,

McHenry-MOR, Rock-WIS, Will-MOR, Winnebago-MOR

ANZIA Stizenb. PARMELIACEAE [Photobiont: *Trebouxia.* In honor of Martino Anzi, 1812–1883, an Italian cryptogamist. ~ Thallus foliose,thick-lobed, the lower surface black-tomentose; spores numerous, minute, curved, hyaline, simple.]

Anzia colpodes (Ach.) Stizenb. (Gr. *kolpos*, bosom, breast, womb + *-ode*, like, resembling; only Acharius knows for sure, but the small, sessile, brown apothecia may have reminded him of nipples) = *Parmelia colpodes* of Calkins (1896), who reported it from "oaks near Lemont and there is a specimen at CASC from LaSalle County [Calkins #6011] from "various trees." In the Missouri Ozarks, this species is usually found on *Quercus velutina* in natural areas. ~ Upper cortex K+ yellow; medulla UV+ white. [atranorin, divaricatic acid]

Branch-CAS, Cook, LaSalle-CASC

ARTHONIA Ach. ARTHONIACEAE [Photobiont: *Trentepohlia* or Chlorococcoid, or absent. Perhaps from Gr. *arthron*, a joint + *onos*, diminutive; after the tiny, irregularly rayed, jointed-looking apothecia of some species. The species names presented here must be regarded as provisional placeholders until the genus is much better understood in North America. An even less than casual glance at the treatment in Harris & Ladd (2005) is enough to humble anyone who pretends authority here; the user must regard all of the names presented here as provisional. ~ Thallus crustose, endophloedeal; apothecia immersed or superficial, flat or opening by a slit; interthecial hyphae indestinct; asci subglobose; spores 8, hyaline or brownish, 1–7 septate, often clavate. In older specimens the red chromophores are often blanched in cell of *Trentepohlia*, but they remain generally irregular in shape, with many of the longer dimensions more than 15 μm across; the cells of Chlorococcoid algae are circular in shape and rarely exceed 15 μm in diameter]

1. Ascocarps with distinct tinctures of red; ascospores 4–7 septate. . . . . A. CINNABARINA
1. Ascocarps brown to nigrescent, often with fewer than 4 septa.
   2. Spores muriform. . . . . A. SUSA
   2. Spores not muriform.
      3. Ascomata with thick, carbonized walls, opening by a narrow slit. . . . . A. ATRA
      3. Ascomata without thickened wall, not opening by a narrow slit.
         4. Many apothecia notably irregular, elongated to branched.
            Spores less than 3× as long as wide, becoming brown in the ascus; apothecia reddish brown to nigrescent; thallus white. . . . . A. PYRRHULIZA
            Spores more than 3× as long as wide, remaining hyaline in the ascus; apothecia dark brown to black; thallus whitish to sordid or greenish gray. . . . . A. RADIATA
         4. Apothecia round or nearly so.
            5. Spores 1–septate.
               Photobiont absent; spores mores more than 15 μm long.. . . . . A. "UNISEPTATA"
               Photobiont present; spores less than 15 μm.. . . . . A. DISPERSA

5. Spores 2-5 septate.
   6. Thallus pale or yellowish, forming a distinctive patch; spores mostly 2–septate; photobiont *Trentepohlia*. . . . . A. DIFFUSA
   6. Thallus obscure to silvery-gray; spores 3–5 septate, but usually undeveloped; photobiont present or absent.
      Spores 3-septate. . . . . A. PUNCTIFORMIS
      Spores 5-septate. . . . . A. QUINTARIA

Arthonia atra (Pers.) A. Schneider (L. *atra*, black; from the color of the apothecia) = *Opegrapha atra* Pers. Infrequent, we have a specimen from *Quercus macrocarpa* and another from a fallen branch in upland woods. Many specimens cited from Illinois are based upon misidentifications of the non-lichenized *Hysterium pulicare* or *Hysterium angustatum*; the spores of these *Hysterium* species are usually wider than 5 μm and with at least two cells pale brown, at least outside the ascus. ~ Photobiont *Trentepohlia*. Asci short-cylindric -clavate, 39–47 μm × 15 μm, the spores 3-4 septate, hyaline, 17–25 μm × 3.7–5.0 μm.

Calhoun-MOR, Jasper-MOR

Arthonia cinnabarina (DC.) Wallr. (L. *cinnabarina*, vermillion, from the color of the ascocarp) = *A. gregaria* (Weigel) Körb. ; *A. tumidula* (Ach.) Ach. There is a Calkins specimen (F) from "Illinois" that, presumably, is the Southern Lake Michigan region. It is similar to *A. pyrrhuliza* and *A. radiata*, but the apothecia are notably pruinose and dark reddish brown; the spores are 4-5 celled and about 12 μm long. There are two Hall specimens (F) from downstate that are similar, though the older spores are tinted gray or brown. One (Hall *s.n.*, MOR) from Menard County, resembles most closely what Harris & Ladd (2005) call *Arthonia* sp. #17128; the ascomata are dendritic, dark red when wet, heavily pruinose.

Arthonia diffusa Nyl. (L. *diffusus*, spread out, extensive; for reasons known only to Nylander) There is a Calkins specimen (#307) from "Illinois," presumably from in or near the Southern Lake Michigan region, which has 2–4 celled spores 15–22 μm long × 6–10 μm wide, distinct paraphyses, round black apothecia that are somewhat pruinose, and a rather thick thallus. It has been annotated as *A. polymorpha* Ach. Until disabused of the idea, we are including here the report (Thomson 2003) of *A. willeyi* Tuck from Rock County.

Rock

Arthonia dispersa (Schrad.) Nyl. (L. *dispersus*, scattered; perhaps for its general distribution) Yet unknown from our region, we have specimens of this species from as nearby as Champaign County, Illinois. This is the name we are applying to those species with 2-celled spores with little of no constriction at the septum, usually with a Trentepohlioid photobiont, sometimes non-lichenized, and IKI– ascal tissues. ~ Spores 9–13 μm × 3.4–4 μm, one end slight wider than the other.

Arthonia muscigena Th. Fr. ()

Arthonia punctiformis Ach. (L. *punctus*, dotted + *forma*, the shape of; probably from the minutely dotted, slightly bleached, appearance of the apothecia on the twig) This is the name we are using for those non-lichenized fungi with 3-septate spores, minute apothecia scattered in the surface cortex of scarcely bleached twigs. It rare produces ascospores, so we cannot be certain

that sterile material is not the more southern, *Arthonia quintaria*, which see. Our specimens are probably not *A. punctiformis*, but until the non-lichenized species with roundish apothecia, and 3-5 septate spores is revised, we are left with little choice. Whatever its name, it is frequent on the smooth bark of twigs, branches, and young boles. We have fertile specimens at MOR from as nearby as Peoria; see also the discussion under *A. quintaria*.

Kenosha-WIS

Arthonia pyrrhuliza Nyl. (Gr. *pyrrhos*, purplish + L. *-iza*, finch; perhaps the dark red apothecia reminded Nylander of the color of the purple finch) Calkins described his specimen as "*Thallus white, thin; apothecia reddish, slender, much divided, ramose.*" Calkins noted that it was rare on oaks in Will County, but Fink (1935) doubts Illinois reports. There is a specimen from Menard County (F: 1073785). The apothecia are sessile upon the substrate, with much-branched, irregularly fissured units. ~ Photobiont *Trentepohlia*. Spores 13.5–15.5 μm × 4.0–6.0 μm, with equal cells, becoming brown in the ascus.

Will

Arthonia quintaria Nyl. (L. *quintaria,* of or relating to five, evoking the 5-septate spores) Frequently there are specimens with silver-gray thalli, globose but sterile asci, and without a photobiont, but we have yet to find a fertile specimen that can support the unquestioned presence of this species in the region. There is a Calkins specimen of this species at the Field Museum from "Illinois, on oaks"; presumably this is from the Southern Lake Michigan region. In his book he listed hickories and maples as the substrates. There is a recent record for Champaign County, Illinois (Ladd #23767, NY). See also the notes under *A. pyrrhuliza*.

Arthonia radiata (Pers.) Ach. (L. *radiatus*, rayed; from the branched apothecia) The Walworth and Winnebago county specimens were collected on *Tilia americana*, the Berrien on *Quercus rubra.* The Kendall and Racine county specimens were from *Carya ovata* and the DuPage County specimen was collection on open-grown *Gleditsia triacanthos*. Calkins reported having found it "on oaks near Elgin and elsewhere." All of the specimens we are including here (that we have seen) have oblong-clavate to clavate-cylindric asci and oblong, equal-celled spores 14–16 μm × 2.9–4.5 μm. ~ Photobiont *Trentepohlia*.

Allegan-MSC, Berrien-MIN, Cook-F, Kendall-MOR, Walworth-MOR, Winnebago-MOR,WIS

Arthonia susa R. Harris & Lendemer (L. designation of the region of the type locality, the Southeastern United States [of] America) = *Arthonia taediosa* of Calkins, who reported it from "maples in the Des Plaines valley; also found on oaks." ~ Photobiont Chlorococcoid, the cells mostly 8–15 μm. ~ Apothecia rare longer or broader than 0.6 mm, the hymenium standing a bit above the surface of the substrate; spores mostly 7 septate, each cell 1-3 muriform, 24–33 μm × 12–15 μm. Compare with *Arthothelium spectabile*.

Cook-F

Arthonia "uniseptata" (L. *una*, one + *septata*, walled) This evidently undescribed species is rather frequent on the smooth bark of branches of several trees and shrubs, including *Acer saccharinum, Acer saccharum, Prunus serotina, Quercus rubra, Quercus velutina*, and *Rhus glabra*. It is consistently non-lichenized, with globose asci and 1-septate oval spores (15–28 μm × 8–14 μm) with equal cells. One might be inclined to separate forms with spores mostly more than 18 μm

from those with shorter spores.

Berrien-MIN, DuPage-MOR, Kenosha-MOR, Kosciusko-MOR, Lake IN-MOR, Lake-IN -MOR, Porter-MOR, Will-MOR

ARTHONIACEAE

A. Ascoma circular to misshapen, but with the epithecium continuous; spores muriform. . . . . **Arthothelium**

A. Ascoma indistinctly shaped, with portions of the epithecium incompletely exposed at the surface; spores septate to muriform.

Thallus epiphloedeal, dark to olivaceous; apothecia round, convex; spores 1-septate, with one cell larger than the other. . . . . **Bryostigma**

Thallus scant or endoploedeal; otherwise without the above combination of characters. . . . . **Arthonia**

ARTHOPYRENIA A. Massal. ARTHOPYRENIACEAE [Photobiont: *Trentepohlia* or absent. Perhaps from Gr. *arthron,* a joint + *pyren,* kernel; presumably after the kernel-like perithecia, in a lichen that otherwise resembles a thallus of *Arthonia*. ~ Thallus immersed; spores typically 8, hyaline, 1-septate, not particularly constricted at the septum.]

Arthopyrenia analepta (Ach.) Massal. (Gr. *ana*, up, against, back + *lepta*, small or narrow, especially with regard to coins of low value or size; perhaps the tiny perithecia evoked relatively small coins, compared, say, to some *Pyrenulae*) Not yet know from the Southern Lake Michigan region, this species is known from nearby Grant County, Wisconsin, where it grows on white-bark birches. ~ Spores 16–20 μm × 6–7 μm.

ARTHOPYRENIACEAE

1. Spores less than 24 μm long and 7.6 μm wide; asci prevailingly less than 100 μm long. . . . . **Arthopyrenia**

1. Spores mostly more than 24 μm long and 7.6 μm wide; asci mostly more than 100 μm long. . . **Constrictolumina**

ARTHOTHELIUM A. Massal. ARTHONIACEAE [Photobiont: *Trentepohlia*. Perhaps from Gr. *arthron*, a joint + *thele*, nipple; after the apothecia, which superficially resemble pyrenocarps, but are actually like those of *Arthonia. Arthothelium* is no better known. Spores 8, hyaline or brownish, muriform.]

1. Spores 2–5 septate longitudinally, mostly more than 26 μm long. . . . . A. SPECTABILE

1. Spores 1-2 septate longitudinally, to 26 μm long

. Spores more than 21 μm long. . . . . A. RUANUM

Spores less than 21 μm long. . . . . A. "SUBHALLI"I

Arthothelium ruanum (A. Massal.) Körb. (After Mount. Rua near Toreglia in the Euganean Hills of Italy, the summit from which the type was collected μm) The only record we have seen locally is from Rhus typhina at Springbrook Prairie Forest Preserve, DuPage County. Fink (1935), does not treat this species, but presents *Arthothelium hallii* (Tuck.) Zahlbr. (after Elihu Hall, 1822–1882, American botanist from Athens, Illinois, and one of the organizers of the Illinois Natural History Society at Bloomington) which he describes as having an obvious nigrescent

prothallus, which our specimens to not display except to scant degree. He also gives the spore size as 20–32 μm × 7-10. If care isn't taken to note the photobiont, one might confuse this species with *Arthonia susa*, which see, with spores mostly more than 27 μm long. ~ Epithecium nigrescent, persistent and adherent to the distal end of the obpyriform to clavate asci; spores 22–26 μm × 7–8 μm.

DuPage-MOR

Arthothelium spectabile (Flotow) A. Massal. (L. *spectabilis*, remarkable, visible; probably from the fact that its apothecia are much larger than those of its relatives) = *Arthonia spectabilis* of Calkins (1896), who noted that it grew on "maples at Glencoe, Riverside and elsewhere." The Berrien County record is from *Acer saccharum* at Warren Woods State Park. ~ Apothecia flat and flush with the substrate, mostly 0.6–1.5 mm in diameter or long; spores 33–45 μm × 15–23 μm. Compare with *Arthonia susa*.

Berrien-MSC, Cook-F,MOR,NY

Arthothelium "subhallii" (Evocative of A. hallii) Our only record for this species is from the smooth bark of *Prunus serotina*. If the absence of a photobiont is overlooked, it would resemble *A. hallii*, but with smaller spores, some of which have only one cell with a longitudinal septum while others are merely five septate. It might belong to the genus *Arthonia*, but given the placement of *A. susa* in *Arthonia*, I still have no firm idea as to how *Arthonia* and *Arthothelium* are distinct as genera. It does not have the adherent epithecium persistent on the apices of the asci. A specimen from *Acer saccharum* in Effingham County, Illinois, was annotated *A. hallii* in 1993. ~ Spores 17– 20 μm × 6–8 μm.

DuPage-MOR

ASPICILIA A. Massal. MEGASPORACEAE [Photobiont: *Trebouxia*. L. *aspicilia*, "eyes of the viper"; probably from the round, lidless "eyes" or apothecia. ~ Thallus saxicolous; apothecia immersed, the paraphyses filiform; spores 2–8, hyaline, simple, large, ovoid.]

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1. Thallus K+ yellow turning red, norstictic acid.. . . . . A. CINEREA
1. Thallus K+ persistent yellow, stictic acid
   Thallus thin, smooth, continuous to rimose. . . . . A. LAEVATA
   Thallus thick, verrucose to subareolate. . . . . A. VERRUCIGERA

Aspicilia cinerea (L.) Körb. (L. *cinereus*, ash-colored; from the color of the thallus) This species occurs frequently on granitic boulders in our western sector. ~ Thallus K+ red; spores 11–21 μm × 7–12 μm. [norstictic acid, ± atranorin]

DuPage-MOR, Grundy-MOR, Jefferson-MOR, Lee-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Aspicilia laevata (Ach.) Arnold (L. *laevis*, smooth + *-atus*, provided with; from the smooth upper surface of the thallus) Our only records for this species are from granite boulders in an open woods. ~ Thallus K+ deep yellow; spores 13– 23 μm × 9–13 μm. [stictic acid, ± norstictic acid, ± some triterpenoid]

LaSalle-MOR, McHenry-MOR

Aspicilia verrucigera Hue (L. verruca, wart + *gero*, to carry, bear) Rare, our only record is from a sandstone exposure on an open cliff overlooking Franklin Creek. ~ Thallus + deep yellow; spores 16– 19 μm × 10–13 μm. [stictic acid, fatty acids around 6-7 in solvent C]

Lee-MOR

ATHALLIA Arup, Frödén, & Søchting TELOSCHISTACEAE [Photobiont: mostly *"Pseudotrebouxia."* Gr. *a-*, without + *thallos*, green shoot, or originally the vegetative portion of a plant. ~ Thallus crustose, mostly endophloedeal; spores 8, hyaline, polaribilocular, the isthmus more than ⅓ the length of the spore. Anthraquinones, particularly parietin.]

1. Thallus saxicolous. . . . . A. VITELLINULA
1. Thallus corticolous or lignicolous.
   Apothecia orange, the rims often with an outer ring suggestive of thallus. . . . . A. PYRACEA
   Apothecia yellow, the rims simple, nearly or quite concolorous with the disk. . . . . A. HOLOCARPA

Athallia holocarpa (Hoffm.) Arup, Frödén, & Søchting (Gr. *holos*, whole, all + *karpos*, fruit; possibly from scant or often absent thallus) = *Caloplaca holocarpa* (Hoffm.) Wade. Our only records for this species, as we understand it, are from *Populus* and weathered wood. ~ Apothecia usually 0.3–06 mm across; spores 10–16 μm × 5–8 μm, the septum 3–6 μm.

Allegan-MSC, DuPage-MOR, Ford-MOR, Livingston-MOR

Athallia pyracea (Ach.) Arup, Frödén, & Søchting (Gr. *pyr-*, fiery + *-aceus*, having a resemblance to, from the fiery orange apothecia. = *Caloplaca pyracea* (Ach.) Zwackh. Frequent on the bark of *Populus* and on lignin, sometimes with *A. holocarpa*. There are also local specimens on the bark of *Quercus velutina*, a young *Fraxinus lanceolata*, and even *Pinus resinosa*. ~ Apothecia 0.5–1 mm across; spores 10–14 μm × 5.5–7 μm, the septum 1.5–4 μm.

Berrien-MOR, Cook-MOR, DuPage-MOR, Grundy-MOR, Jefferson-WIS, Kane-MOR, Kenosha-MOR, Kosciusko-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR, Livingston-MOR, McHenry-MOR, Noble-MOR, Porter-MOR, Racine-MOR, Steuben-MOR, White-MOR, Will-MOR, Winnebago-MOR

Athallia vitellinula (Nyl.) Arup, Frödén, & Søchting (L. *vitellus*, egg yolk + *-inus*, pertaining to, *-ulus*, diminutive.) = *Caloplaca vitellinula* (Nyl.) H. Olivier. We have one record from a granitic boulder; all others are from limestone or concrete. ~ Spores 18–15 μm × 4.5–7.5 μm.

Boone-MOR, DuPage-MOR, Kane-MOR, LaSalle-MOR, Lee-MOR, Ogle-MOR, Walworth-MOR, Waukesha-MOR, Winnebago-MOR

BACIDIA De Not. RAMALINACEAE [Photobiont: green. L. *bacidium,* little rod; from the elongate spores. We are including here species that have been placed in the Genus *Bacidina* Vězda, which differs from *Bacidia* in having a paraplectenchymatous exciple and a rounded axial mass in the ascus tip, rather than conic as is seen in *Bacidia*. ~ Thallus crustose; apothecia without a thalline margin; spores narrowly elliptic to acicular, 8, hyaline, 3–several septate, needle-like; tholus uniformly weakly amyloid, *Bacidia*-type; conidia filiform, curved.]

1. Thallus terricolous or muscicolous. . . . . B. BAGLIETTOANA
1. Thallus saxicolous or corticolous.
   2. Apothecia jet black.
      3. Thallus corticolous.
         Spores acicular. . . . . B. SCHWEINITZII
         Spores bacilliform to clavate. . . . . B. CIRCUMSPECTA
      3. Thallus saxicolous.
         Spores fusiform. . . . . B. GRANOSA
         Spores acicular. . . . . B. EGENULA
   2. Apothecia pale, reddish, or pruinose.
      4. Apothecia pruinose throughout. . . . . B. SUFFUSA
      4. Apothecia epruinose or with pruina only marginal.
         5. Apothecia pale to flesh-colored or brown; hypothecium colorless or pale brownish, K–.
            Spores less than 2 μm wide; hypothecium hyaline; apothecia usually flesh-colored. . . . . B. DELICATA
            Spores more than 2 μm wide; hypothecium usually with tinctures of brown; apothecia usually yellow-brown. . . . . B. RUBELLA
         5. Apothecia darker, hypothecium yellowish to brown, K+ reddish under the compound microscope.
            Thallus distinctly granular. . . . . B. DIFFRACTA
            Thallus smooth. . . . . B. POLYCHROA

Bacidia bagliettoana (A. Massal. & De Not.) Jatta (after Francesco Baglietto, 1826–1916, Italian physician and lichenologist) = *Bacidia muscorum* (Sw.) Mudd. Muscicolous or terricolous; infrequent, one record is from thin soil over dolomite with *Placidium squamulosum*; another is from landscape fabric over soil. The Kane County specimen was reported by Fink (1906). ~ Spores acicular, 25–55 μm × 1.5–2 μm.

DuPage-MOR, Kane, Will-MOR

Bacidia circumspecta (Vainio) Malme (L. *circum*, near, around + *specto*, seen or noted, perhaps noted in the neighborhood) Infrequent, our records are from *Populus tremuloides* and *Ulmus americana*. ~ Spores bacilliform to clavate 3-9 septate, 11–45 μm × 1.6–3.3 μm.

Lake Il-MOR, McHenry-MOR

Bacidia delicata (Leight.) Coppins (L. *delicatus*, dainty) = *Bacidina delicata* (Leight.) V. Wirth & Vězda Our only record is from the base of *Quercus alba*. We are using this name provisionally to apply to *Bacidiae* with acicular spores, colorless apothecial tissues, and pycnidia with filiform conidia. ~ Spores acicular, 3–7 septate, 31–45 μm × 1.3–1.8 μm.

Kane-MOR

Bacidia diffracta S. Ekman (L. *dis*, apart + *frangere*, to break; to break apart, such as light as it passes the edges of various opaque areas) Yet unknown from the region it has been collected in nearby Piatt County on an old-growth *Quercus rubra*, though it characteristically grows on Carya ovata and Juniperus virginiana. ~ Spores acicular, 3–11 septate, 32–69 μm × 2–4 μm.

Bacidia egenula (Nyl.) Arnold (L. *egenus*, needy or destitute + *-ulus*, diminutive; perhaps from a perception that it appears depauperate, as tiny black dots, often on small rocks) = *Bacidina egenula* (Nyl.) Vězda. Frequent on calcareous and non-calcareous rocks, this species has been misidentified routinely in North America as *Bacidia inundata* (Fr.) Körb. or *Biatora inundata* Fr. It

differs in having a K+ green epithecium. Richard C. Harris has been struggling with the taxonomic disposition of this lichen, and recently has concluded that our material probably is *B. egenula,* a European species. He would be willing to call it *Bacidina egenula* (Nyl.) Vězda, inasmuch as its algae (gonidia) are in goniocysts. Whatever its name, it is a frequent species of dolomitic outcrops, glacial erratics, flagstone, and concrete; there is one specimen from rusty metal. Calkins wrote that it was "in all our territory on detached rocks or stones along streams," and that the thalli were "best shown on sandstones." Some specimens Calkins called "*Verrucaria aethiobola*" are referable here. ~ Spores acicular, 3–4 septate, 25–43 μm × 1.3–2.2 μm.

Boone-MOR, Cook-MOR, DuPage-MOR, Kane-MOR, Lake-Il-MOR, Lake-In-MOR, LaSalle-MOR, Livingston-MOR, McHenry-MOR, Ogle-MOR, Porter-MOR, Starke-MOR, Will-MOR

Bacidia granosa (Tuck.) Zahlbr. (L. *granosus*, full of seeds; from the granulose thallus) This species is infrequent on dolomitic outcrops and HCl+ boulders. Many local specimens recently have been named *Bacidia coprodes* (Körb.) Lett., but Ekman (2014) excludes that species from the western Great Lakes and most of North America, referring our material to *B. granosa*, but leaves room for the possibility that it has been overlooked in North America. The hypothecium of *B. granosa* is lighter in color than the exciple, usually with tinctures of orange or red, while that of *B. coprodes* is darker, almost black and concolorous with the exciple. A similar species, *B. cupreorosella* (Nyl.) A. Schneid., grows on limestone farther south; it has a hyaline hypothecium, while the hypothecium of *B. granosa* is dark. This species also has been called *B. trachona* (Ach.) Lettau by many North American authors. According to Richard Harris (pers. comm.), that is a European species, and our material is referable here. ~ Spores fusiform, 3-septate, 13–18 μm × 2.5–3.5 μm.

Boone-MOR, Cook-MOR, DuPage-MOR, Grundy-MOR, Kane-MOR, Kankakee-MOR, Will-MOR

Bacidia polychroa (Th. Fr.) Körb. (Gr. *poly*, many + *chroa*, superficial color; probably from the apothecia that may vary from pale to reddish or blackish) = *B. fuscorubella* (Hoffm.) Bausch; *Biatora fusco-rubella* of Calkins. Calkins (1896) stated that this species grew on substrates similar to those of *Bacidia rubella*, which see. Actually, all of the Calkins material we have seen that he called *B. rubella* is referable to *B. polychroa.* Generally said to be a corticolous species, the only two local specimens we have seen are from *Acer saccharum*. ~ Spores acicular, 2–15 septate, 31–74 μm × 2–5 μm.

Cook, LaSalle-MOR, Winnebago-MOR

Bacidia rubella (Hoffm.) A. Massal. (L. *rubeo*, to be red, *-ellus*, diminutive; from the tiny reddish apothecia) = *Biatora rubella* of Calkins; *Bacidia luteola* (Schrad.) Mudd. Calkins reported that "This widely diffused species occurs in our county on hickories and oaks. It is variable, and a number of varieties, fourteen or more, have been created species." Generally said to be a corticolous species, the only local contemporary specimen we have seen is from partly shaded limestone with an eastern exposure. ~ Spores acicular, 5–11 septate, 45–75 μm × 3–4 μm.

Cook-F, Ogle-MOR

Bacidia schweinitzii (E. Michener) A. Schneid. (after Ludwig David von Schweinitz, 1780–1834, the German botanist) Known from all around the Southern Lake Michigan region, this species of shaded corticolous habitats has yet to be discovered locally. ~ Spores acicular, 3–15

septate, 32–88 μm × 2–4 μm.

Bacidia suffusa (Fr.) A. Schneid. (L. *suffundere*, to pour into or under; perhaps from apothecia suffused with pruina) = *Biatora suffusa* Fr. In southern Illinois, this species is rare on *Carya* and *Liquidambar*. Calkins (1896) noted it from *Carya* in Will County. ~ Spores acicular, 3–17 septate, 38–91 μm × 2.5–4 μm.

Cook-F,MOR, Will

BAGLIETTOA A. Massal. VERRUCARIACEAE [Photobiont: chlorococcoid. In honor of the Italian lichenologist Franseco Baglietto 1826–1919. ~ Thallus saxicola; perithecia immersed in pits on the substrate; spores 8, simple, hyaline or nearly so; hamathecium gelatinized.] For a comprehensive treatment of this genus see Halda (2003).

1. Purlieus of perithecia stained violet. . . . . B. MARMOREA
1. Violet stains absent.

Exciple hyaline to brownish around the perithecium, the perithecium capped by a flat involucrellum marked by distinct, radiate fissures around the ostiole. . . . . B. BALDENSIS

Exciple black all around the perithecium; ostiole not or only inconspicuously radiate-fissured. B. CALCISEDA

Bagliettoa baldensis (A. Massal.) Vězda (Perhaps after Castelbaldo, Padua, Italy) = *Verrucaria baldensis*. Farther south, this species is rare on hard limestones in glades and along bluffs ~ Asci narrowly clavate, 43–60 μm × 5–15 μm, the spores 16–30 μm × 6–15 μm.

Bagliettoa calciseda (DC.) Gueidan & Cl. Roux (L. *calx*, lime + *sedeo*, to sit; probably from the tendency of the perithecia to seat themselves in depressions in limey rock) = *Verrucaria calciseda*. Rare locally, our only specimens are from dolomite exposures and landscape boulders. There are several specimens from calcareous rock in La Salle County at the Field Museum and the New York Botanical Garden; most of them were called *V. integrella*, one was annotated *V. submuralis* by Fink, and another was called *Staurothele diffractella*. ~ Asci narrowly clavate, 50–70 μm × 15–20 μm, the spores 18–25 μm × 9–13 μm.

DuPage-MOR, Lake-IN -MOR, LaSalle-F,NY, Will-MOR

Bagliettoa marmorea (Scop.) Gueidan & Cl. Roux (L. *marmor,* marble; probably from the substrate of type collections) = *Verrucaria marmorea*. An interesting and uncommonly distinct species, our only record for this lichen is from a dolomite prairie near Wilmington, Illinois. It is a characteristic species of limestone glades farther south. According to Thüs *et al.* (2011) this species in unusual in the Verrucariaceae in having *Trebouxia* as a photobiont. ~ Asci oblong, 30–40 μm × 10–15 μm, the spores 18–28 μm × 10–12 μm.

Will-MOR

BIATORELLA De Not. BIATORELLACEAE. [Photobiont Chlorococcoid. Perhaps from Gr. *biator*, small + L. *-elllus*, diminutive; after the minute, numerous spores. ~ Thallus crustose, terricolous; apothecia yellowish or orange; spores numerous, hyaline, simple.]

Biatorella fossarum (Dufour) Th. Fr. (L. *fossa*, ditch or dug earth; presumably from it terricolous habitat) Yet unknown from the Southern Lake Michigan Region, this species was collected as nearby as Athens, Illinois, in Menard County, where it grew on sterile clay. Evidently rare today, or overlooked, the specimen at the Farlow Herbarium reads, it would appear in Tuckerman's hand, "Not a rare sp. here on sterile clays" Athens, Illinois E. Hall and on the outside of the packet "On the earth 'not rare on sterile clays' Illinois, 14. 1. Hall. 1866." Caleb Morse (personal communication) is of the opinion that Wolf and Hall specimens from Illinois labeled *Biatorella hemispherica* Anzi are referable here; Brodo (2016) considers the latter species to be Arctic/Alpine. According to Morse & Lendemer (2019) *B. fossarum* has spores most more than 8 μm long and apothecia no more than 1 mm across; *B. hemispherica* has spores no more than 8 μm long and larger apothecia more than 1 mm across. Spores oblong-cylindric, 8–13 μm × 3 μm.

BIATORELLACEAE

1. Thallus terricolous. . . . . **Biatorella**
1. Thallus corticolous. . . . . **Strangospora**

BILIMBIA De Not. RAMALINACEAE [Photobiont: green. L. *bi*, double + *limbus*, in reference to the perispore. ~ Thallus muscicolous; apothecia brown to nigrescent, the hypothecium dark-colored; spores 8, hyaline, 3–7 septate; tholus uniformly weakly amyloid; *Bacidia*-type.]

Bilimbia sabuletorum (Schreber) Arnold (L. *sabulum*, sandy; from its supposed frequent occurrence in sandy habitats) = *Bacidia sabuletorum* (Schreb.) Lettau; *Mycobilimbia sabuletorum* (Schreb.) Hafellner. All of the specimens we have are from shaded ravines with dolomitic outcrops, usually growing on mosses over the rock. ~ Apothecia convex; spores narrowly fusiform, 3–5 septate, 18–35 μm × 5–8 μm.

Cass-MIN,MSC, DuPage-MOR, Jefferson-MOR, Kankakee-MOR, Walworth-MOR, Winnebago-MOR

BLASTENIA Th. Fr. TELOSCHISTACEAE [Photobiont: mostly "*Pseudotrebouxia.*" Gr. + *blastos*, a germ, bud, shoot + *-enos*, pertaining to. ~ Thallus crustose, very thin, white or sordid, corticolous or lignicolous; apothecia dome-shaped, orange, without a thalline margin; spores polaribilocular; anthraquinones.]

Blastenia ferruginea (Huds.) Th. Fr. (L. *ferrugo*, rust + *-ineus*, denotes a similar color or material; from the reddish brown apothecia, evocative of the color of rust) = *Caloplaca ferruginea* (Huds.) Th. Fr. *Placodium ferrugineum* (Huds.) Hepp. Our only contemporary record is from the wood of a rail fence. Calkins noted this species from "oaks along the Des Plaines river and near Elgin on hickories . . . plentiful." We have seen a specimen, properly identified (Calkins #318, NY) from "oaks, Illinois." This specimen was later annotated *C. pollinii* by Rudolph, we believe erroneously. [parietin, fallacinal, emodin, and teloschistin] ~ Spores ellipsoid, 11–20 μm × 6–10 μm, the septum 4–8 μm.

Cook-ILL,MOR, Will-ILL

BOTRYOLEPRARIA Canals VERRUCARIACEAE [Photobiont: Chlorococcoid. Gr. *botry*, a bunch or cluster, as in grapes + *lepra*, leprosy + *-arius*, like or connected with; from the shrubby clusters of hyphae and algal cells said to resemble a cluster of grapes. ~ Thallus leprose, lacking cortical development; spores not seen.]

Botryolepraria lesdainii (Hue) Canals (after Maurice Bouly de Lesdain, 1869–1965, French lichenologist) = *Lepraria lesdainii* (Hue) R. C. Harris. Our specimens are from shaded dolomitic cliff faces, in areas sheltered from direct wetting, as are all of our Illinois collections. ~ Thallus blue- green. [lesdainin, a triterpene with RF value just above zeorin]

Cook-MOR, DuPage-MOR, Kankakee-MOR, Kane-MOR, LaSalle-MOR, Lee-MOR, Winnebago-MOR

BRYOBILIMBIA Fryday, Printzen, & Ekman LECIDEACEAE [Photobiont: *Trebouxia*-like, Chlorococcoid. Gr. *bryon*, moss + the genus *Bilimbia*, which see; an allusion to its mossy substrate and affinity to *Bilimbia*. ~ Thallus crustose, more or less granular; apothecia nigrescent; spores 8, hyaline, simple or occasionally 1-septate; axis of ascus apex strongly amyloid, *Porpidia*-type.]

Bryobilimbia hypnorum (Lib.) Fryday, Printzen, & Ekman. (Gr. *hypnon*, a term for certain mosses among the Classical Greeks, Latinized to *Hypnum*, a contemporary genus of moss, + the genitive plural, of the mosses; an allusion to its substrate) = *Mycobilimbia hypnorum* (Lib.) Kalb & Hafellner. Our only record for this species is from LaSalle County where it grew among mosses over rock. ~ Spores 11–17 μm × 5–7.5 μm.

LaSalle-F,MOR

BRYORIA Brodo & D. Hawksw. PARMELIACEAE [Photobiont: *Trebouxia.* A syncopation of the two genera: *BRYopogon* and *AlectORIA*. ~ Thallus fruticose, pendent or bushy; spores 2–8, hyaline to brownish, simple.]

Bryoria furcellata (Fr.) Brodo & D. Hawksw. (L. *furca*, fork + *-ella*, diminutive, + *-atus*, adjective ending; meaning minutely forked) The only local specimens we know of were collected in Pennfield Bog northeast of Battle Creek, in Calhoun County in 1965 and on *Larix* in a bog near Otis Lake, Michigan. Brodo & Hawksworth (1977) report it from St. Joseph County, Indiana. This species characteristically has groups of isidia-like spinules on the soralia. [fumarprotocetraric acid]

Barry-MSC, Calhoun-MSC, St. Joseph-IN

BRYOSTIGMA Poelt & Döbbeler ARTHONIACEAE [Photobiont: Chlorococcoid. Gr. *bryon*, moss + *stigma*, point, dot, or tattoo; from the scattered, corticate, yellow, spherical granules; evidently from its appearance on mosses. ~ Thallus crustose,

epiphloedeal; apothecia round, convex, immersed or superficial; black; asci broadly clavate, pale blue in IKI when pretreated with KOH; interthecial hyphae indestinct; asci broadly clavate; spores 8, hyaline, 1-septate, one cell slightly larger than the other.]

Bryostigma muscigenum (Th. Fr.) Frisch & G. Thor (L. *muscus,* moss + *-gena*, born; from its appearance on mosses) Generally said to be confined to *Populus*, particularly *P. tremuloides*, our only record is from a smooth-barked landscape trees in corporate parks, with *Amandinea dakotensis, Hyperphyscia confusa, Hyperphyscia syncolla, Lecanora carpinea, Physcia millegrana, Physcia stellaris, Physciella chloantha*, and *Xanthoria parietina*. ~ Thallus scant, grayish or darker, the apothecia notably convex and appearing biatorine; epithecium dark brown, about a fourth the height of the hymenium; hypothecium dark brown; spores 2-celled at maturity, one cell larger than the other, 8–12 μm × 3.5-5 μm. We are not truly certain that this is the proper name for our material, or if even our material represents a single entity. Generally our spores range a little larger than is usually given, particularly if the larger cell and not the septum is the metric.

Boone-MOR, Cook-MOR, DeKalb-MOR

BUELLIA De Not. CALICIACEAE [Photobiont: *Chlorococcoid*. After Esuperanzo Buelli (d. 1840), friend of De Notaris. ~ Thallus crustose, usually well developed, with or without secondary metabolites; apothecia without a thalline margin in age; spores 8, brown, 1(3)-septate; conidia elliptical to bacilliform.]

1. Apothecia and thallus K–.
   - Thallus saxicolous.. . . . . B. BADIA
   - Thallus corticolous or lignicolour. . . . . B. SHAERERI

1. Apothecia and thallus notably K+ yellow to red.
   - Thallus corticolous. . . . . B. ERUBESCENS
   - Thallus saxicolous. . . . . B. MACULATA

Buellia badia (Fr.) A. Massal. (L. *badius*, bay, reddish or dull brown,) This species resembles the tumescent *B. maculata*, but it reacts K– instead of K+ red. Infrequent, we have one specimen from weathered wood and two from an HCl– boulders in full sun. Local reports of *Buellia turgescens* are referred here. ~ Spores 10–14 μm × 5.0–7.5 μm.

McHenry-MOR, Will-MOR

Buellia erubescens Arnold (L. *erubescens*, blushing, reddening, as if from shame, perhaps from its reaction to the K spot test) = *Buellia stillingiana* J. Steiner.; *Buellia parasema* of Calkins. This is a frequent lichen on corticolous substrates just south of the Southern Lake Michigan region, but it is infrequent locally. Our contemporary specimens are from *Gleditsia triacanthos* and *Rhamnus cathartica*. Richard Harris (pers. comm.) believes that Calkins's report of *B. disciformis* is likely to be based upon material of *B. erubescens*, a theory reinforced by the fact that Imshaug (1951) cited a Cook County specimen of *B. stillingiana* and excluded *B. disciformis* from the Southern Lake Michigan region. ~ Thallus K+ red; spores 11–15 μm × 6.5–8.0 μm. [norstictic acid, ± atranorin]

Cook, DuPage-MOR, Jefferson-WIS, LaSalle-NY, Ogle-MOR

Buellia maculata Bungartz (L. *maculatus*, spotted; perhaps from the appearance of numerous tiny black apothecia) = *Buellia stigmaea* Tuck. Our only record for this species is from a sandstone cliff at Castle Rock State Park. ~ Thallus K+ red; spores 9–14 μm × 3.5–6.0 μm. [norstictic acid, atranorin]

Ogle-MOR

Buellia schaereri De Not. (in honor of Swiss cryptogamist, Ludwig Emanuel Shaerer, 1785–1853) Most frequent on *Larix laricina* in bogs, our only records are from *Salix* bark in a bog southwest of Dousman and a decorticate fence rail in DuPage County. ~ Similar in many respects to *Amandinea punctata* but with a paler thallus and with smaller spores: 6–10 μm × 2.5–4.0 μm.

DuPage-MOR; Rock-MOR, Waukesha-MOR,WIS

CAERULEUM A. Massal. ACAROSPORACEAE [Photobiont: Chlorococcoid. L. *caeruleus*; pertaining to the sea or sky, especially with the blended tinctures of blue and green; probably from the greenish pruina. ~ Thallus crustose, saxicolous, minutely areolate; apothecia with greenish pruina; spores numerous, minutely bacilliform, simple.]

Caeruleum immersum (Fink) K. Knudsen & L. Arcadia (L. *immersus*, immersed; from the apothecia immersed in the thallus) = *Acarospora immersa* Fink. The Porter County specimen was collected at Howes Prairie, on HCl+ rock in open oak woodland. ~ Spores 6–10 μm × 2.5–4.0 μm.

Porter-MIN

CALICIACEAE

A. Ascospores numerous
  Apothecia stalked. . . . . **Calicium**
  Apothecia sessile. . . . . **Cyphelium**
A. Ascospores no more than 64 per ascus.
  B. Thallus foliose. . . . . **Pyxine**
  B. Thallus crustose.
    C. Thallus yellow or white, more or less placoidioid.
      Thallus white; spores submuriform. . . . . **Diplotomma**
      Thallus yellow; spores 1-septate. . . . . **Dimelaena**
    C. Thallus neither yellow nor white, not placoidioid.
      Thallus well-developed, usually with secondary metabolites; apothecia lacking a thalline margin concolorous with the rim. . . . . **Buellia**
      Thallus scant to areolate, without secondary metabolites; apothecia with a thalline rim, or if without, then with a very thin thallus or with spores more than 15 μm . . . . . **Amandinea**

CALICIUM Pers. CALICIACEAE [Photobiont *Trebouxia*. Gr. *kalyx*, a cup; from the cup-shaped apothecia. ~ Thallus corticolous or lignicolous; apothecia stipitate, nigrescent, urceolate to cylindrical, disintegrating into a mazaedium; spores numerous, ellipsoid, 1-septate, brown, ornamented; conidia broadly ellipsoid.]

1. Apothecial capitulum at least sparsely white pruinose on the exciple. . . . . C. GLAUCELLUM
1. Apothecial capitulum without pruina. . . . . C. ABIETINUM

Calicium abietinum Pers. (L. inhabiting the fir tree, *Abies)* Our only record is from a "dead tree" at Hope Lake Bog. ~ Thallus endophloedeal; apothecia not pruinose. ~ Spores smooth to ornamented with cracks and ridges, 11–15 μm × 5–7 μm.

Jefferson-WIS

Calicium glaucellum Ach. (L. *glaucus*, pale blue or whitish + *-ellus*, diminutive) Our only record for this species is from a white oak in "Waldron, Illinois," which village is now known as Aroma Park. ~ Thallus endophloedeal; apothecia at least thinly white-pruinose on the edge of the capitulum and on the distal portion of the stalk. ~ Spores ornamented with cracks and ridges, 9–13 μm × 4–6.5 μm.

Kankakee-F

CALOPLACA Th. Fr. TELOSCHISTACEAE [Photobiont: mostly *"Pseudotrebouxia."* Gr. *kalos*, beautiful + *plax*, a flat round plate, dish; from the attractive, round, yellow apothecia, resembling plates, of some species. This is a genus, along with related genera in the Teloschistaceae, in which it can be distinctly ungratifying to name specimens. Much of the contemporary literature is at variance in interpretation and there is no comprehensive monograph for North America. With a few exceptions, most of the following names should be regarded as provisional. ~ Thallus crustose to squamulose or placodioid; apothecia with a proper margin and many species with a thalline margin as well; spores 8, hyaline, polaribilocular. Most species contain anthraquinones, particularly parietin.]

1. Thallus K+ deep red.
   2 Thallus sorediate, not effigurate, without discernable corticate margins. . . . . C. MICROPHYLLINA
   2. Thallus esorediate, effigurate, with discernable corticate margins. . . . . C. SAXICOLA
1. Thallus K– or absent.
   2. Apothecial disks at least thinly pruinose.
      Apothecial disks buff or brownish, K–. . . . . C. CAMPTIDIA
      Apothecial disks yellow-orange, K+ red.. . . . . C. ULMORUM
   2. Apothecial disks epruinose.
      3. Apothecial disks yellow to orange, notably K+ deep red or reddish, the epihymenium K+ red to red-violet.
         4. Thallus not evident. . . . . C. AHTII
         4. Thallus evident.
            Thallus lignicolous or corticolous.. . . . . C. CERINA
            Thallus saxicolous. . . . . C. SIDERITIS
      3. Apothecial disks brown to black, K–, the epihymenium sometimes K+ purple.
         5. Thallus saxicolous
            Thallus with soredia developed from an eroding cortex. . . . . C. PRATENSIS
            Thallus esorediate. . . . . C. ATROALBA
         5. Thallus corticolous.
            Epihymenium K+ violet; thallus pale. . . . . C. POLLINII

Epihymenium K–; thallus sordid. . . . . C. BRUNNEOLA

Caloplaca ahtii Søchting (in honor Finnish lichenologist, Teuvo Ahti, 1934– , Research Associate in the Botanical Museum, Finnish Museum of Natural History) Yet unknown locally, this species is rather frequent just north of our region, where is grown on *Populus*. At first glance it might be passed off as *Athallia holocarpa*, at least as we have presented it for this region, but the spore septum is shorter than to about ⅓ as long the spore, usually less than 4.0 μm. ~ Thallus absent or of scattered and more or less sorediate. ~ Thallus endophloeic, apothecia K+ purple, yolk yellow with a paler margin, 0.1–0.5 mm across.

Caloplaca atroalba (Tuck.) Zahlbr. (L. *ater,* black + *albus,* white; probably from the dark disks and pale-colored rims) This species was first discovered from Illinois by Richard Harris, who found it mixed with Calkins's specimen of *Lecania perproxima* at the New York Botanical Garden. There are contemporary records from the Southern Lake Michigan region, in LaSalle, Livingston, and Will Counties, where it grows on base-rich bedrock, often within the zone of fluctuation. A Calkins specimen (#1752 NY) from Will County was originally named *Lecanora aipospila*. ~ Thallus crustose, areolate to more or less rimose; apothecia flat, epruinose, nigrescent. Many early specimens of this species were labeled "*Lecania perproxima*." ~ Thallus continuous to rimose-areolate, gray to olivaceous; apothecia K+ purple; spores 14–17 μm × 7–8.5 μm, the septum 1.5–3 μm. [anthraquinones, thalloidima green]

Boone-MOR, Cook-NY, DeKalb-MOR, Kankakee-MOR, Kenosha-MOR, LaSalle-F,MOR,PH,NY, Lee-MOR, Livingston-MOR, Ogle-MOR, Will-MOR,NY

Caloplaca brunneola Wetmore (L. *brunneus,* dark brown + *-olus,* diminutive; from the color of the apothecial disks) Our only record for this species is from the bark of an open-grown tree of *Quercus rubra*. It is occasional farther south on a wide variety of deciduous trees and on *Juniperus virginiana*. ~ Thallus sordid, more or less continuous to areolate near the margins; apothecia dark brown, K–; spores 9–12 μm × 5–6 μm, the septum 4.5–7 μm.

DuPage-MOR

Caloplaca camptidia (Tuck.) Zahlbr. (Gr. *kampto,* to bend + L. *-idus,* diminutive; perhaps from the sometimes flexuous margins) Yet unknown from the Southern Lake Michigan region, this species occurs farther south, where it is rare on both hardwoods and junipers. ~ Thallus continuous to areolate, grayish, apothecia tan to brown, K–, pruinose; spores 11–12 μm × 6 μm, the septum 5–6 μm.

Caloplaca cerina (Hedwig) Th. Fr. (L. *cerinus*, yellowish, the color of yellow wax; from the color of the apothecia) Occasional on weathered wood and the bark of *Populus*. An early Cook County specimen at ILL was named *Placodium ferrugineum* by Calkins. There is a modern Cook County record from a wooden fence rail. ~ Thallus pale to dark gray, concolorous with the thalline margins of the apothecia; apothecial disks orange, epruinose, K+ purple; spores 12–14 μm × 5–8 μm, the septum 5–7 μm.

Allegan-MSC, Barry-MSC, Berrien-MIN, Cook-ILL,MOR, DuPage-MOR, Kane-MOR, Lake Il-MOR, McHenry-MOR, Ottawa-MOR, Porter-MIN, Rock-MOR, Waukesha-MOR

Caloplaca microphyllina (Tuck.) Hasse (Gr. *mikros*, small + *phyllon*, leaf + L. *-inus*, pertaining to; perhaps from the occasional, tiny, flattened, areoles) = *Placodium microphyllum* of Calkins. Fink

(1935) spells the epithet "*microphylina*." Rudolph (1955) placed this species in the genus *Gasparinia*. Common on weathered wood, this is the orange swatch that appears on farm wood and fences in the agricultural districts. It often grows with *Physcia millegrana* and *Amandinea punctata*. ~ Thallus granular-sorediate, K+ deep orange; apothecia rare; spores 10–14 μm × 5–7 μm, the septum 3–4 μm.

Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kalamazoo-NY, Kane-MOR, Kendall-MOR, Kosciusko-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-CUP, Lee-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Ogle-MOR, Racine-MOR, Rock-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Caloplaca pollinii (A. Massal.) Jatta (after Ciro Pollini, 1782–1833, Italian physician and botanist) Farther south, this species grows on *Juniperus virginiana* in natural areas. The Cook (Calkins #53, MICH) and Kane (Fink, July 1895, MICH) county specimens were confirmed by Wetmore (1994). The LaSalle County record (Calkins #277, F) was collected on bark from a tree along the Illinois River. The Rock County record is reported by Thomson (2003). ~ Thallus pale to dark gray; apothecia brown or dull brownish orange to black, the rim essentially concolorous with the disk, K–, although the epihymenium is K+violet in section, which feature if missed might lead to confusion with *Blastenia ferruginea*; spores 11–20 μm × 6–10 μm.

Cook-MICH, Kane-MICH, LaSalle-F, Rock

Caloplaca pratensis Wetmore (L. pratensis, of the meadows) This western species has be collected from as nearby as Piatt County (KU), where it grew on the sandstone-mortar of a retaining wall. A similar species, *C. concreticola* Vondrák & Kodosovtsev (L. *concrescere*, to grow together, concrete + *cola*, inhabiting) has an esorediate thallus; it is a European species but has been documented in the upper Midwestern United States. ~ Thallus thick, areolate, sorediate on the surfaces; spore septum 1.0–2.0 μm wide.

Caloplaca saxicola (Hoffm.) Nordin (L. *saxum,* stone + *colo,* to inhabit; from its inhabitancy of rocks) Our only local record for this species is from a dolomitic outcrop above the Des Plaines River, in DuPage County. The next nearest known record is from a limestone outcrop in Stephenson County, Illinois. ~ Thallus K+ purple, the lobes to 1.5 mm long, the apothecia developed on the younger portions, K+ purple; spores 11–14 μm × 5.5–7 μm, the septum 2–4 μm. [anthraquinones]

DuPage-MOR

Caloplaca sideritis (Tuck.) Zahlbr. (Gr. *sideros*, iron or things made from iron + *-ites*, belonging to or having to do with; from the iron to greenish gray thallus) This species is occasional on granitic and dolomitic erratics, and on dolomitic outcrops and cliff faces. ~ Thallus pale to sordid gray, areolate to continuous, K– ; apothecia sessile to adnate, the disk more or less flat, 0.2–0.8 mm across, rusty orange to nigrescent, K+ purle, the proper exciple darker, the lecanorine margin concolorous with the thallus; spores 11–14 μm × 5.5–7 μm, the septum 3–5 μm. [anthraquinones, thalloidima green]

Boone-MOR, Cook-MOR, DuPage-MOR, Grundy-MOR, Jefferson-MOR, Kane-MOR, Kendall-MOR, LaSalle-MIN,MOR,NY, Lake-IN -MOR, Lee-MOR, McHenry-MOR, Milwaukee-WIS, Ogle-MOR, Walworth-MOR, Will-MOR, Winnebago-MOR

Caloplaca ulmorum (Fink) Fink (L. *ulmus*, the elm; of elm trees) Our only contemporary local

records are from the bark of *Populus.* There is a specimen from just west of the Southern Lake Michigan region, which grew on the trunk of *Juglans nigra* in a partly open mowed area. There are several Calkins specimens of this species at the New York Botanical Garden, all of which Calkins had called *Placodium aurantiacum.* The Ford County record is from a dolomite headstone. ~ Thallus white, K– ; apothecia yellow pruinose, K+ purple, the rim concolorous with the thallus; *s*pores 8–18 μm × 5–10 μm. [anthraquinones]

Barry-MICH, Cook-NY, Ford-MOR, Kane-MICH, Lake Il-MOR, LaSalle-NY, Lee-MOR, McHenry-MOR

CANDELARIA A. Massal. CANDELARIACEAE [Photobiont: *Trebouxia*. L. *candela,* candle + *-arius*, belonging to; from the yellow color, like the glow of a candle. ~ Thallus foliose, yellow, K–; apothecia yellow concolorous with the thalline margin; lower cortex white; spores small, usually more than 32, hyaline, simple or rarely 1-septate; all species contain calycin and pulvinic dilactone.]

1. Thallus esorediate. . . . . C. FIBROSA
1. Thallus sorediate. . . . . C. CONCOLOR

Candelaria concolor (Dicks.) Stein (L. *concolor*, the same color; from the fact that the apothecia and, perhaps, the soredia, are the same color as the thallus) = *Theloschistes concolor* of Calkins. This species, with the possible exception of *Physcia millegrana*, is the most common lichen in the Southern Lake Michigan region. It accounts for most of the yellow swatches that are so characteristic of suburban trees such as *Acer negundo, Fraxinus lanceolata, Populus deltoides,* and *Ulmus americana.* Other trees from which we have local specimens include *Aesculus sylvatica, Betula papyrifera, Carya cordiformis, Carya ovata, Celtis occidentalis, Crataegus spp., Fraxinus americana, Juglans nigra, Juniperus virginiana, Maclura pomifera, Populus alba, Populus deltoides, Prunus serotina, Quercus alba, Quercus velutina, Salix nigra*, and *Ulmus pumila*. It also grows on fence posts and rails, concrete, dolomitic erratics and outcrops, and tombstones. It commonly produces small thalli on *Phaeophyscia ciliata, Phaeophyscia pusilloides*, and *Physcia stellaris*. Sometimes the thallus is so profusely covered by soredia that nearly concealed, some of the granules scattered on the substrate and even on other lichens. Such lichens have been cal var. "*effusa*," and are perhaps distinct at the varietal level, but the type of var. *effusa* is a *Candelariella*, so there is no legitimate name for the variety, which seems to be more frequent in our eastern sector. See also *Candelariella efflorescens* as well as the discussion in Lendemer & Westberg (2011). ~ Principal thallus flat and distinctly lobed.

Allegan-MOR,MSC, Barry-MOR,MSC, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MICH,MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR,WIS, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR,MSC, Kosciusko-MOR,NY,MICH, LaGrange-MOR, Lake IL-MOR, Lake In-MIN, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR-NY, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ottawa-MOR, Porter-INDU,MOR, Pulaski-MOR Racine-MOR, Rock-MOR,WIS, Steuben-MOR, St. Joseph In-MOR, Starke-MOR, Van Buren-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Candelaria fibrosa (Fr.) Müll. Arg. (L. *fibra,* a fiber or filament + *-osus*, denotes abundance or fullness; probably from the dense ring of white fibers that invests many apothecia) Rather

abundant on canopy branches farther west; until its recent appearance on *Acer negundo* and *Gleditsia triacanthos* in DuPage County, it had not been collected in Illinois since the 1800's. There are specimens from Glencoe, in Cook County.

Cook-F,FH,NY, DuPage-MOR, Kane-MOR

CANDELARIACEAE

A. Thallus crustose; spores usually simple, 8–32 per ascus. . . . . **Candelariella**
A. Thallus foliose; spores 1-septate; more than 30 per ascus. . . . . **Candelaria**

CANDELARIELLA Müll. Arg. CANDELARIACEAE [Photobiont: Chlorococcoid. Diminutive of *Candelaria*. ~ Thallus crustose, yellow, dispersed granular or minutely squamulose, K–; Spores 8–32, hyaline, simple or rarely 1-septate. All species contain calycin, pulvinic dilactone, and pulvinic acid.]

1. Thallus notably sorediate or of corticate granules no more than 0.15 mm in diameter; apothecia rare; corticolous or lignicolous.
   Thallus of scattered, globose, distinctly corticate, more or less evenly distributed granules. . . . . C. XANTHOSTIGMA
   Thallus sorediate, with ecorticate granules more or less clustered into soralia. . . . . C. EFFLORESCENS
1. Thallus absent or of small squamules, areoles, or granules more than 0.15 mm in diameter; apothecia usually present; corticolous, lignicolous, or saxicolous.
   Areoles generally scattered; spores 8 per ascus. . . . . C. AURELLA
   Areoles densely clustered, often with slightly effigurate margins; spores 16–32. . . . . C. VITELLINA

Candelariella aurella (Hoffm.) Zahlbr. (L. *aurum*, gold + *-ella*, diminutive; from the tiny yellow apothecia) = *Placodium vitellinum* var. *aurellum* of Fink (1906). Most of our specimens are from weathered concrete or some other allochtonous HCl+ substrate, commonly in association with *Myriolecis dispersa*. There are two specimens from lignin that are evocative of *Candelariella antennaria* Räsänen, but the thallus consists of gray, convex areoles. See the article by Yakovchenko *et al.* (2017). ~ Epithecium yellow with brownish granules; asci clavate; spores 8, simple, 12–17 μm × 4–6 μm.

Barry-MOR, Cass-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Kane-MOR, Kenosha-MOR, Kent-MOR, LaGrange-MOR, Lake IN-MOR, Lake-IN-MOR, Lee-MOR, Livingston-MOR, Noble-MOR, Ogle-MOR, Ottawa-MSC, Racine-MOR, Rock-MOR, Steuben-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Candelariella efflorescens R. C. Harris & Buck (L. *efflorescens*, very rarely flowering) More than half of the Southern Lake Michigan region specimens are from the bark of *Crataegus* species and *Quercus velutina*, though we also have it from *Q. macrocarpa, Juglans nigra, Prunus serotina, Tilia americana*, and weathered fence rails. The only Southern Lake Michigan region specimen that we have seen with apothecia was from a Bur Oak; it bore asci with 32 spores. Harris & Buck (1978) map it from areas all around the Southern Lake Michigan region, particularly north and east of us. Our lower Midwestern specimens infrequently produce apothecia, but all that we have seen have 8-spored asci and are referable to *C. xanthostigmoides* (Müll. Arg.) R. W. Rogers, which locally also has been called *C. efflorescens* (Nyl.) Lettau. All local reports of "C. reflexa" are referred here.

For a discussion on these two taxa see Lendemer & Westberg (2010). Very sorediate species of *Candelaria concolor* may key here as var. "*effusa*," but the soredia originate from tiny areoles and lack even small lobes.

Allegan-MOR,MSC, Barry-MOR, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MSC, Cass-MOR, Cook-MOR, DuPage-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, Milwaukee-MOR, Newton-MOR, Ogle-MOR, Porter-INDU,MIN, Pulaski-MOR, Racine-MOR, Rock-MOR, St. Joseph IN-MOR, Starke-MOR, Steuben-MOR, Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR

Candelariella vitellina (Hoffm.) Müll. Arg. (L. *vitellus*, egg yolk + *-inus*, pertaining to; from the tiny yellow apothecia) = *Placodium vitellinum* of Calkins. Most northern Illinois specimens are from sandstone exposures, but the only Southern Lake Michigan region saxicolous specimens we have seen are from igneous boulders. It is also occasional on lignin, such as old fence rails and wood, from which substrate it is reported by Calkins. We also have specimens from *Quercus alba* and *Q. macrocarpa.* On wood or bark it could be mistaken for *C. xanthostigma*, but the thallus granules of *C. xanthostigma* are smaller, more spherical, and not as coalesced. ~ Epithecium yellow with brownish granules; asci clavate; spores 16-24, simple, 8–12 μm × 3.5–5 μm.

Cass-MOR, Cook-CASC, DuPage-MOR, Ford-MOR, Jasper-MOR, Jefferson-WIS, Kane-MOR, LaSalle-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Racine-MOR, Rock-WIS, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Candelariella xanthostigma (Ach.) Lettau (Gr. *xanthos*, the various shades of yellow + *stigma*, point, dot, or tattoo; from the scattered, corticate, yellow, spherical granules) Seventy-five percent of Southern Lake Michigan region specimens are from species of *Quercus*, but there are also specimens from *Tilia americana, Juglans nigra, Carya ovata, Populus grandidentata,* and weathered fence rails.

Barry-MSC, Berrien-MIN, Branch-MICH, Calhoun-MICH, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MIN, La Porte-MIN,MOR, LaSalle-ILL,MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Ogle-MOR, Porter-INDU,MIN, Pulaski-MOR, Racine-MOR, Rock-MOR, Starke-MOR, Steuben-MOR, Walworth-MOR, Waukesha-WIS, White-MOR, Will-MOR

> **CANOPARMELIA** Elix & Hale PARMELIACEAE [Photobiont: *Trebouxia.* L. *canus*, gray; a gray *Parmelia*, which see. ~ Thallus foliose, gray to blue-gray above, the lower cortex dark, rhizinate with simple to forked rhizines; spores 8, hyaline, simple.]

Canoparmelia texana (Tuck.) Elix & Hale (of Texas) = *Pseudoparmelia texana* (Tuck.) Hale. The earliest record for this southern species locally is based upon two collection made in Jefferson County, on *Larix laricina* at Hope Lake Bog (Thomson 1963 WIS), a native habitat. More recent collections are from trees in cultural landscapes, on *Gleditsia triacanthos, Pinus banksiana, Prunus serotina,* and *Tilia cordata*. The Kosciusko record is from weathered fence rail. Based upon other records from the Midwest, there is evidence that appears to have been moving northward in recent years. ~ Upper cortex smooth, wrinkled in age, but never foveolate or reticulate; lower cortex brown and rhizine-free at the margins; soralia and medulla UV+ bright white. [divaricatic

acid].

Berrien-MOR, DuPage-MOR, Jefferson-WIS, Kosciusko-MOR

CATILLARIA A. Massal. CATILLARIACEAE [Photobiont: Chlorococcoid. L. *catillus*, a small dish or plate + *-arius*, belonging to or resembling; possibly from the small dish-like apothecia. Apothecia lecideine, spores 8, hyaline, 1-septate.]

1. Thallus corticolous; apothecia nigrescent. . . . . C. NIGROCLAVATA
1. Thallus saxicolous; apothecia brown.
   Thallus on siliceous rocks; apothecia black, the exciple dark throughout. . . . . C. CHALYBEIA
   Thallus on base-rich rocks; apothecia brown, the exciple pale marginally. . . . . C. LENTICULARIS

Catillaria chalybeia (Borrer) A. Massal. (L. *chalybeius*, of iron; the allusion unclear unless it relates to the often steel-gray thallus) Yet unknown from the region, this species grown on siliceous rocks nearby. ~ Paraphyses mostly simple, swollen and nigrescent distally; hypothecium hyaline to brown; spores 9–13 μm × 3–4.5 μm.

Catillaria lenticularis (Ach.) Th. Fr. (L. lenticularis, lens-shaped) Our only record is from Galena dolomite along the Fox River, growing with *Lecania perproxima* (Wilhelm & Young #16708 MOR). Apothecia brown, the exciple pale marginally. ~ Paraphyses mostly simple, swollen and nigrescent distally; hypothecium pale; spores 7–10 μm × 2.4–4 μm.

Kendall-MOR

Catillaria nigroclavata (Nyl.) Schuler (L. *niger*, black + *clavatus*, club-shaped; probably from the dark-pigmented club-shaped paraphyses tips and the dark epithecium) Probably more frequent than the records indicate, this tiny lichen grows on the smooth round twigs of trees, usually in natural areas, including *Juglans nigra, Populus deltoides, Prunus serotina,* and *Quercus rubra*. ~ Often growing with *Amandinea dakotensis*, it would be easy to pass this species off as *A. punctata* if one were to be to lazy to look at the spores. When viewed from above, the black clavate tips of the paraphyses give the epithecium a minutely granular appearance. ~ Asci long-clavate, 26–33 × 5–7 μm; spores becoming 1-septate, 7–12 μm × 2.1–3.6 μm; swollen tips of paraphyses 3–4.5 μm in diameter.

Berrien-MIN, DuPage-MOR

CATILLARIACEAE

1. Apothecia lecideine; paraphyses abruptly expanded distally into nigrescent globose cells. . . . . **Catillaria**
1. Apothecia lecanorine; paraphyses without abruptly expanded and nigrescent globose cells. . . . . **Halecania**

CETRARIA Ach. PARMELIACEAE [Photobiont: *Trebouxia.* L. *caetra*, a leather shield + *-arius*, like or connected with; from the shape and texture of the thallus. ~ Thallus fruticose to more or less foliose, the branches flattened or folded, commonly with pseudocyphellae; spores 8, hyaline, simple.]

Cetraria arenaria Kärnefelt (L. *arena*, sand + *-arius*, like or connected with; from its sandy soil habitat) The only record for this boreal species in the region of southern Lake Michigan is at

Illinois Beach State Park, where it grows in sand prairie near the lake, with *Helianthus occidentalis, Andropogon scoparius, Arctostaphylos uva-ursi coactilis, Arabis lyrata, Juniperus horizontalis, Solidago speciosa, Smilacina stellata, Opuntia humifusa, Carex umbellata, C. richardsonii, Sorghastrum nutans, Draba reptans*, and *Arenaria stricta*. ~ Thallus brown or olivaceous, the lobes forked, folded or incurled, with marginal pseudocyphellae. [protolichesterinic acid, lichesterinic acid]

Lake Il-ILL,LSU,MOR

CHAENOTHECA Ach. CONIOCYBACEAE [Photobiont: *Stichococcus* or *Trebouxia.* Gr. *chainein*, gaping + *theke*, box or receptacle; the allusion not singularly evident. ~ Thallus leprose to inconspicuous; ascoma stipitate, a mazaedium, the spores hyaline to yellowish or brownish, simple, globose; conidia ovoid.]

Chaenotheca furfuracea (L.) Tibell () Photobiont: *Stichococcus.* Yet unknown from the Southern Lake Michigan Region, this species is known from districts nearby all around us. ~ Thallus leprose, bright yellow; apothecia yellowish pruinose; spores 2.5–3 μm in diameter. [vulpinic acid]

CHAENOTHECOPSIS Ach. MYCOCALICIACEAE [Photobiont: absent. *Chaenotheca* + Gr. *-opsis*, resembling; the allusion evident. ~ Ascoma stalked, black, the capitulum obovoid or lenticular; asci 8-spored, not forming a mazaedium; spores simple or 1-septate, pale to brown.]

Chaenothecopsis perforata Rikkinen & Tuovila (L. *per*, through + *forare*, to pierce; pierced through) Our only records for this species are those cited by Gockman, *et al.* (2019), who note that many "exudate flows on which *C. perforata* occurs, appear to originate from "frost cracks" or ruptures in the bark [of *Rhus*]. . . Others appear to originate from damaged bark caused by insects, birds, or mechanical damage. One collection of *C. perforata* was made from bud scars on older branches of *R. typhina*, which may be a regular niche for the species. *Chaenothecopsis perforata* occurs on the shiny black resin that forms in chambers under damaged portions of bark as well as on dull/matte brown to tan . . . resin that accumulates on the outside of the bark." ~ Stalk and capitulum black; asci cylindrical, the spores uniseriate, simple, grayish to brownish, 5–7 μm × 2–3.5 μm.

Allegan-MIN, Van Buren-MIN

CHRYSOTHRICACEAE

One local genus. . . . . **Chrysothrix**

CHRYSOTHRIX Mont. CHRYSOTHRICACEAE [Photobiont: *Chlorella.* Gr. *chrysos*, gold + *thrix*, the hair; perhaps from the tangled yellow hyphae. ~ Thallus leprose yellow to yellowish green, without cortical development; apothecia, if present, subimmersed, flat or low-convex; interthecial hyphae obscure, the epithecium brown, several layers of hyphae; asci clavate, pale blue in IKI when pretreated with KOH, the tholus evident; spores 8, 3-septate.]

1. Thallus bright yellowish; apothecia absent. . . . . C. XANTHINA
1. Thallus without significant tinctures of yellow; apothecia present, usually pruinose. . . . . C. CAESIA

Chrysothrix caesia (Flotow) Ertz & Tehler (L. *caesius*, bluish gray; from the pruinose apothecia) = *Arthonia caesia* (Flotow) Körb., *A. lecideella* Willey This is a very distinctive lichen, characterized by a protococcoid photobiont and a sub-leprose, yellowish green thallus bespeckled with whitish or bluish frosted [triterpenoid crystals] apothecia. This species is common on a wide variety of corticolous substrates, particularly *Carya ovata, Populus deltoides, Quercus alba, Q. velutina, Tilia americana*, and the smooth bark of young saplings. It is occasional on old wood. Many of the thalli in the metropolitan Chicago area lack apothecia, which are most evident in the more remote rural areas. Some specimens labeled "*Arthonia lecideela*" are referable here. ~ Asci clavate, 31–35 μm × 12–16 μm; spores 8, 3-septate, constricted at the middle, 1 pair usually slightly the larger, 20–24 μm × 5.8–7.2 μm. Occasional specimens are epruinose. [triterpenes, usnic acid]

Allegan-MOR,MSC, Barry-MSC, Berrien-MOR, Boone-MOR, Branch-MICH, Calhoun-MSC, Cass-MOR, Cook-F,ILL,MOR,NY, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR,WIS, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR,NY, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR,MSC, Porter-MIN,MOR, Pulaski-MOR, Racine-MOR, Rock-MOR,WIS, St.Joseph In-MOR, Starke-MOR, Steuben-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Chrysothrix xanthina (Vain.) Kalb (Gr. *xanthos*, the various shades of yellow + *-inus*, pertaining to; an obvious allusion to the yellow granular thallus) = *Chrysothrix candelaris* of local authors, but Harris and Ladd (2008), which see, finally realizing that size matters, exclude this species from North America. *Chrysothrix xanthina* is known from as nearby as Stephenson County, Illinois, where it grew at the base of an open-grown *Quercus alba*. Elsewhere, it also grows on siliceous rocks. A similar saxicolous species, *C. chlorina* (Ach.) J. R. Laundon (Gr. *chloros*, green, greenish yellow + *-inus*, pertaining to), differs in that the thallus is easily separated from the substrate, *C. xanthina* too firmly attached to be pealed away. Apothecia unknown. [pinastric acid only]

CIRCINARIA Link MEGASPORACEAE [Photobiont: *Trebouxia.* L. *circinatus*, of or relating to a coil + *arius*, like or connected with. ~ Thallus crustose, saxicolous, continuous to areolate; apothecia immersed, the paraphyses moniliform; spores 4–8, hyaline, simple, ovoid.]

1. Thallus areolate or not, but without heavily pruinose thalline rims around sunken apothecia; on HCl– rock. . . . . C. CAESIOCINEREA
1. Thallus areolate, many areoles with deeply seated apothecia surrounded by heavily pruinose thalline rims; on dolomite.
   Thallus white or pale greenish white or gray, the areoles more or less contiguous; spores 8. . . C. CALCAREA
   Thallus grayish, the areoles discontinuous or scattered; spores 4–6. . . . . C. CONTORTA

Circinaria caesiocinerea (Malbr.) A. Nordin, Savić, & Tibell (L. *caesius*, bluish gray + *cinereus*,

ash-colored; from the color of the thallus) Infrequent locally on weathered granite boulders, this species is not uncommon just to the west of the Southern Lake Michigan region, where it occurs on sandstone in Lee and Ogle counties. ~ Spores 17– 30 μm × 20–25 μm. [aspicilin]

Cook-MOR, DuPage-MOR, Kane-MOR, Kendall-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR

Circinaria calcarea (L.) A. Nordin, Savić, & Tibell (L. *calcarius*, pertaining to or of lime; from the carbonate-rich substrate) = *Lecanora calcarea* of Calkins (1896), who reported this species from "calcareous rocks at Joliet." One cannot help but wonder if the report is based upon the much more locally frequent, *Circinaria contorta*, although he made a distinction by reporting "var. *contorta*" as well. ~ Spores 15– 27 μm × 9–22 μm. [aspicilin]

Will

Circinaria contorta (Hoffm.) A. Nordin, Savić, & Tibell (L. *contortus*, full of twists and turns; perhaps from the irregular, centrally elevated and marginally depressed areoles) = *Lecanora contorta* (Hoffm.) J. Steiner; *L. calcarea* var. *contorta* of Calkins, *Verrucaria nigrescens* of Calkins. Our only specimens of this species are from dolomitic outcrops in dry prairie. ~ Spores 16– 30 μm × 12–20 μm. [aspicilin]

Boone-MOR, Kane-MOR, LaSalle-NY, Will-F,ILL,MOR,NY, Winnebago-MOR

CLADINA (Nyl.) Harm. CLADONIACEAE [Photobiont: *Trebouxia.* Gr. *kladion*, a small branch; from the finely branched podetia. Some authorities have placed *Cladina* back into *Cladonia*, but the squamule-free and completely decorticate, much-branched thallus are too consistent and morphologically foundational to ignore its generic distinction. For an alternative view one may wish to consult Stenroos *et al.* (2002), who admit that, in spite of their cladistic work, the placement of *Cladina* remains unsolved. ~ Thallus fruticose, much branched, the podetia hollow, ecorticate, often pycnidiate distally; squamules absent; apothecia very rare, the spores 8, hyaline, simple.]

1. Podetia white, usnic acid absent, K+ yellow. . . . . C. RANGIFERINA
1. Podetia yellow green or grayish, usnic acid present, K–.
   2. Fumarprotocetraric acid absent (P–). . . . . C. MITIS
   2. Fumarprotocetraric acid present (P+ red).
      Ultimate branches with a strong tendency to be swept in one direction. . . . . C. ARBUSCULA
      Ultimate branches not notably oriented in one direction.. . . . . C. SUBTENUIS

Cladina arbuscula (Wallr.) Hale & Culb. (L. *arbuscula*, a small tree, from the many-branched thallus) = *Cladonia arbuscula* (Wallr.) Rabenh. Our only records for this species are from an open to partly shaded sandy savannas and pastures. [usnic acid, fumarprotocetraric acid]

Barry-MIN,MSC, Kalamazoo-MSC, Kankakee-MOR, LaSalle-MOR, Pulaski-MOR, White-FH

Cladina mitis (Sandst.) Hustich (L. *mitis*, harmless, without spines; probably from the softness of moistened thalli) = *Cladonia arbuscula* subsp. *mitis* (Sandst.) Ruoss. *Cladonia sylvatica* of Calkins. The Berrien County specimen was from soil in open sandy scrub at the Robinson Preserve, where it is common; the Porter County specimen was from sand prairie southwest of the visitor center

of the Indiana Dunes National Lakeshore, along the horse trail. [usnic acid, ± rangiformic acid]

Allegan-MSC, Berrien-MOR,MSC, Kalamazoo-MIN,MSC, LaSalle-NY, Porter-MIN

Cladina rangiferina (L.) Nyl. (L. *rangifer*, a reindeer + *-inus*, pertaining to; from the branched thallus reminiscent of reindeer) = *Cladonia rangiferina* (L.) F. H. Wigg. Our Porter County specimen was from behind the visitor center of the Indiana Dunes National Lakeshore. The Berrien and St. Joseph County, Indiana, specimens were from open sand scrub. Thomson (1943) reports it from Walworth County based upon a specimen collected in 1893. The Milwaukee County record is reported by Thomson (2003). ~ Tips of the branches K+ pale yellow. [atranorin, fumarprotocetraric acid]

Allegan-MSC, Barry-MSC, Berrien-MOR, Lake Il-MOR, Milwaukee, Porter-MIN, Pulaski-MOR, St. Joseph IN-MOR, Walworth-WIS

Cladina subtenuis (Abbayes) Hale & W. Culb. (L. *sub-* below, slightly, imperfectly, nearly; from its strong resemblance to *Cladina tenuis*) Probably = *Cladonia subtenuis* (Abbayes) Mattick, *Cladonia rangiferina* var. *sylvatica* of Calkins; note that Calkins did not mention any other *Cladina*. Locally, this species is rare on sandy open soil, or on eroded, well leached clayey till or loess, typically with other terricolous lichens and *Danthonia spicata*. The Rock County record is reported by Thomson (2003). [usnic acid, fumarprotocetraric acid]

Cook-MOR, DuPage-MOR, Jefferson, Kankakee-MOR, LaSalle-NY, Lee-MOR, Ogle-MOR, Porter-MOR, St Joseph-MOR, Will-MOR

CLADONIA P. Browne CLADONIACEAE [Photobiont: *Trebouxia*-like. Gr. *kladion*, a small branch; from shape of the podetia. ~ Thallus fruticose from primary squamules; podetia hollow, branched or unbranched, usually at least partly corticate, cupped or attenuate distally; apothecia distally disposed, often present; spores 8, hyaline, simple.]

1. Podetia much branched and elongated; basal squamules few or absent; apothecia absent.
   2. Podetia gray green, UV–, P+ red (fumarprotocetraric acid). . . . . C. FURCATA
   2. Podetia yellow green, UV+/–, P– or P+ yellow (usnic acid).
      Ends of the branches lustrous, obviously areolate; squamatic acid present.. . . . . C. UNCIALIS
      Branches more or less dull throughout, areoles obscure or absent; squamatic acid absent.. . . . . C. DIMORPHORCLADA
2. Podetia simple or only sparingly branched; basal squamules usually well developed; apothecia conspicuous.
   3. Squamatic, grayanic, or homosekikaic acids present; thallus UV+ bright white, at least on the ecorticate portions of the squamules and podetia.
      4. Thallus greenish or yellowish gray; squamule margins sorediate; usnic acid present. . . . C. INCRASSATA
      4. Thallus without greenish or yellowish tinctures; squamules esorediate; usnic acid absent.
         5. Squamatic acid absent.
            6. Homosekikaic acid present.
               Podetia slender, terminated by small cups; finely sorediate throughout.. . . . . C. REI
               Podetia short and stout, the cups deep and bowl-shaped; not finely sorediate throughout. .. . . . . C. HOMOSEKIKAICA
            6. Homosekikaic acid absent.
               Podetia slender, terminated by small cups; finely sorediate throughout.. . . C. CYLINDRICA

Podetia short and stout, the cups deep and bowl-shaped; not finely sorediate throughout. .. . . C. GRAYI

5. Squamatic acid present.
   7. Podetia esorediate, with or without squamules. . . . . C. CRISPATA
   7. Podetia sorediate, usually abundantly squamulose.
      8. Podetia with cups open to the hollow interior. . . . . C. CENOTEA
      8. Podetia without cups or with small cups not open to the interior.
         Squamatic acid only present. . . . . C. SQUAMOSA
         Squamatic acid with either baeomycesic acid and/or barbatic acids present. . . . . C. BEAUMONTII

3. Squamatic acid, grayanic, and homosekikaic acids all absent; thallus UV–.
   9. Podetia forming cups that flare distally, their diameter larger than that of the podetia, or if only equal to the podetia in diameter, the cup open to the hollow interior.
      10. Podetia and cups esorediate.
         11. Central portions of the cups proliferating, producing secondary and tertiary cups. . . . . C. VERTICILLATA
         11. Cups not proliferating, or proliferating from their margins only.
            12. Cups either with membranes irregularly perforated.. . . . . C. MULTIFORMIS
            12. Cups without perforations.
               13. Podetia short, gray green, the cups not or only rarely proliferating.. . . . C. PYXIDATA
               13. Podetia tall, olive green, with the cups usually proliferating at their margins.
                   Cortex dull, areolate distally, the podetia often nigrescent proximally. . . . . C. PHYLLOPHORA
                   Cortex shiny, not areolate, podetia not nigrescent proximally. . . . . C. GRACILIS TURBINATA
      10. Podetia and or cups nearly or quite covered by fine to coarse soredia.
         14. Podetia very elongate, terminated by small cups, finely sorediate, nearly or quite to the base. . . . . C. FIMBRIATA
         14. Podetia stout, the cups often deep and flaring, sometimes partly corticate.
            15. Apothecia and/or pycnidia red; thallus yellowish green; usnic acid present.
                Podetia finely sorediate, the larger more than 2.5 cm high. . . . . C. DEFORMIS
                Podetia granular sorediate, the larger less than 2.5 cm high.. . . . . C. PLEUROTA
            15. Apothecia and/or pycnidia brown or absent; thallus grayish or whitish; usnic acid absent.
               16. Cryptochlorophaeic or merochlorophaeic acid present; UV+ pale blue or yellow.
                   Cryptochlorophaeic acid present; UV+ pale yellowish. C. CRYPTOCHLOROPHAEA
                   Cryptochlorophaeic acid absent: UV+ pale blue.. . . . . C. MEROCHLOROPHAEA
               16. Cryptochlorophaeic acid and merochlorophaeic acid absent; UV–.
                  17. Thallus K+ yellow. . . . . C. DIGITATA
                  17. Thallus K–.
                      Soredia coarse and granular, extending below the flare of the cup; cups stout, not generally deep and expanded; bourgeanic acid absent. C. CHLOROPHAEA
                      Soredia fine, generally confined the region at or above flare of the cup; cups thin, deep and expanded; bourgeanic acid present.. . . . . C. CONISTA
   9. Podetia not forming cups, or podetia absent, or with very shallow cups no wider than the podetia.
      18. Apothecia red and/or pycnidia (rarely black); barbatic acid present.
         19. Podetia esorediate. . . . . C. CRISTATELLA
         19. Podetia at least partly sorediate.
             Squamules incised, esorediate; podetia scarcely sorediate, beset with granular or isidioid squamules except in ecorticate areas that turn brown and translucent. . . . . C. DIDYMA

Squamules occasionally lobed but not incised, sorediate; podetia with patches of fine soredia .. . . . . C. MACILENTA BACILLARIS

18. Apothecia tan or brown to nigrescent, or absent; barbatic acid absent, or if present in *C. robbinsii*, then the apothecia absent absent.
    20. Podetia and or squamules K+ yellow or yellow turning red (norstictic acid).
        21. Squamules K+ yellow turning red.
            Atranorin present. . . . . C. SYMPHYCARPA
            Atranorin absent. . . . . C. SUBCARIOSA
        21. Squamules K+ yellow, at least below (atranorin).
            22. Primary squamules commonly more than 3 mm long; podetia absent. . . . . C. APODOCARPA
            22. Primary squamules less than 3 mm long; podetia often present.
                Primary squamules, K+ yellow, strap-like, commonly 1 mm or more long, simple or lobulate. . . . . C. CARIOSA
                Primary squamules, K+ deep yellow, minute granular, similar those that densely clothe any developed podetia. . . . . C. PARASITICA
    20. Podetia K– and squamules K– or podetia absent or less than 4 mm long.
        23. Podetia absent of less than 4 mm long.
            24. Apothecia well-developed, sessile or on short slender podetia. . . . . C. CAESPITICIA
            24. Apothecia rare, the podetia minute and pointed or absent; squamules various.
                25. Squamules yellowish, C+ green, or C– and KC+ golden or yellow and with apothecia absent.
                    Squamules C+ green. . . . . C. STREPSILIS
                    Squamules C--. . . . . C. ROBBINSII
                25. Squamules without any tinctures of yellow, C– and KC–.
                    26. Larger squamules more than 2.5 mm or more long. . . . . C. SOBOLESCENS
                    26. All squamules less than 2 mm long.
                        Sphaerophorin present. . . . . C. PETROPHILA
                        Sphaerophorin absent. . . . . C. RAMULOSA
        23. Podetia manifest, 4 mm or more long.
            27. Podetia sorediate, at least above the middle.
                28. Podetia partly corticate at least near the base.
                    Primary squamules inconspicuous; podetia commonly more than 1.5 cm long . . . . . C. CORNUTA
                    Primary squamules well developed; podetia rarely more than 1.5 cm long. . . . . C. OCHROCHLORA
                28. Podetia wholly and evenly farinose-sorediate or minutely squamulose or isidiate.
                    Podetia granulose to minutely squamulose or isidiate; primary squamules scarcely discernable among the granules. . . . . C. RAMULOSA
                    Podetia throughout or sorediate or sorediate with ecorticate areas . . . . . C. CONIOCRAEA
            27. Podetia esorediate or largely so.
                29. Thallus yellowish green; usnic acid present. . . . . C. PIEDMONTENSIS
                29. Thallus grayish green or gray; usnic acid absent.
                    30. Podetia P+ yellow (psoromic acid). . . . . C. BREVIS
                    30. Podetia P + red (fumarprotocetraric acid)
                        Apothecia tan; squamules less than 1.5 mm long. . . . . C. PEZIZIFORMIS
                        Apothecia brown; many squamules more than 1.5 mm long. . . . . C. SOBOLESCENS

Cladonia apodocarpa Robbins (Gr. *a-*, without, absent, away + *podos*, foot + *karpos*, fruit; from the typically sessile apothecia) Our only record for this species is from a bluff top and the Seneca Hill Prairie. ~ Primary squamules well-developed; upper medulla K+ yellow. [fumarprotocetraric acid, atranorin]

LaSalle-MOR

Cladonia beaumontii (Tuck.) Vain. (In honor of J. F. Beaumont, 1825–1865,, of Alabama, who collected the type material) Most of our specimens are all from sandstone exposures or stable sandy open areas. The Kane County material was collected on a decorticate log in open woods. All of our specimens, like so much Midwestern material, contain what appears to be barbatic acid rather than baeomycesic acid, and perhaps should be treated as a chemical race of *C. squamosa*. Frankly the morphological differences, as articulated in the literature are difficult in which to find consistent strength of identity among these two taxa. Dick Harris (personal communication) calls all the squamatic acid specimens with either barbatic or baeomycesic acids in the Missouri Ozarks *C. beaumontii*. It would seem to us that this complex could use some serious evaluation. ~ Primary squamules usually well-developed; podetia usually quite squamulose, UV+ bright white [squamatic acid, baeomycesic acid, or barbatic]

Berrien-MOR, Jasper-MOR, Kane-MOR, Ogle-MOR

Cladonia brevis (Sandst.) Sandst. (L. brevis, short; from the podetia, which are shorter than those of *C. peziziformis*) Our only records are from Allegan and Barry counties. ~ Primary squamules well-developed; podetia smooth, rather stout not seemingly contorted; apothecia brown, about as broad as the podetia; K– or K+ pale yellow. [psoromic acid]

Allegan-MSC, Barry-MSC

Cladonia caespiticia (Pers.) Flörke (L. *caespiticius*, forming a turf; from the turf-like development of the squamules) The substrate is quite variable, though this species is most often found at the bases of *Quercus velutina* or *Q. palustris*. There is a specimen from the base of *Tsuga canadensis*, one from HCl+ rock, one from a decorticate log, and one from shaded stable sands along the foredunes at Indiana Dunes State Park. Fink's Kane County specimen (ILL) is from an old cedar log in the *Thuja* swamp at Elgin.~ Primary squamules well-developed; podetia ecorticate, to 4 mm high, much narrower than and dwarfed by the yellowish to reddish-brown apothecia and scarcely corticate. [fumarprotocetraric acid]

Allegan-MIN, Berrien-MOR,MSC, Cook-MOR, DuPage-MOR, Jasper-MOR, Kane-ILL,NY,US, LaPorte-MOR, Newton-MOR, Ogle-MOR, Porter-MIN,MOR,MSC

Cladonia cariosa (Ach.) Spreng. (L. *cariosus*, much decayed; perhaps from the often nigrescent or brownish tinge of older, typically persistent squamules) = *C.* "*cariota*" of some authors. Rather frequent a little farther north, Calkins & Huett (1898) report this species from La Salle County; the only Illinois specimens we have seen are from southern Illinois. A strictly terricolous species, it is probable that this local report is based upon some other species. ~ Primary squamules well-developed, the ecorticate portions K+ yellow. [atranorin]

LaSalle

Cladonia cenotea (Ach.) Schaerer (Maya *cenote*, a deep well or sinkhole; an allusion to the deep hollow cups) Yet unknown from our region, this mostly northern species occurs as nearby as

Eaton County, Michigan. ~ Primary squamules absent or soon evanescent; podetia UV+ bright white. [squamatic acid]

Cladonia chlorophaea (Sommerf.) Spreng. (Gr. *chloros*, green, greenish yellow + *phaios*, dusky, dark, gray; from the greenish gray color of the podetia and squamules) Probably = *C. pyxidata* and *C. pyxidata* var. *pocillum* of Calkins. Including *C. chlorophaea* f. *carpophora* (Flörke) Anders.; *C. chlorophaea* f. *simplex* (Hoffm.) Arnold. Usually, this species grows on weathered clayey till or spoil, or weathered sandy fields, sand prairies, and black oak savannas. It is occasional at the bases of trees, particularly *Quercus*, but there are also specimens from burnt wood, decorticate logs, and stumps, and even pyrite. It is far more frequent in our western sector than *C. grayi*. A Calkins specimen from Cook County (#1891 NY) was originally named *C. fimbriata simplex.* Note that Calkins did not mention this species and, of course, was unaware of the importance of secondary metabolites in species segregation. ~ Thallus UV–; primary squamules well-developed, divided or lobulate; podetia with broadly expanded sorediate cups. [fumarprotocetraric acid]

Allegan-ASU,BYU,MICH,MSC, Berrien-MOR, Cook-ILL,NY, DuPage-MOR, Grundy-MOR, Jasper-MOR, Kalamazoo-MSC, Kane-MOR, Kendall-MOR, LaGrange-MOR, Lake Il-MOR,NY, Lake In-MOR, LaSalle-MOR,NY, Lee-MOR, McHenry-ILL,MOR, Ogle-MOR, Porter-MOR, Racine-MOR, St.Joseph In-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR,WIS, Winnebago-MOR

Cladonia coniocraea (Flörke) Sprengel (Gr. *konios*, point, top + *craer*, dusty; perhaps from the sorediate podetia) Including *C. coniocraea* f. *ceratodes* (Flörke) Dalla Torre. *Cladonia coniocraea* is characteristic of corticate and decorticate logs in shaded woods, often with *C. macillenta bacillaris*, but it is occasional at the bases and along the lower trunks of trees, particularly *Quercus*. There is one specimen from a stable, partly shaded foredune at Indiana Dunes State Park. Herre (1934) reports it from LaPorte and Porter counties; Thomson (1942) reports it from Walworth County. Also included here are previous local reports for *C. subulata*. See also notes under *C. ochrochlora*. There is a possibility that our interpretation of this species is not congruent with that of Flörke or even other American authors. It is our opinion, for example, that the photograph in Brodo *et al.* (2001) said to be this species is *C. ochrochlora*; rarely do any of our specimens have primary squamules 2–5 mm long as presented in Hale (1979). Our specimens, whatever they are, have evenly sorediate, elongate conic to slender podetia, and fumarprotocetraric acid. ~ Primary squamules persistent, often divided; podetia sorediate throughout, pointed, usually without squamules. [fumarprotocetraric acid]

Berrien-MOR, Cook-MOR, DuPage-MOR, Ford-MOR, Kane-MOR, Kendall-MOR, LaGrange-MOR, Lake In-MOR, LaSalle-MOR, Livingston-MOR, Newton-MOR, Porter-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Cladonia conista (Nyl.) Robbins (?L. *con*, together, with + *iste*, that one near at hand; the allusion not evident if I have the word broken down properly) Including *C. humilis* (With.) J. R. Laundon (L. *humilis*, small, dwarfish, on the ground; probably from its low habit); *C. conista* f. *simplex* Robbins. This species is infrequent with us, known from just a few sandy prairies and savannas. A Calkins specimen from Cook County (#1991) was originally called *C. fimbriata simplex.* Thomson (1942) reports it from Walworth County. According to Nash *et al.* (2002), this species is similar to *C. chlorophaea* and *C. fimbriata*, with which it could be confused if the fatty acid, bourgeanic acid, is overlooked. While some North American authors regard the two

elements to be conspecific, with *C. conista* being the older name, Raquel *et al.* (2012) believe that the two elements are distinct species and that most of the North American material is *C. conista*, a view elaborated upon by Raquel *et al.* (2013) who map at least one record of *C. humilis* for the Midwestern United States. The latter is the only species in the *C. chlorophaea* complex that produces atranorin in addition to fumarprotocetraric acid. The podetial cortex of *C. conista* is persistent, gray and smooth, and may continue past the flaring base of the relatively wide cup. Students north and east of our region may encounter *Cladonia carneola* (Fr.) Fr. (L. *caro*, meat or flesh, an allusion to the color of the apothecia) with is similar but is notably yellow-green and contains usnic acid and zeorin, which is evocative of the red-podetiate *Cladonia pleurota*, which see. ~ Podetia very similar to *C. chlorophaea*, but more evenly and finely sorediate, the cups deep and exapanded. [fumarprotocetraric acid, bourgeanic acid]

Allegan-ASU,BYU,MICH,MSC, Barry-MSC, Cook-MOR,NY, DuPage-MOR, Kane-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, Porter-US, Will-MOR

Cladonia cornuta (L.) Hoffm. (L. *cornuta*, a horned animal; an allusion to the horn-like appearance of the podetia) Yet unknown from our region, this mostly northern species occurs as nearby as Eaton County, Michigan. ~ Primary squamules small to evanescent; podetia tall and long-tapering, commonly more than 25 mm high, sorediate distally, largely corticate below the middle. [fumarprotocetraric acid]

Cladonia crispata (Ach.) Flotow (L. *crispare*, to curl) This species is rather frequent just north of our region, particularly in Michigan, but is yet unknown locally. ~ Primary squamules minute and lobulate; evocative of *Cladonia furcata*, the thallus with tinctures of brown or olive, UV+ bright white. [squamatic acid]

Cladonia cristatella Tuck. (L. *crista*, a crest + *tellus*, earth; from the soil-inhabiting, red-crested podetia, or perhaps from the diminutive of *cristatus*, crested) This is the common "British Soldiers" lichen. It grows on just about any substrate that will support *Cladonia*, though it is most frequent on decorticate logs and old wood; it is also frequent as a terricolous species in black oak savannas and in sandy prairies. Occasionally it is found on shingled roofs, fence posts, and even on weathered cinders along railroads. This species is characterized by red apothecia and non-sorediate corticate podetia; otherwise it varies markedly in squamule development on the podetia and the podetia rarely can be tan or orange. ~ Primary squamules well-developed and finely lobulate; podetia vary variable, from smooth and corticate to heavily squamulose. [barbatic acid, didymic acid, ± usnic acid]

Allegan-ASU,F,MICH,MSC, Berrien-MOR, Boone-MOR, Calhoun-MSC, Cass-MICH, Cook-MOR,NY, DuPage-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Kalamazoo-MSC, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, LaGrange-MOR, Lake Il-MOR,NY, Lake In-MOR, LaPorte-MOR, LaSalle-MOR,NY, Lee-MOR, Marshall-MOR, McHenry-ILL, Milwaukee-FH, Newton-MOR, Ogle-MOR, Ottawa-MSC, Porter-INDU,MOR, Pulaski-MOR, Racine-UWSP, St. Joseph In-MOR, Starke-MOR, Steuben-IU, Van Buren-FLAS, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Cladonia cryptochlorophaea Asah. (Gr. *kruptos,* hidden; from its hidden, chemical, distinction from *C. chlorophaea*) Thomson (1984) mapped this species from extreme southeastern Wisconsin. It grows in habitats similar to those of *C. chlorophaea*, though it is less common. A Calkins specimen from Cook County (#1991) was originally called *C. fimbriata simplex.* Wilcer (1984)

reports it from Starke County. ~ Similar to *C. chlorophaea*, but with the thallus UV+ pale yellowish. [cryptochlorophaeic acid, ± fumarprotocetraric acid, ± atranorin]

Allegan-MIN, Berrien-MOR, Boone-MOR, Calhoun-MSC, Cass-MICH, Cook-MOR,NY, DuPage-MOR, Jasper-MOR, Kankakee-MOR, Lake Il-MOR, LaPorte-MIN, LaSalle-MOR, Lee-MOR, Livingston-MOR, Newton-MOR, Ogle-MOR, Porter-MIN, Pulaski-MOR, Winnebago-MOR

Cladonia cylindrica (A. Evans) A. Evans (Gr. *kylindros*, a cylinder; from the somewhat cylindrical shape of the podetia) = *C. borbonica* (Del.) Nyl. f. *cylindrica* Evans. Except for one specimen that grew on humus over sand at Illinois Beach State Park, all Southern Lake Michigan region material is from shaded decorticate logs and old stumps. Calkins's specimens from Cook County (#1849 and #1991) were originally called *C. fimbriata simplex*. ~ Thallus UV+ white; primary squamules small, finely lobulate; podetia granular-sorediate, particularly proximally, often bluntly tipped, the apothecia very rare. [grayanic acid, fumarprotocetraric acid]

Cook-MOR,NY, DuPage-MOR, Lake Il-MOR, LaPorte-MOR,US, LaSalle-MOR,NY, Milwaukee-MOR, Newton-MOR, Porter-MOR, St. Joseph In-MOR, Will-MOR, Winnebago-MOR

Cladonia deformis () Yet unknown from our region, this mostly northern species occurs as nearby as Eaton County, Michigan. ~ Primary squamules minute to evanescent; podetia often 2.5 cm or more high, KC+ golden. [usnic acid, zeorin]

Cladonia didyma (Fée) Vain. (Gr. *didymos*, double, twofold; only Fée knows why he named it thus) Including *C. didyma* f. *subulata* Sandst.; *C. pulchella* Schwein. Infrequent locally, this species is confined to decorticate logs. ~ Primary squamules lobulate, commonly granular-sorediate; podetia slender, the apothecia red and commonly present. [barbatic acid, didymic acid]

Berrien-MOR, Cook-MOR, DuPage-MOR, LaPorte-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Walworth-US

Cladonia digitata (L.) Hoffm. (L. *digitatus*, with fingers or toes) Yet unknown locally, this species occurs as nearby as Ozaukee County, Wisconsin, where it grows on soil in an old quarry. ~ Primary squamules mostly more than 4 mm long, not much divided, often dilated distally; podetia with deep cups, farinose sorediate, K+ deep yellow. [thamnolic acid]

Cladonia dimorphoclada Robbins (Gr. *di*, twice + *morphe* + form or shape, *kladion*, a small branch) Our only records for this species are from our western sector, where it grows on shallow soil over partly shaded sandstone exposures with *Bouteloua curtipendula, Hedeoma hispida, Hypericum gentianoides, Ionactis linariifolia, Koeleria macrantha, Liatris aspera intermedia, Liatris cylindracea, Phemeranthus rugospermus, Schizachyrium scoparium*, and *Tephrosia virginiana*. Most Illinois material has podetia less than 3 mm in diameter, which could place them within *C. dimorphoclada* Robbins. Many of our specimens display a fine cloud of needle-like crystals at the distal portions of the podetia (triterpenes), a feature never supposed to occur in *C. uncialis*, which see. All local reports of *Cladonia caroliniana* Tuck. are referable here. ~ Primary squamules absent; podetia KC+ golden, much-branched, usually rather spreading-ascending [triterpenes, usnic acid]

Lee-MOR, Ogle-MOR

Cladonia fimbriata (L.) Fr. (L. *fimbriatus*, fibrous, fringed with hairs; from the fringed appearance of the evenly spaced podetia on decorticate logs) This species is occasional on weathered wood, decorticate logs and stumps, rare on weathered till. Calkins (1896) reports it from Will County. ~ Primary squamules lobulate, esorediate; podetia rather slender, with broadly

expanded cups, finely sorediate throughout. [fumarprotocetraric acid]

Cook-MOR, DeKalb-MOR, DuPage-MOR, Jasper-MOR, Kane-MOR, Kendall-MOR, Kenosha-MOR, Koskiusko-MOR, Lake Il-MOR, Lake In-INDU, LaSalle-MOR, Newton-MOR, Porter-MOR

Cladonia furcata (Huds.) Schrad. (L. *furcatus*, forked; from the branched podetia tips) Locally, weathered till in natural areas is the most common habitat, but there is one record from black oak savanna on sand, and another from high, stable mesophytic dune forest in Berrien County. The Waukesha County record is reported by Thomson (2003). ~ Primary squamules soon evanescent; podetia much branched, corticate, smooth or copiously beset with squamules. [fumarprotocetraric acid]

Barry-WIS, Berrien-MOR, Cass-MICH, Cook-MOR, DuPage-MOR, Jasper-MOR, Kane-MOR, Lake Il-MOR, LaSalle-MOR,NY, Livingston-MOR, McHenry-MOR, Ogle-MOR, Porter-MOR, Racine-MOR, St. Joseph In-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Cladonia gracilis (L.) Willd. ssp. **turbinata** (Ach.) Ahti (L. *gracilis*, slender, simple; from the slender podetia; L. *turbinatus*, cone- or top-shaped; from the shape of the podetia that typically flare distally) = *C. gracilis* of Calkins. It is likely that his report is referable to some other species. *C. gracilis* var. *verticillata* of Calkins may be referable here, because at least one specimen with that name, in his bound *Lichenes Exsiccati* at ILL, is this species. All the specimens we have seen locally are from stable sandy soil or sandstone outcrops. ~ Primary squamules usually well-developed; podetia rather slender, usually cup-forming, often proliferating from the cup margin. [fumarprotocetraric acid]

Cook-ILL, Ogle-MOR, Waukesha-MOR

Cladonia grayi Sandst. (after Rev. Fred Gray, of West Virginia, an amateur botanist) Including *C. grayi* f. *aberrans* Asah. Some of Calkins's reports of *C. pyxidata* may be referable here. This species is probably the commonest cup lichen in the eastern sector of our region, growing on weathered till, decorticate logs, tree bases, and in sandy prairies and savannas. Wilcer (1984) reports it from Starke County. [grayanic acid, ± fumarprotocetraric acid]

Allegan-MSC, Berrien-MOR, Cass-MICH, Cook-MOR, DuPage-MOR, Iroquois-MOR, Jasper-MOR, Kalamazoo-MSC, Kankakee-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR,US, LaSalle-MOR, Lee-MOR, Newton-MOR, Noble-NY, Ogle-MOR, Ottawa-MSC, Porter-INDU,MOR, Pulaski-MOR, St. Joseph IN-MOR, Starke-MOR, Walworth-US, Waukesha-MOR, White-FH, Will-MOR, Winnebago-MOR

Cladonia homosekikaica Nuno (A chemical species related to *C. pyxidata*, identified by the presence of homosekikaic acid) This species is confined to the antedunal lake plain prairies of Illinois Beach State Park, where even there it is rare. Elsewhere in North America there are records from Alaska, British Columbia, and Mexico. Stenroos *et al.* (2002) suggest that the *C. pyxidata* group is till in need of better understanding. [homosekikaic acid, atranorin, fumarprotocetraric acid]

Lake Il-MOR

Cladonia incrassata Flörke (L. *incrassatus*, thickened, stout; probably from the relatively thickened squamules) In the Southern Lake Michigan region, this species is confined to ombrotrophic bogs, where it grows at the bases of *Larix laricina* or on the old stumps. Thomson (1942) reports it from Walworth county. [squamatic acid, usnic acid, rhodocladonic acid]

Berrien-MOR, LaPorte-MOR

Cladonia macilenta Hoffm. var. **bacillaris** (Genth.) Schaer. (L. *baculus*, staff, rod + *-aris*, pertaining to; from the resemblance of the podetia to little rods) Including *C. bacillaris* f. *clavata* (Ach.) Vain. It is probable that Calkins's (1896) report of *C. macilenta* is referable here inasmuch as he did not list *C. bacillaris*, and noted that *C. macilenta* and *C. cristatella* were easily told by their scarlet apothecia. This species is characteristic of decorticate logs, stumps, and weathered farm wood, where it often covers large areas and sometimes, especially on corticate logs, grows with mosses such as *Platygyrium repens* and *Entodon seductrix*. Lichen associates often include *Cladonia coniocraea, C. cylindrica* and *C. cristatella*. There are also specimens from the bases of *Pinus*, *Prunus serotina*, and *Quercus velutina*. In our eastern sector, it sometimes grows on stable sandy soil, and there is one specimen from a shaded vertical sandstone cliff. Calkins & Huett (1898) reported *C. floerkeana* from La Salle County, and Mueller (1989) reported it from Lake County, Indiana; we are referring reports of that eastern species here pending examination of voucher material. Typical *C. macilenta* has thamnolic acid (K+ deep) yellow, which we have yet to discover locally. In rare specimens with usnic acid, if the pycnidia are absent this species would be difficult to separate from *Cladonia bacilliformis* (Nyl.) Glück (L. *baculus*, staff, rod + *forma*, shape, appearance; from the resemblance of the podetia to little rods), which was reported from the Indiana Dunes National Lakeshore (Wetmore 1988); that specimen, at MIN, appears to lack usnic acid. [barbatic acid, ± didymic, ± usnic]

Allegan-MSC, Barry-WIS, Berrien-MOR, Cook-MOR,NY,US, DuPage-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Kane-ILL,MOR, Kankakee-MOR, Lake Il-MOR, LaPorte-MOR, LaSalle-MOR,NY, Lee-MOR, Livingston-MOR, McHenry-ILL,MOR, Newton-MOR, Ogle-MOR, Ottawa-MSC, Porter-INDU,MOR, Racine-MOR, St. Joseph IN-MOR, Starke-MOR, Walworth-MOR,US, Will-MOR, Winnebago-MOR

Cladonia merochlorophaea Asah. (Gr. *meros*, a part of; a variant of *C. chlorophaea*) Our only record for this northern species is one collected at Mount Baldhead near Saugatuck. [merochlorophaeic acid, fumarprotcetraric acid.]

Allegan-MSC

Cladonia multiformis G. Merr. (L. *multus*, many + *forma*, shape, appearance) Our only records of this northern species are from weathered till, where it grows with *C. peziziformis*. [fumarprotocetraric acid]

DuPage-MOR, Will-MOR

Cladonia ochrochlora Flörke (Gr. *okhors,* pale yellow + *khloros,* green) Frequent on lignin, often in shaded, or most areas. There is a specimen from Cook County (Calkins #1897 NY) that Calkins labeled *C. fimbriata* var. *coniocraea* and indicated that it had grown on an exposed "cedar" root [probably *Thuja occidentalis*] near Glencoe. Most of our specimens are on decaying logs or stumps in woods, or at the bases of trees. Virtually none of our specimens display cups at the ends of the podetia. [fumarprotocetraric acid]

Cook-MOR,NY, DuPage-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Lake Il-MOR, LaPorte-MOR, LaSalle-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Porter-MOR, Will-MOR, Winnebago-MOR

Cladonia parasitica (Hoffm.) Hoffm. (Gr. *para*, beside, near + *sition*, grain, food; from its presumed habitat on its nutrient source) = *C. delicata* of Calkins, who noted that was "found near Elgin on old stumps, near Lemont, and elsewhere." [thamnolic acid, decarboxythamnolic acid]

Cook-NY, LaSalle-NY

Cladonia petrophila R. C. Harris (Gr. *petra,* a rock, particularly a rock ledge + *philos,* loving, having an affinity for; from its fidelity to rock substrates) Yet unknown from the Southern Lake Michigan region, this species is known from nearby Marshall County, Illinois, where it grows on shaded sandstone in a mesophytic ravine along Tomahawk Bluff. This species was called *C. subapodocarpa* by Hale (1979). ~ UV+ blue white [sphaerophorin, fumarprotocetraric acid, ± atranorin]

Cladonia peziziformis (With.) J. R. Laundon (L. *pezica*, a sessile mushroom + *forma*, shape, appearance; from the supposed mushroom-like appearance of the small, flesh-colored apothecia atop stipe-like podetia) = *C. capitata* (Michx.) Spreng.; *C. mitrula* Tuck. Including *C. mitrula* f. *squamulosa* G. Merr. With the possible exception of *C. subcariosa*, this species is the weediest of our *Cladoniae*. It is characteristic of weathered clay tills and bluffs, often along worn paths and compacted soils, particularly where *Danthonia spicata* grows. It also grows in sandy prairies and savannas, and we even have a specimen from an old rag. ~ Primary squamules well-developed; podetia verruculose, often seemingly twisted, the pale brown or tan apothecia clearly much broader than the podetia. [fumarprotocetraric acid]

Allegan-MSC, Berrien-MIN,MOR, Cook-MOR,NY, DuPage-MOR, Grundy-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-INDU,MOR, LaSalle-ILL,MOR,NY, Livingston-MOR, McHenry-ILL, Newton-MOR, Ogle-MOR, Porter-MOR, St. Joseph In-MOR, Walworth-US,WIS, Will-MOR, Winnebago-MOR

Cladonia phyllophora Hoffm. (Gr. *phyllos*, leaf + *phoros*, a bearing; probably from the scaly podetia) Our only contemporary records for this largely northern species are from DuPage County, where it was collected on partly shaded clayey soil. [fumarprotocetraric acid]

Barry-MICH,MSC, DuPage-MOR

Cladonia piedmontensis G. Merr. (of the Piedmont) Although we have a couple of specimens from weathered clay till, most of the Southern Lake Michigan region material comes from our eastern sector, where it grows in sandy prairies and black oak savannas. [usnic acid; the Will County specimen (Wilhelm & Wetstein #20353 MOR) contains fumarprotocetraric acid, as do a couple of specimens from the Florida panhandle]

Berrien-MOR, Cass-MICH, Cook-MOR, DuPage-MOR, LaSalle-MOR, Newton-MOR, Ogle-MOR, Porter-MOR, St. Joseph In-MOR, Will-MOR

Cladonia pleurota (Flörke) Schaer. (Gr. *pleuron*, a rib, the side + *ota,* the ear; perhaps from the often imperfectly shaped cups evocative of the ear) Although we have a couple of specimens from weathered clay till, most of the Southern Lake Michigan region material comes from our eastern sector, where it grows in sandy prairies, black oak savannas, and even on long-stabilized sand in old sand pits and along road shoulders. One specimen is from a decorticate log. See also notes under *Cladonia conista*. ~ Primary squamules usually evident and well-developed; podetia to 2.5 cm high, granular-sorediate. [usnic acid, zeorin]

Berrien-MOR, Calhoun-MSC, Cook-MOR, DuPage-MOR, Kankakee-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Newton-MOR, Ogle-MOR, Porter-INDU,MOR,MIN, St. Joseph In-MOR

Cladonia pyxidata (L.) Hoffm. (L. *pyxidatus*, boxlike, cubical; presumably from the boxlike depressions formed by the cupped podetia) Thomson (1984) mapped this species from extreme southeastern Wisconsin. A rare species here, the Lake County, Illinois, specimen is from

weathered clay till on the south face of a pastured slope. The Lake County, Indiana, specimen was collected from "Miller Woods," where it no doubt grew in sandy black oak savanna. The Milwaukee County record is reported by Thomson (2003). [fumarprotocetraric acid]

Allegan-MIN,MICH,MSC, Barry-MSC, Berrien-BYU,MIN, Cook-ILL,F, Lake Il-MOR, Lake In-ILL,MOR, McHenry-ILL, Milwaukee, Porter-INDU,MIN, Waukesha-MOR

Cladonia ramulosa (With.) J. R. Laundon (L. *ramulus*, a little branch + *-osus*, denoting full of or prone toward; from the occasional small branchlets at the tips of the podetia) = *C. pityrea* (Flörke) Fr. Including *C. pityrea* var. *zwackhii* Vain. f. *squamulifera* Vain.; *C. pityrea* var. *zwackhii* f. *subacuta* Vain. Some recent authors have used the name *C. anomaea* (Ach.) Ahti & P. James. This species is characteristic of corticate and decorticate fallen logs in partly shaded areas, where it often grows with *C. bacillaris*. It also grows at the bases of trees in oak woodlands and occasionally on weathered wood. There is a common squamulose, epodetiate, fumarprotocetraric acid-producing species that occurs at the bases of trees throughout the Midwest; it may be referable here. [fumarprotocetraric acid]

Cook-MOR, DuPage-MOR, Jasper-MOR Jefferson-MO, Koskiusko-MOR, Lake Il-MOR, LaSalle-MOR, Livingston-MOR, Newton-MOR, Porter-MIN, Starke-MOR, Walworth-US,WIS, Waukesha-MOR, Will-MOR

Cladonia rei Schaer. (after Giovanni Re, 1773–1833, Italian botanist and physician) Skorepa's (1970) report of *C. decorticata* (Flörke) Spreng. [Skorepa & Vermoch #5225 (SIU)] is referable here. This species occupies a wide variety of substrates, in waste ground and in natural areas. It grows on such things as charcoal, burnt wood, corticate and decorticate logs, tree bases, humus, weathered till, sand, and spoil banks. [homosekikaic acid ± fumarprotocetraric acid]

Allegan-ASU,MSC, Berrien-MOR, Cass-MICH, Cook-MOR, DuPage-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake IL-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, McHenry-ILL,MOR, Newton-MOR, Ogle-MOR, Porter-INDU,MOR, Pulaski-MOR, St. Joseph In-MOR, Starke-MOR, Walworth-MOR, Will-MOR, Winnebago-MOR

Cladonia robbinsii A. Evans (after William Jacob Robbins, 1890–1978, American botanist) Infrequent, evidently confined to the moist stable sands of the antedunal region of Illinois Beach State Park, stable dunes and black oak savannas near Lake Michigan, and sandy soil generally in our western sector; the Lee County and Winnebago county records are from poor prairie on a gravel hill. [usnic acid, barbatic acid]

Allegan-MSC, Lake Il-MOR, LaSalle-MOR, Lee-MOR, Porter-MOR, Waukesha-MOR, Winnebago-MOR

Cladonia sobolescens (Nyl.) Vain. (L. *soboles*, sprout, shoot + *-escens*, beginning, becoming, slightly; from appearance of the podetia as sprouts) = *C. clavulifera* Vain. This species is occasional on disturbed but stable sands in power line rights-of-way and roadsides. Some authorities consider this element a mere chemical variant of *C. subcariosa*. [fumarprotocetraric acid]

Barry-MSC, DuPage-MOR, Kankakee-MOR, Porter-MOR, Pulaski-MOR, St. Joseph IN-MOR

Cladonia squamosa (Scop.) Hoffm. (L. *squamosus*, scaly; from the squamulose podetia) Calkins (1896) reported it from "earth and rotten logs in Will County and the western part of Cook." See also the comments under *C. beaumontii*. All of our Illinois specimens are from southern Illinois. There are extant populations in Ogle County, where it grows on both partly shaded lignin and sandstone. [squamatic acid]

Cook, Ogle-MOR, Will

Cladonia strepsilis (Ach.) Vain. (Gr. *strepsis*, a twist + *-ilis*, denoting a quality or capacity; from what aspect we have yet to imagine) Our only specimens are from stable sandy soil. [strepsilin, baeomycesic acid]

Lee-MOR, Ottawa-MSC, Porter-MIN,MOR

Cladonia subcariosa Nyl. (L. *sub-* below, slightly, imperfectly, nearly; from its resemblance to *P. cariosa*) = *C. polycarpoides* Nyl. Most local reports of *C. symphycarpa* probably should be referred here; it reacts K+ red, but also has atranorin. Though not quite as "weedy" as *C. peziziformis*, *C. subcariosa* is as widespread and will grow here on almost any terricolous substrate suitable for lichens. [norstictic acid]

Allegan-MSC, Berrien-MOR, Cook-MOR, DuPage-MOR, Iroquois-MOR, Kane-MOR, Kendall-MOR, Lake Il-MOR, Lake In-MOR, Laporte-MOR, LaSalle-MOR, Lee-MOR, Newton-MOR, Ogle-MOR, Porter-INDU,MOR, Rock-MOR, St. Joseph In-MOR, Starke-MOR, Walworth-MOR, Will-MOR, Winnebago-MOR

Cladonia symphycarpa (Ach.) Fr. (Gr. *symphyo*, to glue together + *karpos*, fruit; from the often united or coalesced apothecia atop a podetium) The few specimens we have are from sandy prairies, black oak savannas, a gravelly hill prairies. [atranorin, norstictic acid]

Allegan-MSC, Berrien-MOR, DuPage-MOR, Jasper-MOR, Kankakee-MOR, Livingston-MOR, McHenry-MOR, Porter-MOR

Cladonia uncialis (L.) F. H. Wigg. (L. *uncialis*, the twelfth part of anything; from what we have no idea) Calkins & Huett (1898) reported this species from La Salle County, and we have a modern record from Ogle County, where it grows in prairie at the mouth of Anne's Canyon, at Castle Rock State Park. According to Brodo (2016) this species may or may not posses squamatic acid; such specimens may be difficult to distinguish from *C. dimorphoclada*—see notes under *C. caroliniana*. *Cladonia uncialis* is said to have the inner podetial wall smooth, without striations; *C. dimorphorclada* has the inner walls marked by striations or cartilaginous thickenings. [squamatic acid, usnic acid]

Ogle-MOR

Cladonia verticillata (Hoffm.) Schaer. (L. *verticillatus*, whorled; presumably from the position of the apothecia along the rims of the flares at the tips of the podetia) = *C. gracilis* var. *verticillata* of Calkins; *C. cervicornis* (Ach.) Flot. ssp. *verticillata* (Hoffm.) Ahti. Some of our specimens are from weathered clayey till, often with *C. cristatella, C. peziziformis*, and *Danthonia spicata*; most are from sand prairies or black oak savannas, others from sandstone exposures, but one is from cinders in a railroad yard! [fumarprotocetraric acid]

Allegan-ASU,MSC,USU, Barry-MSC, Berrien-MOR,MSC, Cass-MICH,MSC, Cook-MOR, DuPage-MOR, Lake Il-MOR, Laporte -MOR, LaSalle-MOR, McHenry-ILL, Ogle-MOR, Porter-INDU,MIN,MOR, Pulaski-MOR, St. Joseph In-MOR, Will-ILL,MOR

CLADONIACEAE

A. Podetia with a fibrous, dull surface. . . . . **Cladonia**

A. Podetia with a corticate, smooth, lustrous surface.

Squamules well developed. . . . . **Cladonia**

Squamules reduced to crustose granules. . . . . **Pycnothelia**

COCCOCARPIACEAE

One local genus. . . . . **Spilonema**

COENOGONIACEAE

One local genus. . . . . **Coenogonium**

COENOGONIUM Ehrenb. COENOGONIACEAE [Photobiont: *Printzina*. Gr. *koinos,* shared, in common, + *gonio,* angle; perhaps from the tiny 2-celled spores. Asci *Catillaria*-type; spores 8, hyaline, 1-septate.]

1. Apothecia prevailingly more than 4 mm across, with distinct tinctures of yellow or pale brown. . . . . C. LUTEUM
1 Apothecia less than 0.4 mm across, very pale to nearly white. . . . . C. PINETI

Coenogonium luteum (Dicks.) Kalb & Lücking (L. *luteus*, saffron yellow or sallow; from the yellowish apothecia) More common farther south, this species is infrequent in districts north and south of our region. ~ Apothecia 0.4–2 mm in diameter, pale yellow; paraphyses 1.5–2.6 μm in diameter, the distal swellings to 4.5 μm; spores 7–11 μm × 2.5–3.5 μm.

Coenogonium pineti (Ach.) Lücking & Lumbsch (L. *pineti*, growing on pines) = *Dimerella pineti* (Ach.) Vězda This is a rare species in Illinois; our only local record is from a shaded, charred log, growing on moss, at the Danada Forest Preserve. ~ Apothecia 0.1–0.4 mm in diameter, generally concave; pale to albescent; paraphyses 1.0–2.0 μm in diameter, the distal swellings to 3.5 μm; spores 9–14 μm × 2.3–4.5 μm.

DuPage-MOR

COLLEMA F. H. Wigg. COLLEMATACEAE [Photobiont: *Nostoc.* Gr. *kollema*, that which is glued; from the gelatinous thallus. ~ Thallus gelatinous, brown to black, undifferentiated, flat throughout or pustulate, the larger lobes more than 4 mm wide; apothecia with a thalline margin, at least when young, the spores 8, hyaline, 3–14 septate, long-fusiform to bacilliform or acicular; hamathecium gelatinized; secondary metabolites absent.]

1. Apothecia abundant; isidia absent. . . . . C. NIGRESCENS
1. Apothecia rare; isidia present.
   2. Thallus saxicolous. . . . . C. FLACCIDUM
   2. Thallus corticolous.
      Lobe surfaces dull, subtly but distinctly pustular; spores 5–6 celled, 40–80 μm long, elongate fusiform. . . . . C. FURFURACEUM
      Lobe surfaces smooth and sublustrous; spores 3–5 celled, 26–45 μm long, short fusiform. . . . . C. SUBFLACCIDUM

Collema flaccidum (Ach.) Ach. (L. *flaccidus*, relaxed, flaccid; from the limber thallus) Our only record for this species is one known from Lee County, on an exposed limestone cliff in a pasture off Grand Detour Road. See comments under *C. subflaccidum.* ~ Isidia flattened, subsquamulose; spores 3–5 septate, not constricted at the septa, 25–35 μm × 6.0–6.5 μm.

Lee-MOR

Collema furfuraceum (Arnold) Du Rietz (L. *furfur*, bran + *-aceus*, of or pertaining to; perhaps from the scaly appearance of the dried thallus) Yet unknown from the Southern Lake Michigan region, it has been collected from nearby Montgomery County, Indiana, where it grew on *Carya cordiformis*. Farther south in Illinois it is frequent on partly shaded oak trunks. ~ Isidia globular to terete-elongate, often branching in age; spores 4–5 septate, often curved, 40–80 μm × 3.0–7.0 μm.

Collema nigrescens (Huds.) DC. (L. *nigrescens*, blackening; from the dark thallus) Calkins & Huett (1898) reported this species from "elms and limestones" in La Salle County. ~ Isidia globular to oblong or flattened; spores 5–12 septate, often curved, 50–100 μm × 3.0–4.5 μm.

LaSalle

Collema subflaccidum Degel. (L. *sub-* below, slightly, imperfectly, nearly; from its close relationship to *C. flaccidum*) Calkins (1896) reported "*C. flaccidum*" from oaks and elms, and stated that it was rare locally. He noted also that *C. flaccidum* grew on rocks, but such reports are best referred to *C. flaccidum*, which see. In Calkins's bound volumes of *Lichenes Exsiccati*, a specimen from La Salle County labeled *C. flaccidum* is referable here. ~ Isidia globular; spores 5–7 septate, 42–65 μm × 4.0–6.5 μm.

Cook, LaSalle-ILL, Will

COLLEMATACEAE

A. Cortex present, the thallus with a layer of more or less isodiametric cortical cells; upper surfaces usually smooth to sub-lustrous, slate gray to brown.
  Thallus lobes less than 2.5 mm across, gray or brown. . . . . **Scytinium**
  Thallus lobes broader, gray. . . . . **Leptogium**

A. Cortex absent, the thallus lacking an organized cortex, the hyphae interwoven; upper surfaces dull, usually olivaceous to black.
  B.` Thallus minutely fruticose, the lobes terete, appressed to erect and irregularly branched; apothecia rare, the spores simple. . . . . **Lempholemma**
  B. Thallus subfoliose to foliose, the lobes not terete and branched; apothecia rare or common; spores septate to muriform.
    C. Thallus lobes large, flat, neither thickened nor wrinkled, the larger more than 4 mm long; spores septate, more than 4.5 times as long as wide. . . . . **Collema**
    C. Thallus lobes small, thickened, wrinkled, or, warty isidiate, usually less than 4 mm long; spores septate to muriform, less than 4.5 times as long as wide.
      Apothecia rare or infrequent on the thallus. . . . . **Lathagrium**
      Apothecia usually present and frequent on the thallus. . . . . **Enchylium**

CONIOCYBACEAE

1. Thallus bright yellow, leprose; spores smooth, brownish. . . . . **Chaenotheca**
1. Thallus neither leprose nor bright yellow; spores often warty, hyaline. . . . . **Sclerophora**

CONOTREMA Tuck. STICTIDACEAE [Photobiont: *Trebouxia* or absent. Gr. *konos*, a cone + *trema*, a hole, especially the female pudendum; from the concave, immersed apothecia. ~ Thallus crustose, corticolous, continuous to rimose; apothecia immersed in a pit in the thallus; spores large, acicular, vermiform, 8,

hyaline, more than 25-septate.]

Conotrema urceolatum (Ach.) Tuck. (L. *urceolus*, a pitcher + *-atus*, adjective ending; from the appearance of the apothecium) = *Stictis urceolatum* (Ach.) Gilenstam, which is probably the better name for whatever this Stictidaceous thing is. Calkins (1896) stated that this species was found on "maples and poplars in Cook and Will counties," And we have an old specimen (Calkins *s.n.* MOR) from LaSalle County. Farther east, this species forms characteristic white patches on *Acer saccharum* in old growth forests (Wong & Brodo, 1992). The few specimens we have seen near our region appear to be non-lichenized. The DuPage County record is contemporary, taken from *Acer saccharum*. The reader may wish to consult Wedin *et al.* (2005). ~ Spores, constricted at the septa, 100–160 μm × 3.0–5.5 μm.

Cook, DuPage-MOR, LaSalle-ILL,MOR,NY, Will

CONSTRICTOLUMINA Lück., M. P. Nels. & Aptr. ARTHOPYRENIACEAE [Photobiont: *Trentepohlia* or absent. L. *constringere*, to draw together + *lumin*, light, or space through which light shines, such as the hyaline cells of the spores). ~ Thallus immersed; ostioles apical, solitary, spores typically 4–8, hyaline, 1-septate, more or less constricted at the septum.]

Constrictolumina cinchonae (Ach.) Lücking, M. P. Nelsen & Aptroot (from the host of the type collection, *Cinchona officinalis*) = *Arthopyrenia cinchonae* (Ach.) Müll. Arg. Our only record of this Southeastern species is based upon a specimen at US (#6623) that was said by Calkins, who collected it in 1890, to have grown in "Illinois, Kane County, Elgin." He had called it *Pyrenula glabrata.* This is otherwise a species of the southeastern states and the Atlantic coast up to New Jersey. One cannot help but suspect the validity of the label data. ~ Ascomata 0.4–0.6 mm in diameter; asci narrowly obovate, 90–125 μm × 17–22 μm, the spores with a well developed perispore, 20–30 μm × 7–11 μm.

Kane-US

CRESPOA (D. Hawksw.) Lendemer & Hodkinson PARMELIACEAE [Photobiont: *Trebouxia.* In honor of the Spanish lichenologist, Ana Crespo, 1948– , student of the lichens of the Mediterranean region. ~ Thallus foliose, gray to blue-gray above, the upper cortex notably reticulate-foveolate, the lobes finely white-reticulate distally, the lower cortex rhizinate, dark, paler at the margins; spores 8, hyaline, simple.]

Crespoa crozalsiana (Harm.) Lendemer & Hodkinson (in honor of the French mycologist, André de Crozals, 1861–1932) = *Canoparmelia crozalsiana* (Harm.) Elix & Hale; *Pseudoparmelia crozalsiana* (Harm.) Hale. Frequent in southern Illinois, our only northern records is from the bark of *Crataegus mollis* and *Gleditsia triacanthos*. ~ Medulla K+ deep yellow. [stictic acid]

DuPage-MOR, Fulton-MOR, White-MOR

CRYPTOTHELE Th. Fr. LICHINACEAE [Photobiont: Cyanobacterial with a reddish sheath. Gr. *kryptos*, hidden, secret + *thele*, nipple. ~ Thallus crustose, perithecia with pseudoparaphyses; spores 8, hyaline, simple.]

Cryptothele permiscens (Nyl.) Th. Fr. (L. *permisceo*, to mix up or throw into confusion—an easy condition to occupy when studying the Lichinaceae) Our only record for this species locally is from a specimen collected on "calcareous and arenaceous rock" in LaSalle County (Calkins #67, WIS). Evidently this is the lichen that was called "*Pyrenopsis phylliscina* Tuck." by Fink (1935). Calkins himself used the name "*Pannaria nigra*," a name which he has also used locally for *Placynthium nigrum* and *Rhizocarpon reductum*. Aino Hensson annotated the specimen in 1963, but demurred on a specific epithet. See also comments under *Pyronopsis fuscoatra*. ~ Spores 9–18 μm × 5–8 μm.

LaSalle-MOR

CYPHELIUM Ach. CALICIACEAE [Photobiont: *Trebouxia.* Possibly from Gr. *kypellon*, beaker, goblet, or perhaps *kyphella,* the hollow of the ears; from its hymenium sunken into the warty thallus, resembling a cup; we wonder if it should be spelled with two l's? ~ Thallus crustose, yellowish green, corticolous; apothecia black, more or less immersed, mazaedial, the spores numerous, brown, 1-septate; conidia ellipsoid.]

Cyphelium tigillare (Ach.) Ach. (L. *tigillaris*, pertaining to a bit or tuft of wool; probably from the fact that the warts appear to be stuffed with soot or wool) This species is occasional on old fence posts and rails, but we have one specimen from a decorticate stump of *Larix laricina,* one from the bark of *Prunus serotina*, and another from *Gleditsia triacanthos*. ~ Spores broadly ellipsoid, constricted at the septum, 17–21 μm × 9–11 μm. [rhizocarpic acid, epanorin, + two unknowns]

Cook-F,MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Jasper-MOR, Jefferson-WIS, Kane-MOR, Kendall-MOR, Kenosha-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Newton-MOR, Ogle-MOR, Porter-MOR, St. Joseph In-MOR, Waukesha-WIS, White-MOR, Will-MOR, Winnebago-MOR

CYSTOCOLEUS Thwaites. CYSTOCOLEACEAE [Photobiont: *Trentepohlia*. Gr. *cystos*, bladder, sac + *coleos*, sheath, regarding the sheath of fungal hyphae around the photobiont cells. ~ Thallus in minutely thread-like fruticose or filamentous wefts or mats, black or blue-black, the hyphae irregularly disposed around the algal filaments.

Cystocoleus ebeneus (Dillwyn) Thwaites. (Gr. *ebenos*, with the color of ebony) This rather rare species is known from Portland Arch in nearby Fountain County, where it grew on an exposed sandstone cliff face along Bear Creek. ~ In general aspect this species resembles *Racodium rupestre*, but the hyphal cells are irregularly disposed around the photobiont and somewhat knobby.

CYSTOCOLEACEAE

One local genus. . . . . **Cystocoleus**

DECAMPIACEAE

One local genus. . . . . **Eopyrenula**

DENDRISCOCAULON Nyl. LOBARIACEAE [Photobiont: *Scytonema* or *Nostoc*. Gr. *dendrisco*, tree-like + L. *caulis*, stem; from the densely branched suffruticose habit. ~ Thallus tiny, suffruticose, coralloid-branched, grayish or brownish, the sterile, the branches pubescent, muscicolous, terricolous, or lichenicolous; medulla present, white.

Dendriscocaulon intricatulum (Nyl.) Henssen. (L. *intricatus*, entangled + *ulus*, diminutive; the little entangled one) Our only record for this species is based upon a specimen collected by Calkins (F) in "Illinois", which probably means either Cook or, more likely, LaSalle County; it was collected "on wood." Labeled initially "*Leptogium bolacinum*", Sierk annotated it *Dendriscocaulon umhausense* in 1963, which determination was seconded by Buschbom in 2000. Most contemporary authors consider North American material *D. intricatulum.*

DERMATOCARPON Eschw. VERRUCARIACEAE [Photobiont: *Trebouxia*, with *Protococcus, Stichococcus,* and *Hyalococcus.* Gr. *dermatos*, of skin or leather + *karpos*, fruit; from the leathery-looking thallus with its inspersed perithecia. For good illustrations of the various diagnostic features in our Dermatocarpons see Amtoft al. (2008) ~ Thallus umbilicate to subfoliose or squamulose; rizines usually absent; perithecia immersed, the hamathecium gelatinous; spores 8, hyaline, simple; pycnidia immersed.]

1. Thallus on HCl– rock.
   2. Spores mostly more than 15 μm long. . . . . D. LURIDUM
   2. Spores to 15 μm long.

      Lower cortex yellow-gold and foveolate reticulate, the lobes generally attached by more than 1 holdfast perithecia rarely more than 0.3 μm . . . . . D. ARENOSAXI

      Lower cortex with various tinctures of brown, but not regularly yellow-gold and foveolate reticulate, the thallus units umbilicate, with a single holdfast; perithecia more than 0.3 μm across. . . D. MUHLENBERGII
1. Thallus on HCl+ rock.
   3. Thallus lobes nearly all less than 1 cm across, the margins with a well defined, black, raised margin; thallus lobes commonly with more than one holdfast; lower cortex usually smooth and tan. . . . . D. MULTIFOLIUM
   3. Thallus lobes variously sized, but the margins, though sometimes dark, not distinctly raised and well defined, or if so then the some of the lobes more than 1 cm long or across; principal thallus units with a single holdfast; lower cortex various.

      Thallus brittle, distinctly chocolate brown, at least in the non-pruinose margins; perithecia wholly contained within the medulla, not producing bulges on the lower cortex, the ostioles of black; lower cortex regularly foveolate-ridged or verrucose. . . . . D. DOLOMITICUM

Thallus leathery, pale brown to silvery gray; ostioles of perithecia brown, at least in part; perithecia, being rather large, with a tendency to push out bulges on the lower cortex, the ostioles brown, at least in part; lower cortex various but often smooth and not usually foveolate. . . . . D. MUHLENBERGII

Dermatocarpon arenosaxi Amtoft (L. *arena*, sand + *saxum*, rock, from it regular occurrence on sandstone) Yet unknown from our region, this species is known from districts all around us, where it grows on HCl– rocks. ~ Perithecia 0.2–0.3 mm across; spores 8.0–15.0 μm × 5.0–10.5 μm.

Dermatocarpon dolomiticum Amtoft (NL. *dolomiticus*, an unambiguous allusion to its carbonate-rich substrate, the word originally from the French geologist, Déodat de Dolomieu ,1750–1891, who discovered this form of limestone) Our only records are from dolomite prairies in Boone and Will County, where it grows fully exposed to the sun. ~ Perithecia 0.13–0.33 mm across, the ostiole usually sunken to flush with the upper cortex; spores 12–13 μm × 4.5–7.0 μm.

Boone-MOR, Will-MOR

Dermatocarpon luridum (With.) Laundon (L. *luridus*, pale green, the color of bruises; from its tendency to appear green rather than gray when saturate) Wide-spread in North America on acidic rock, there is a record from sandstone at Matthiessen State Park in LaSalle County. ~ Perithecia 0.25–0.45, typically extending sufficiently in the thallus to form bulges on the lower cortex, immersed or flush with the upper cortex; spores 15–19 μm × 4.0–7.0 μm.

LaSalle-WIS

Dermatocarpon muhlenbergii (Ach.) Müll. Arg. (in honor of Gotthilf Henry Ernest Mühlenberg, American botanist and clergyman) = *Bachmanianum miniatum, Endocarpon miniatum*, including *E. m.* var. *complicatum* and *E. m.* var. *muhlenbergii* of Calkins. This species is occasional on exposed or shaded basalt, sandstone, or dolomite, often in canyons or on rocky cobbles in woodland streams. Until specimens are discovered, it is presumed that the records of *D. miniatum* reported from Jasper County by Herre (1943) and Harris (1988) are referable here. See also the notes under *Toninia tecta*. ~ Thallus umbilicate, with a single central holdfast; perithecia 0.35–0.6.9 mm across, the ostiole usually raised above the upper cortex and extending sufficiently in the thallus to form bulges on the lower cortex; spores prevailingly 12–15 μm × 5.0–7.0 μm.

Boone-MOR, Cook-MOR, DuPage-MOR, Grundy-MOR, Kankakee-MOR, Kendall-MOR, LaSalle-MOR, Lee-MOR, Ogle-MOR, Will-DUKE,ILL,MOR, Winnebago-MOR

Dermatocarpon multifolium Amtoft (L. *multa*, many + *folium*, leaf; an allusion to the clustered array of small squamules form a rosette or matt) This species is infrequent on dolomitic erratics, cliff faces, and HCl+ rocks, often where moist and usually partly shaded. ~ Thallus of serval small lobes with multiple holdfasts, margins discretely nigrescent and raised; perithecia 0.25–0.5 mm across, the ostiole usually raised above the upper cortex; spores prevailingly 9.7–14 μm × 4.5–6.0 μm.

Boone-MOR, Kane-MOR, Kendall-MOR, LaSalle-MOR, Will-MOR, Winnebago-MOR

DIDYMOSPHAERIA Fuckel DIDYMOSPHAERIACEAE [Photobiont: absent.

Gr. *didymos*, double, twofold+ *sphaera*, ball or globe; probably from the constricted septate spores of some species. ~ Thallus endophloedeal; cells of the perithecial walls not isodiametric; hamathecium much anastomosing beyond the asci; asci IKI–; spores ellipsoid to fusiform in a single series in the ascus, 8, brown, 1-septate with subequal cells.]

Didymosphaeria oblitescens (Berk. & Broome) Sacc. (L. *oblitero*, blot out + *-escens*, becoming; disappearing) Our only records are from the bark of *Carya ovata* and *Populus tremuloides* in our northwestern sector. ~ Spores ellipsoid, brown, not constricted at the septum, 13–19 μm × 5–7 μm.

Rock-MOR, Winnebago-MOR

DIDYMOSPHAERIACEAE

One local genus. . . . . **Didymosphaeria**

DIMELAENA Norman CALICIACEAE [Photobiont: *Trebouxia.* Gr. *di-*, two, double + *melaina*, black; probably from the presence of black apothecia and a black margin on the squamules. ~ Thallus crustose, yellow-green, saxicolous, rimose to lobulate; apothecia immersed; spores 8, brown, 1-septate; conidia bacilliform.]

Dimelaena oreina (Ach.) Norman (Gr. *oreinos*, hilly, mountainous; perhaps from its frequency in rocky, hilly areas) Hale (1952) mapped a P–, C– record for extreme southeastern Wisconsin, though we have seen no supporting vouchers. Most of our specimens have gyrophoric acid and present at least weakly positive C reactions on the cortex. See also Hale (1979). Locally, it is infrequent on granitic boulders in pastures or prairie remnants, commonly with *Candelariella vitellina*. [usnic acid, ± gyrophoric acid]

Cook-MOR, Grundy-MOR, Kane-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Walworth-MOR, Will-MOR

DIPLOSCHISTES Norman THELOTREMATACEAE [Photobiont: *Trebouxia.* Gr. *diploos*, double + *schistos*, divided, cleft; from the muriform spores. ~ Thallus crustose, pale gray, continuous to rimose; spores 4–8, brown, muriform; conidia bacilliform.]

1. Thallus saxicolous; spores commonly more than 8 per ascus. . . . . D. SCRUPOSUS
1. Thallus terricolous, muscicolous, or lichenicolous; spores 4 per ascus. . . . . D. MUSCORUM

Diploschistes muscorum (Scop.) R. Sant. (L. *muscus,* moss; from its common inhabitancy over mosses) = *Urceolaria scruposa*, in part, of Calkins. This species is locally frequent on mosses and lichens over sand at Illinois Beach State Park and Sand Ridge Savanna. The Porter County material, evidently lumped with *Diploschistes scruposus* by Wetmore, was lichenicolous on *Cladonia,* growing in oak woodland at West Beach. Calkins (1896) described the habitat as

"calcareous earth" in Will County. The Berrien County specimen was on stabilized dunes at Warren Dunes State Park. In Cass County, it was rather frequent on mosses in a high-water-table flat of sand and gravel. A Calkins specimen from La Salle County was collected on the lignin of *Juniperus virginiana.* ~ Spores ellipsoid, 18–32 μm × 6–15 μm. [lecanoric acid, diploschistesic acids]

Berrien-MIN, Cass-MOR, Lake Il-MOR, LaSalle-F,ILL,MOR,NY, Ogle-MOR, Porter-INDU,MIN, Will-MOR

Diploschistes scruposus (Schreb.) Norman (L. *scruposus*, rough, stony; from its gray, unevenly wart-like thallus) This species is infrequent on sandstone exposures in our western sector. ~ Spores ellipsoid, 25–40 μm × 10–20 μm.

Lee-MOR, Ogle-MOR, Rock-WIS

DIPLOTOMMA (Hoffm.) Flotow CALICIACEAE [Photobiont: Chlorococcoid. Gr. *diploos*, two-fold + *omma*, eye. ~ Thallus crustose, continuous to rimose or subsquamulose, pale gray to grayish-brown, without diaspores; apothecia immersed to subsessile, lecideine; apothecial disk black, usually white pruinose, the hymenium not inspersed; spores 8, sordid to brown, submuriform.]

Diplotomma alboatrum (Hoffm.) Flotow (L. *albus*, white + *atrus*, black; perhaps from the white thallus in contrast to the black apothecia) Our only record for this species locally is from a specimen (Calkins #307, F) that may well have been collected locally or in nearby LaSalle County. The Barry County specimen was from a dead *Ulmus americana*. ~ Spores ellipsoid, 14–18 μm × 7–10 μm. [± connorstictic acid ± norstictic acid]

Barry-WIS, LaSalle-MOR

ENCHYLIUM (Ach.) Gray COLLEMATACEAE [Photobiont: *Nostoc.* Etymology known only to Acharius. ~ Thallus gelatinous, brown to black, undifferentiated, the lobes wrinkled or warty, the larger lobes less than 4 mm wide; apothecia with a thalline margin, at least when young, the spores 4–8, hyaline, septate to muriform, hamathecium gelatinized; secondary metabolites absent.]

1. Spores 4 per ascus, 3–7 septate, 0–3 muriform; lichen of leached clayey soils. . . . . E. LIMOSUM
1. Spores 8 per ascus, 1–5 septate, 0–2 muriform; lichens of carbonate-rich soils or rock, often among mosses.
   2. Thallus isidiate or warty-papillose; spores hyaline, 1 septate. . . . . E. CONGLOMERATUM
   2. Thallus generally without isidia or warty papules; spores usually 2 or more septate and often submuriform.
      3. Thallus on bare calcareous rock; spores simply 2–4 celled. . . . . E. POLYCARPON
      3. Thallus on rock among mosses; spores prevailingly sub muriform.
         Margins of apothecia and often the thallus lobes lobulate or verruculose; spores not constricted at the center septum. . . . . E. BACHMANIANUM
         Margins of the apothecia smooth and thallus without verrucae; spores usually constricted at the center septum. . . . . E. TENAX

Enchylium bachmanianum (Fink) Otálora, P. M. Jørg. & Wedin (in honor of the German medical practitioner and naturalist, Franz Ewald Theodor Bachmann, 1850–1937, who, as it were, spelled his name with 2 n's!) = *Collema bachmanianum* Fink. Our only records are from the vertical faces of dolomitic canyons. ~ Spores 8, ellipsoid, becoming pale brown, 4–5 septate, not constricted at the septa, acute to obtuse, sub muriform, 24–34 μm × 8.5–15 μm.

Cook-MOR, DuPage-MOR, Kankakee-MOR, LaSalle-MOR, Winnebago-MOR

Enchylium conglomeratum (Hoffm.) Otálora, P. M. Jørg. & Wedin (L. *con-*, with + *glomeratus*, wound up; from the appearance of the apothecia all wound up together) = *Collema conglomeratum* Hoffm.; *C. pycnocarpum* of Calkins (1896), who noted it from "elms and shrubs in Will County," and regarded it as rare. ~ Spores 8, fusiform, acute, hyaline, 1-septate, not usually constricted at the septa, acute to obtuse, 9–25 μm × 3–6 μm.

LaSalle-ILL, Will

Enchylium limosum (Ach.) Otálora, P. M. Jørg. & Wedin (L. *limosus*, full of mud, slime; from the dark wet thallus) = *Collema limosum* (Ach.) Ach. Calkins (1896) reported this species as rare on clay soil in Will County. Our only contemporary record is from a sand prairie near Beloit, where vascular plant associates included *Artemisia campestris caudata, Minuartia michauxii,* and *Schizachyrium scoparium*. ~ Thallus with a strong tendency to be quite thin an membranaceous between the apothecia; spores 4, ellipsoid to ovoid, 3–7 septate transversely, 0–3 septate longitudinally, 24–35 μm × 9–16 μm.

Rock-MOR, Will

Enchylium polycarpon (Hoffm.) Otálora, P. M. Jørg. & Wedin (Gr. *poly*, many + *karpos*, fruit; from the numerous apothecia) = *Collema polycarpon* Hoffm. Our only records for this species is from sandstone breaks on the DuPage River. ~ Thallus foliose, with radiate lobes to 2.5 mm broad, commonly lobulate; spores 8, fusiform, hyaline, mostly 3-septate, 15–30 μm × 6.0–8.5 μm.

Will-MOR

Enchylium tenax (Ach.) Otálora, P. M. Jørg. & Wedin (L. *tenera*, to hold or grasp; evidently from its proclivity for attachment to mosses) Yet unknown from the Southern Lake Michigan Region, this species grows in districts ambient to us, where it clings to mosses that grown on carbonate-rich rock. ~ Thallus subcrustose to foliose, notably swollen when wet; spores 8, hyaline, straight, fusiform to ovoid, mostly 3-septate, more or less constricted at the septa, submuriform, 17–27 μm × 8.5–11 μm.

ENDOCARPON Hedwig VERRUCARIACEAE [Photobiont: *Stichococcus.* Gr. *endon*, within, inside + *karpos*, fruit; from the immersed perithecia. "*Like Endocarpon the genus Staurothele is characterized by the presence of algal cells within the fruiting bodies. These algal cells are small (<7 mm) and either cube- or rod-like, whereas algal cells from the thallus are larger (usually >10 mm) and spherical*." (Thüs *et al.* 2011) ~ Thallus squamulose, brown to grayish; perithecium with tiny photobiont cells in the gelatinous hamathecium; spores muriform, 2, hyaline to tardily brownish]

1. Thallus prevailingly of aggregate areoles, often somewhat lobed with or without overlapping lobules; lower surface black.. . . . . E. PALLIDULUM
1. Thallus largely of dispersed or scarcely aggregated areoles, the margins neither lobulate nor overlapping, the lower surface pale. . . . . E. PETROLEPIDEUM

Endocarpon pallidulum (Nyl.) Nyl. (L. *pallida,* pale + *-ulus*, diminutive; presumably from the tiny squamules) Much less frequent than the following species, and most commonly on weathered carbonate or siliceous rock. ~ Spores 25–35 μm, or even longer × 11–13 μm.

Boone-MOR, DuPage-MOR

Endocarpon petrolepideum (Nyl.) Nyl. (Gr. *petros*, stone or rock + *lepidion*, diminutive for scale or flake; an allusion to the dispersed, scale-like areoles) Most previous local reports of *Endocarpon pusillum* Hedwig, including *E. pusillum* Hedwig var. *garovaglii* Kemp., as rendered by Fink (1900) or of *Bachmanianum pusillum* of Fink (1906), are referable here. This is a ubiquitous species, growing with *Myriolecis dispersa, M. hagenii, Verrucaria calkinsiana, V. nigrescens*, and *Xanthocarpia feracissima* on weathered concrete and flagstone. It also grows on gravel and on both granitic and dolomitic erratics, weathered bricks, mosses over dolomite, and even on weathered lignin and rusty metal. ~ Spores 25–35 μm, or even longer × 10–13 μm.

Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Kane-ILL-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR, Livingston-MOR, Newton-MOR, Ogle-MOR, Starke-MOR, Walworth-MOR, Will-MOR, Winnebago-MOR

EOPYRENULA R. C. Harris DECAMPIACEAE [Photobiont: *Trentepohlia.* Gr. *eos*, dawn, early; meaning a primitive or inchoate relative of the genus *Pyrenula*, which see. ~ Thallus crustose, endophloedeal, white; perithecia black, pale in the immersed portion, the spores 8, brown, 3–6 septate, the central cell the larger, constricted at the septa, microconidia elongate, hyaline, simple; macroconidia brown, septate.]

Eopyrenula intermedia Coppins (L. *inter,* between, among + *medius,* middle; from its equivalent similarities to two related species) Most commonly associated with *Acer saccharum*, and *Quercus alba,* the Cook County specimen was identified as *Pyrenula gemmata* by Calkins. See also *Anisomeridium biforme,* which has uniformly hyaline spores. ~ Spores fusiform, rather thick-walled, mostly 5-septate, not much constricted at the septa, 18–24 μm × 5–9 μm.

Cook-F

EVERNIA Ach. PARMELIACEAE [Photobiont: Chlorococcoid. Gr. *evernes*, sprouting well; probably from its often sumptuous, branched thalli. ~ Thallus yellow-green, fruticose, branched, with a cottony medulla, the branches flattened, pliable; spores small, 8, hyaline, simple.]

Evernia mesomorpha Nyl. (Gr. *mesos*, middle, intermediate + *morphe,* form, shape; perhaps

from a supposed appearance intermediate between related genera) Some of our material appears to be adventive in that it is found on planted trees, and commonly is represented only by tiny thalli. It grows commonly, however, on *Larix laricina* in Walworth County, and we have one specimen, possibly native, from *Juniperus horizontalis* at Illinois Beach State Park. [divaricatic acid, usnic acid]

Allegan-MSC, Barry-MICH,MSC,WIS, Berrien-DUKE, Cook-MOR, DuPage-MOR, Kalamazoo-MSC, Lake Il-MOR, McHenry-MOR, Milwaukee-MOR, Ottawa-MSC, Porter-MIN, Walworth-MOR, Waukesha-MOR,WIS, Will-MOR

FELLHANERA Vězda PILOCARPACEAE [Photobiont: Chlorococcoid. Vězda coined the name *Fellhanera* as an anagram of Hafellner. He wrote "*Anagramm zu Hafellner. Die Neue Gattung ist Herrn Dr. J. Hafellner gewidment in Anerkennung seiner Verdienste in der Systematik der Flecten*."~ Thallus crustose, usually foliicolous; apothecia dark, without a thalline margin; asci with and I+ apical dome; spores small, 8, hyaline, prevailingly1–3 septate; conidia asymmetrically short-fusiform.]

Fellhanera minnisinkorum R. C. Harris & Lendemer (in remembrance of the Minnisink people, a group of Native Americans whose territory included the type locality and surrounding Delaware Water Gap National Recreation Area) Our only record for this species is a specimen collected at Glencoe, Cook County, (Calkins #173) on a "clay bluff" in 1905. Calkins had named this specimen *Lecidea flavidolivens*. ~ Thallus sordid, isidioid-granular near the margin, commonly with a cottony hypothallus; apothecia brown, hypothecium brown, epithecium nearly hyaline; spores ca 17 μm long, 4.5 μm wide.

Cook-NY

FLAVOPARMELIA Hale PARMELIACEAE [Photobiont: *Trebouxia.* L. *flavus*, yellow; a yellow *Parmelia*, which see. ~ Thallus foliose, yellow-green, broad-lobed, the lower cortex black, but brown at the margins, rhizines simple; apthecia rare, lecanorine; spores 8, hyaline, simple; conidia tapered at both ends and in the middle.]

1. Thallus with finely granular soredia in rather evenly dispersed soralia. . . . . F. CAPERATA
1. Thallus with largely corticate, isidioid pustules, without finely granular soredia. . . . . F. BALTIMORENSIS

Flavoparmelia baltimorensis (Gyeln. & Fóriss) Hale (after Baltimore, Maryland) = *Pseudoparmelia baltimorensis* (Gyeln. & Fóriss) Hale**.** Southward this species is characteristic on exposed to partly shaded rocks, but our only local specimen is from an exposed sandstone break along the Rock River; it bears gyrophoric acid in the medulla. [protocetraric acid, ± gyrophoric acid]

Ogle-MOR

Flavoparmelia caperata (L.) Hale (L. *caperatus*, wrinkled, drawn into folds; probably from

the more or less wrinkled upper cortex) = *Parmelia caperata* (L.) Ach.; *Pseudoparmelia caperata* (L.) Hale. Although this species is nowhere near as common as it appears to have been in Calkins's day, it grows on a wide variety of corticolous substrates, including fallen logs and old stumps. It is most frequent locally on *Quercus alba* and *Q. velutina*, probably because these species are more likely to be found in open woods. As woods close in from fire suppression, most of our regional broad-lobed lichens disappear, so it is rare on *Q. rubra*, *Tilia americana*, and *Fraxinus americana*. We also have specimens from *Acer platanoides, Acer saccharum, Carya ovata*, *C. cordiformis*, *Q. palustris*, *Q. macrocarpa*, and *Populus deltoides*. It is much less common on granitic erratics, tombstones, and weathered wood. [protocetraric acid, usnic acid, caperatic acid, and atranorin]

Allegan-MOR,MSC, Barry-MOR,MSC, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MOR,MSC, Cass-MOR, Cook-ILL,MOR,NY, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kalamazoo-MSC, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR,MSC, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MIN, LaSalle-MOR,NY, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR,WIS, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MICH,MOR,MSC, Porter-MIN,MOR, Pulaski-MOR, Racine-MOR, Rock-MOR, St. Joseph IN-MOR, Starke-MOR,US, Steuben-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-ILL,MOR, Winnebago-MOR

FLAVOPLACA Arup, Søchting & Frödén TELOSCHISTACEAE [Photobiont: *Trebouxia*-like, mostly *"Pseudotrebouxia."* L. *flavus*, pale yellow + Gr. *plax*, a flat round plate, dish; a disconcerting mixture of Greek and Latin roots. ~ Thallus crustose, yellow, granular-sorediate, typically with some corticate areoles; spores not seen; anthraquinones.]

Flavoplaca citrina (Hoffm.) Arup, Frödén & Søchting (L. *citrinus*, lemon-colored; from the color of the soredia) = *Caloplaca citrina* (Hoffm.) Th. Fr. This species is typically found on dolomitic cliff faces, weathered quarry walls, and even concrete, usually in partly shaded situations. It is characterized by isidiate or sorediate granules scattered over the surface. Occasional forms in which corticate areolae are sorediate on the edges have been segregated as *Flavoplaca flavocitrina* (Nyl.) Arup, Frödén & Søchting.

Cook-MOR, DuPage-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kosciusko-MOR, LaSalle-MOR, Milwaukee-MOR, Ogle-MOR, Racine-MOR, Rock-WIS, Will-MOR, Winnebago-MOR

FLAVOPUNCTELIA (Krog) Hale PARMELIACEAE [Photobiont: *Trebouxia.* L. *flavus*, yellow; a yellow *Punctelia*, which see. ~ Thallus foliose; yellow green, the lower cortex brown to black; rhizines simple or forked; apothecia rare, lecanorine; spores 8, hyaline, 1-septate; conidia tapered in the middle and at both ends.]

1. Soredia coarse, subisidioid, in largely laminal soralia; thallus with white, conspicuous pores and maculae on the upper surface. . . . . F. FLAVENTIOR
1. Soredia in fine, marginal, crescent-shaped soralia; thallus without white pores, maculae infrequent on the upper

Flavopunctelia flaventior (Stirton) Hale (L. *flaventior*, yellower) = *Parmelia flaventior* Stirton; *P. andreana* Müll. Arg.; *Punctelia flaventior* (Stirton) Krog. This is a northern species that may have extended its range southward into the Midwest with the immense increase in corticolous substrate that has occurred since settlement. It is difficult to describe a habitat for it other than to note that it grows on trees in parks and pastures throughout the area. We have specimens fairly evenly distributed among the following trees: *Acer negundo, A. saccharinum, Fraxinus, Juglans nigra, Larix laricina, Quercus macrocarpa, Q. palustris, Q. Rubra, Q. velutina,* and *Salix* spp. It is infrequent on lignin. Both this species and the next commonly grow together, particularly on *Populus deltoides,* just north of our region. [lecanoric acid, usnic acid]

Allegan-MSC, Barry-MOR,MSC, Berrien-MOR, Boone-MOR, Calhoun-MSC, Cass-MSC, Cook-MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Jefferson-MOR, Kane-MOR, Kendall-MOR, Kenosha-MOR,WIS, Kent-MOR, Kosciusko-MOR, Lake Il-MOR, Lake In-MIN,MOR, LaSalle-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Porter-MIN,MOR, Racine-WIS, Steuben-MOR, St. Joseph IN-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR,WIS, Will-MOR, Winnebago-MOR

Flavopunctelia soredica (Nyl.) Hale (Gr. *soredion*, a little heap (soredium) L + *-icus*, belonging to, or emphasis on a certain character; from its production of soredia) = *Parmelia ulophyllodes* (Vain.) Sav.; *P. soredica* Nyl.; *Punctelia soredica* (Nyl.) Krog. This species appears to have an autecology similar to that of *F. flaventior*, though it is less frequent. We have specimens evenly distributed among the following species: *Acer rubrum, Acer saccharum, Carya cordiformis, Crataegus mollis, Fraxinus americana, F. lanceolata, Gleditsia triacanthos, Populus deltoides, Prunus americana, Quercus macrocarpa, Q. palustris, Q. rubra, Q. velutina*, *Salix nigra,* and weathered wood. [lecanoric acid, usnic acid]

Allegan-MOR, Barry-MOR,MSC, Benton-MOR, Cass-MOR, Cook-F,MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-WIS, Kane-MOR, Kent-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Laporte-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Ottawa-MOR,MSC, Racine-MOR, Steuben-MOR, St. Joseph In-MOR, Starke-MOR, Walworth-MOR,WIS, Waukesha-MOR, Will-MOR, Winnebago-MOR

FUSCIDEA V. Wirth & Vězda. FUSCIDEACEAE [Photobiont: chlorococcoid. L. *fuscus*, grayish brown + *-idea*, with the appearance or pattern; evidently an allusion to the gray-brown verrucae of the thallus. ~ Thallus crustose; apothecia sessile or more or less immersed, but often absent in our species; asci I+ blue distally; spores 8, hyaline, 0-1 septate; pycnidia immersed, the ellipsoid to bacilliform conidia. [divaricatic acid]

Fuscidea recensa (Stirton) Hertel, V. Wirth, & Vězda (L. *recensus*, reviewed, enumerated; perhaps from a reassessment of some *Lecidea* species by Stirton.) This species is known from nearby Warren County, Indiana, where it grows on sandstone at Fall Creek Gorge. ~ Thallus pale gray to brownish, the nigrescent apothecia epruinose; spores curved, 9–12 μm × 4–5 μm.

FUSCIDEACEAE

One local genus. . . . . **Fuscidea**

GRAPHIDACEAE

One local genus. . . . . **Graphis**

GRAPHIS Adans. GRAPHIDACEAE [Photobiont: *Printzina.* Gr. *graphis*, of line drawings; from the elongate, often branched apothecia that resemble written markings. ~ Thallus crustose, corticolous, endophloedeal, apothecia elongate or branched, carbonized, the paraphyses unbranched and notably aligned with each other, the distal cells much enlarged, the epithecium dark; hypothecium pale; spores 4–8, hyaline to brownish, 3-many septate with lenticular cells.]

1. Ascoma largely unbranched and vermiform, the rims remaining closed; pruina absent. . . . . G. LINEOLA
1. Ascoma simple or branched, linear to ovate, the rims soon relaxed to expose the epithecium; pruina scant to abundant. . . . . G. SCRIPTA

Graphis lineola Ach. (L. *linea*, line + *-olus*, diminutive) = *G. comma* Ach, of Calkins, which some authorities regard as a variant of *G. lineola*. R. C. Harris annotated a specimen (Calkins #195, NY) of this species which had been collected in 1900 on *Acer saccharum* at Glencoe, in Cook County. One might have suspected that the Calkins specimen was mislabeled except that we have seen similar specimens, one from *Acer saccharum*, another from *Carya ovata*, in natural landscapes in Lake County, Illinois. ~ Spores hyaline, 8–11 septate, 30–45 μm × 7–9 μm.

Berrien-MOR, Cook-NY, Lake Il-MOR

Graphis scripta (L.) Ach. (L. *scriptus*, written; from the appearance of the apothecia) According to Calkins, this species was common in the region, but it is now only occasional on the smooth plates of *Quercus* species, particularly in the red oak group, but there are also specimens from *Acer saccharum, Carya cordiformis, Carya ovata, Celtis occidentalis, Quercus alba, Quercus rubra, Quercus velutina*, and *Tilia americana*. Calkins's report of *Graphis (Phaeographis) dendritica* is almost certainly referable here inasmuch as specimens of his at the Field Museum and at the Chicago Academy of Sciences that he called *G. dendritica* are actually *G. scripta*. *G. scripta* is quite similar to *G. elegans,* except that the latter contains norstictic acid in the thallus and typically has furrowed apothecial margins; both species vary tremendously in their appearance, from small aster-like forms to simple or branched, or even long connecting semicircular lirellae. There is a *Phaeographis* specimen of Calkins's from Cook County at the New York Botanical Garden, but the associated species, *Graphina abaphoides,* on the same chink suggests that the specimen came from Florida. ~ Spores hyaline, 7–10 septate, 24–45 μm × 7–9 μm.

Allegan-MICH,MSC, Barry-MSC, Berrien-MOR, Calhoun-MSC, Cook-F,MOR,NY, DeKalb-MOR, DuPage-MOR, Ford-MOR, Jasper-MOR, Jefferson-MOR,WIS, Kane-MOR, Kendall-MOR, Kenosha-MOR, Kent-MSC, LaGrange-MOR, Lake Il -MOR, Laporte-MOR, LaSalle-MOR,NY, Lee-MOR, Livingston-MOR, McHenry-MOR,

Ogle-MOR, Porter-MOR, Racine-MOR, Walworth-MOR, Waukesha-MOR,WIS, Will-MOR, Winnebago-MOR

GYALOLECHIA A. Massal. TELOSCHISTACEAE [Photobiont: mostly *"Pseudotrebouxia."* Gr. *gyalo-*, brushed, polished, sanded + *lechos*, couch, bed, nest. ~ Thallus crustose, pale yellow, surficial; apothecia orange; spores polaribilocular, the isthmus more than a third of the length of the spore. Anthraquinones, particularly parietin. Occasional specimens of this genus have in their hymenia parasitic lichens with polysporous asci bearing brown, septate spores mostly 4–6 μm long. These may be *Muellerella lichenicola*, which see.]

1. Thallus corticolous.. . . . . G. FLAVORUBESCENS
1. Thallus saxicolous.
   2. Apothecia similarly colored throughout.
      3. Thallus more or less continuous, without a black hypothallus. . . . . G. FLAVOVIRESCENS
      3. Thallus squamulose, with a distinct black hypothallus.
         Apothecia pale orange; squamules abundant and not note wholly associated with the apothecia . . . . . Unk. L#15100
         Apothecia orange, the squamules scant and associated with the apothecia.. . . . Unk. W#19699
   2. Apothecia distinctly bicolored, the rims much paler yellow than the disk.
      4. Thallus pulvinate-thickened around the apothecia. . . . . Unk. W#13839
      4. Thallus thin to squamulose, but not pulvinate-thickened.
         Thallus with discrete squamules. . . . . Unk. H#1877
         Thallus more or less continuous.. . . . . Unk. L#16204

Gyalolechia flavorubescens (Huds.) Søchting, Frödén & Arup (L. *flavus*, yellow + *rubescens*, becoming red; perhaps from the emergence of orange apothecia from a yellow thallus) = *Caloplaca aurantiaca* of American authors, not (Lightf.) Th. Fr.; *Placodium aurantiacum* of Calkins. The Newton County specimen is from *Quercus velutina* in black oak savanna; the DuPage County record is from *Populus alba* in an old field. Calkins (1896) listed it from "elms and poplars at Glencoe; on hickories and other trees along the Des Plaines River." The Allegan County records are from *Tilia americana* at Mount Baldhead near Saugatuck. Curiously, he said it grew on rocks at Lemont and elsewhere; we wonder if these latter reports might have referred to what is now known as *Gyalolechia flavovirescens*. ~ Spores 15–18 μm × 6–10 μm, the septum 4–6 μm.

Allegan-MSC, Cook-MIN, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Kane-MOR, Newton-MOR, Winnebago-MOR

Gyalolechia flavovirescens (Wulfen) Søchting, Frödén & Arup (L. *flavus*, yellow + *virescens*, becoming green or flourishing; perhaps from the fecundity and tumescence of the apothecia) = *Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth. Locally this species is infrequent on dolomitic erratics, canyon walls, old quarries, and less frequently on weathered concrete ; it is much more common away from the region. ~ Spores 13–16 μm × 6–9 μm, the septum 4–6 μm.

Cook-MOR, DuPage-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake In-MIN, LaSalle-MOR, Racine-MOR, Walworth-MOR, Will-MOR

Gyalolechia sp. H#1877. The apothecia are evocative of *Xanthocarpia feracissima*, but the spores have a broad isthmus and the thallus is decidedly squamulose. The records are all from weathered concrete in Kendall and Will Counties. A Boone County record, from a dolomite prairie, is too scant to be certain of its placement.

Kendall-MOR, Will-MOR

Gyalolechia sp. L#15100. Actually more evocative of an *Athallia* with regard to the apothecia, but the apothecia are abundantly provided with bright yellow squamules over a black hypothallus. Known from a dolomite bluff, in full sun, overlooking the Des Plaines River.

DuPage-MOR

Gyalolechia sp. L#16204. Aside from the fact of its saxicolous habitat, it is evocative of *Gyalolechia flavorubescens*. There are specimens from DuPage and Lake counties in Illinois.

DuPage-MOR, Lake Il-MOR

Gyalolechia sp. W#13839. Rather like *Gyalolechia flavovirescens*, but the apothecia are characterized as having a yellow thalline margin outside the proper margin and the thallus is quite inflated. Our only specimen is from weathered concrete at Illinois Beach State Park, in Lake County, Illinois.

Lake Il-MOR

Gyalolechia sp. W#19699. The apothecia are bright orange with a proper rim, the thallus scant and yellow with a black hypothallus. Our only record is from weathered concrete in Nearby Henderson County, Illinois.

> **HALECANIA** M. Mayrhofer. CATILLARIACEAE [Photobiont: Chlorococcoid. In honor of the American lichenologist and educator, Mason Ellsworth Hale, 1929-1990, prolific student of the Parmeliaceae and creative observer of secondary metabolites, a syncopated combination of Hale and the genus Lecania, which *Halecania* resembles superficially. ~ Thallus crustose; apothecia lecanorine; asci *Catillaria*-type; spores 8, hyaline, 1-septate; conidia bacilliform.]

Halecania pepegospora (H. Magn.) van den Boom (Gr. pepego?, something to do with ice + spora, seed) ~ A species of siliceous rock, wide spread in districts east of us and reported for Wisconsin, we have yet to see it locally. Thallus dark-greenish to nigrescent, blastidiate or isidiate in patches; spores halonate, ellipsoid, 13–15 μm × 3–4 μm. [argopsin]

> **HEPPIA** Naeg. *in* A. Massal. LICHINACEAE [Photobiont: *Scytonema.* After Johann Adam Philipp Hepp, 1797–1867, German physician, lichenologist, and political activist, exiled in Switzerland. ~ Thallus squamulose, brown, terricolous, adnate; apothecia reddish, immersed in deep pit; spores 8, hyaline, simple; conidia bacilliform to fusiform.]

Heppia conchiloba Zahlbr. (L. *concha*, shell, or shell cavity + *lobus*, lobe, evidently from the deeply hollowed lobes bearing an apothecium) = *H. despreauxii* of Calkins; *H. lutosa auct., non* (Ach.) Nyl. Our specimens of this species are from dry gravelly hill prairies, where it grows on thin soil among carbonate pebbles where vascular vegetation is spare. Consistent lichen associates are *Placidium squamulosum* and *Psora decipiens*. Vascular vegetation is characterized by *Andropogon gerardii, A. scoparius, Arenaria stricta, Artemisia campestris caudata, Bouteloua curtipendula, Comandra richardsiana, Dalea purpurea, Euphorbia corollata, Liatris cylindracea, Lithospermum incisum, Scutellaria parvula* var. *leonardii, Silphium terebinthinaceum,* and *Solidago nemoralis*. It also grows in shallow soil over dolomite with *Bacidia bagliettoana, Placidium squamulosum,* and *Placynthium nigrum.* Previous reports of *H. adglutinata* (Kremp.) A. Massal. (L. *ad*, to or toward + *gluten*, glue + *-atus*, adjective ending) are referable here; its hymenium is IKI– throughout, whereas our specimens bear hymenia that at are at least partially IKI+ blue. ~ Spores ellipsoid to fusiform, 18–20 μm × 8–13 μm.

Cook-MOR, Kane-MOR, McHenry-MOR, Rock-MOR, Will-DUKE,MOR,WIS

HETERODERMIA Trevis. PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *heteros*, other, different + *derma*, skin, leather; from the complex algal and medullary layers in the upper cortex. ~ Thallus foliose, white to sordid, the principal lobes narrow, generally longer than wide, very often ciliate; upper cortex with elongate cells; lower cortex corticate or ecorticate, white or with tinctures of color; apothecia, if present, lecanorine; this disks brown; spores 8, brown, 1-septate, thick-walled.]

1. Thallus loosely ascending, the margins long-ciliate. . . . . H. ECHINATA
1. Thallus appressed, the margins not long-ciliate.
   2. Thallus beset with granular isidia over the surface; medulla K+ yellow turning red. . . . H. GRANULIFERA
   2. Thallus sorediate with fine, marginal soralia; medulla K+ yellow or K–.
      Lower surface with distinct yellowish tinctures, K+ purple tinges.. . . . . H. OBSCURATA
      Lower surface white throughout, K–.. . . . . H. SPECIOSA

Heterodermia echinata (Tayl.) W. Culb. (L. *echinatus*, prickly; from the stiff marginal cilia) Calkins & Huett (1898) cited this species from *Juniperus* in nearby La Salle County, Illinois, under the name *Physcia comosa*, which report may be referable here. We have seen specimens as far north as Union County, Illinois, where it does indeed grow on *Juniperus* , but it is hard to imagine what other species Calkins & Huett may have had in hand. Sterile specimens of *Physcia adscendens* with projecting rhizines might key here, but it has a smooth lower cortex, and the upper cortex is duller than *H. echinata* and usually more scabrid. [atranorin, zeorin]

Heterodermia granulifera (Ach.) W. Culb. (L. *granulus*, a small grain + *fero*, to bear, carry; from the numerous granulose isidia borne on the thallus) = *Physcia granulifera* of Calkins (1896), who reported this species from "hickories near Elgin and at Lemont." [salazinic acid, atranorin, ± zeorin]

Cook

Heterodermia obscurata (Nyl.) Trevis. (L. *obscura*, dark, shady, indistinct + *-atus*, likeness; perhaps from its surficial similarities to other sorediate species.) Rare, our only records are from the bark of *Populus deltoides* and *Prunus serotina*. [anthraquinones, atranorin, chloroatranorin, zeorin]

DuPage-MOR, Lake IN-MOR

Heterodermia speciosa (Wulf.) Trevis. (L. *speciosus*, showy, beautiful; from the attractive thallus) = *Physcia speciosa* of Calkins (1896), who reported it from Cook County. Our only contemporary record of this species is from the base of *Quercus alba* on a grazed kame near LaFox in Kane County. The LaSalle County record is from shaded mossy sandstone. There is a record from 1945 collected on *Acer saccharum* in Waukesha County. [atranorin, zeorin]

Cook, Kane-MOR, Lake IL-ILL,MIN, LaSalle-MOR, McHenry-ILL, Waukesha-WIS

HYPERPHYSCIA Müll. Arg. PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *hyper*, beyond, over, very; evidently meaning quite a *Physcia*, which see. ~ Thallus subcrustose, effigurate, the lowers surface adnate but corticate, pale to black, with rhizines essentially absent; apothecia, if present, lecanorine, the spores 8, brown to gray, 1-septate.]

1. Thallus esorediate; lobes confluent; apothecia nearly also present. . . . . H. SYNCOLLA
1. Thallus sorediate; lobes somewhat discrete; apothecia very rare.
   2. Soralia prevailingly marginal, labriform or irregular. . . . . H. CONFUSA
   2. Soralia nearly all surficial on the lamina, largely circular

      Thallus asymmetrically branched, olivescent with nigrescent lobes, the latter about as long as wide. . . . . H. L#19022

      Thallus more or less symmetrically branched, gray to nigrescent but not differentially so, the lobes ultimate lobes generally longer than wide. . . . . H. ADGLUTINATA

Hyperphyscia adglutinata (Flörke) Mayrh. & Poelt (L. *ad*, to or toward + *gluten*, glue + *-atus*, adjective ending; from the thallus lobes that appear glued to the bark) = *Physcia adglutinata* of Calkins; *Physciopsis adglutinata* (Flörke) M. Choisy. Small and inconspicuous, this species is ubiquitous on all manner of trees growing in open settings or in parks and landscaped areas; it is occasional on weathered lignin.

Allegan-MOR, Barry-MOR, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ottawa-MOR, Pulaski-MOR, Racine-MOR, Rock-MOR, St. Joseph In-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Hyperphyscia confusa Essl., Morse, & Leavitt (L. confusus, with mixed up thoughts; probably from its long over-looked status in *H. adglutinata*, where one might be seduced into thinking it was a depauperate *Physciella chloantha*) Though a little more frequent in central Illinois, our only record local records for this western species are from corticolous substrates, to wit *Ace saccharum, Celtis occidentalis, Juglans nigra, Pyrus calleryana,* and *Tilia cordifolia.* A

specimen at the Field Museum (Leavitt #11-356, F), is said to have been collected in DuPage County, in Aurora, which city is wholly within Kane County.

Barry-MOR, Benton-MOR, Boone-MOR, Calhoun-MOR, Cook-MOR, Ford-MOR, Fulton-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-F, Kankakee-MOR, Kendall-MOR, Kent-MOR, Kosciusko-MOR, Newton-MOR, Lake-IN -MOR, LaSalle-MOR, Steuben-MOR, White-MOR, Winnebago-MOR

Hyperphyscia syncolla (Nyl.) Kalb (Gr. *syn-*, combined + *kolla*, glue; from the thallus lobes that appear stuck together) = *Physciopsis syncolla* (Nyl.) Poelt. This species is much commoner from farther south. Our specimens are from *Carya ovata, Morus alba, Populus deltoides*, *Pyrus calleryana*, and *Salix nigra*, not necessarily from remnant areas.

Boone-MOR, Cook-MOR,NY, DeKalb-MOR, DuPage-MOR, Grundy-MOR, Kane-MOR, Kosciusko-MOR, Lee-MOR, McHenry-MOR, Racine-MOR, Rock-WIS

H. L19022 Evidently very rare and perhaps a new species. Our only record is from the partly decorticate bark of a Bur Oak that fell in a remnant woods at Greene Valley Forest Preserve. ~ The apothecia are rare, but the few spores that were mature were distinctly Mischoblastia-like (see Rinodina).

DuPage-MOR

HYPOCENOMYCE M. Choisy OPHIOPARMACEAE [Photobiont: *Trebouxia*. Gr. *hypo*, under, beneath, less than usual + *Cenomyce*, an old generic name; from its apparent resemblance to *Cenomyce.* ~ Thallus squamulose, greenish-brown, the squamules areolate or attached at one end and sorediate below or at the distal margin; apothecia biatorine, usually dark, the margin obscure in age; spores 8, hyaline, simple; conidia bacilliform to ellipsoid.]

1. Squamules sorediate along the margins. . . . . H. FRIESII
1. Squamules esorediate. . . . . H. SCALARIS

Hypocenomyce friesii (Ach.) Bendiksby & Timdal (In honor of the Swedish botanist and lichenologist, 1832– 1913, Theodor Magnus Fries) Yet unknown from our region this species is rather frequent in districts just to our north on both sides of Lake Michigan. ~ Spores ellipsoid, 4.5–7.5 μm × 2.5–3.5 μm.

Hypocenomyce scalaris (Lilj.) M. Choisy (L. *scalaris*, pertaining to a ladder; perhaps from the imbricate lobes evocative of ladder rungs) = *Psora scalaris* (Ach.) Hook. *f.* Our only two records of this northern species are from the trunk and lower limbs of a large *Quercus macrocarpa* at the Middle Fork Savanna, in Lake County, Illinois, and on *Larix laricina* in a bog northwest of East Troy, Walworth County. Another sorediate species, *Hypocenomyce anthracophila* (Nyl.) Bendiksby & Timdal [*Biatora anthracophila* (Nyl.) Hafellner], is known just to our northeast and in Missouri; it lacks lecanoric acid and has brown rather than black apothecia and characteristically grows on charred wood. ~ Spores not seen. [lecanoric acid]

Calhoun-MSC,, Lake Il-MOR, Porter-DUKE, Walworth-MOR

HYPOGYMNIA (Nyl.) Nyl. PARMELIACEAE [Photobiont: *Trebouxia.* Gr.

hypo, under, beneath, less than usual + *gymnos*, naked, lightly clad; from the smooth, rhizine-free lower cortex. ~ Thallus foliose, pale to greenish-gray or sordid, loosely attached, the lobes longer than wide, tube-like, commonly perforate at the tip, the lower cortex black, hollow, tube-like, without rhizines; apothecia usually broadly stipitate, lecanorine, the disc usually concave; spores 8, hyaline, simple.]

Hypogymnia physodes (L.) Nyl. (Gr. *physa*, an air bladder, bubble + *-ode*, like, resembling; from the inflated appearance of the thallus) = *Parmelia physodes* (L.) Ach. Rare, our few specimens of this common northern species are represented by small thalli about 2 cm in diameter. The Walworth County specimen is from *Larix laricina* in a bog northwest of East Troy; the La Porte County material is from *Fraxinus pennsylvanica* var. *subintegerrima* at Pinhook Bog. The Du Page County specimens are both from "bark" at the West Du Page Woods Forest Preserve. Calkins (1896) reported that it grew on "oaks in Cook and Du Page counties, and elsewhere." Farther north, in Allegan County, Michigan, we have collected it on scrubby trees of *Quercus velutina.* [atranorin, physodic acid, physodalic acid, protocetraric acid]

Allegan-MSC, Barry-MICH,MSC,WIS, Calhoun-MSC, Cook, DuPage-MOR, Laporte-MOR, Ottawa-MSC, Walworth-MOR,WIS

HYPOTRACHYNA (Vain.) Hale PARMELIACEAE [Photobiont: *Trebouxia.* Gr. *hypo*, under, beneath, less than usual + *trachyno*, to roughen; probably from the somewhat roughened appearance of the densely squarrose-rhizinate lower surface. ~ Thallus foliose, the lobes and lobules typically truncate, pale gray, the lower cortex black, brown distally, lustrous, with branched rhizines; apothecia thalline, the disks dark, usually concave; spores 8, hyaline, simple.]

Hypotrachyna livida (Tayl.) Hale (L. *lividus*, blue, bluish, leaden color; from?) = *Parmelia tiliacea* of Calkins and Berry. Berry (1941) reported it from Lake County, Illinois, but Culberson (1961) showed no specimens north of Peoria. Calkins (1896) reported it from "oaks at Riverside, Lemont and Hanover." [lividic acid, atranorin, 4–0–methylphysodic acid]

Cook, Lake Il

HYSTERIACEAE

These non-lichenized fungi are included because they are regularly mistaken for *Graphis* in the field. For a key to the Hysteriaceous fungi see www.eboehm.com.]

1. Spores merely septate; stromata less than 0.5 mm wide. . . . . **Hysterium**
1. Spores muriform; stromata more than 0.5 mm wide.
   Spores less than 30 μm long, mostly 3-4 septate, with 1 longitudinal septa, or perhaps 2 vertical septa in the middle cells.. . . . . **Hysterobrevium**
   Spores more than 30 μm long, mostly 7-9 septate, with 2-3 longitudinal septa. . . . . **Hysterograhium**

HYSTERIUM Pers. HYSTERIACEAE [Photobiont: absent. Gr. *hysteros*, womb; evidently an allusion to the female pudenda. ~ Thallus crustose, endophloedeal Apothecia elongate, navicular, carbonaceous, superficial, with a pronounced longitudinal slit; hamathecium of filiform pseudoparaphyses; spores, 8, septate, usually with at least 2 brown cells.]

1. Only the two middle cells brown, the end cells hyaline or nearly so. . . . . H. PULICARE
1. All four cells brown, the end cells no less brown than the middle ones. . . . . H. ANGUSTATUM

Hysterium angustatum Alb. & Schwein. (L. = *angusto*, crowd together, constrict, limit; perhaps an allusion to the gregarious nature of the hysterothecia) Frequent on a wide array of branches and branchlets, but under represented in herbaria. ~ Stromata 0.3–2 mm long × 0.15–0.3 mm wide; spores 16–30 μm × 4–9 μm.

Grundy-MOR, Kendall-MOR, Lake-IN -MOR

Hysterium pulicare (Lightf.) Pers. (L. *pulicarius*, of or having fleas; probably from the appearance of the small, somewhat irregularly shaped, black apothecia) Occasional locally, but also under collected. Our only specimen is from the bole of *Quercus rubra*. ~ Stromata 0.3–2 mm long × 0.15–0.3 mm wide; spores 23–25 μm × 8–9 μm.

Cook-MOR, DuPage-MOR, Kane-MOR, McHenry-MOR

HYSTEROBREVIUM (Schwein.) E. W. A. Boehm & C. L. Schoch HYSTERIACEAE [Photobiont: absent. A combination of *Hysterium* + L. brevis, short ~ Thallus crustose, endophloedeal Apothecia mostly longer than wide, navicular, carbonaceous, superficial, with a pronounced longitudinal slit; hamathecium of filiform pseudoparaphyses; spores 8, brown, muriform, with the longitudinal septa usually two or three and mostly not in the end cells.]

Hysterobrevium mori (Schwein.) E. W. A. Boehm & C. L. Schoch (presumably from its occurrence on the genus *Morus*. The only records we have is from *Quercus velutina* and *Tilia americana*. ~ Stromata 1.2–2 mm long × 0.6–0.9 mm wide; spores 19–22 μm × 8–9 μm.

Ford-MOR, Fulton-MOR, Jefferson-MOR

HYSTEROGRAHIUM Corda HYSTERIACEAE [Photobiont: absent. A combination of *Hysterium* and *Graphis*. ~ Thallus crustose, endophloedeal Apothecia mostly longer than wide, navicular to irregular, carbonaceous, superficial, with a pronounced longitudinal slit; hamathecium of filiform pseudoparaphyses; spores 8, brown, muriform, with the longitudinal septa usually two or three in all the cells]

Hysterographium fraxini (Pers.) De Not. (of *Fraxinus*) Our only record for this widespread species is from the bark of *Quercus alba*, where it grew on the smooth white

patches normally associated with *Julella fallaciosa*. ~ Stromata 1–1.6 mm long × 0.5–0.8 mm wide; spores 41–45 μm × 14–16 μm.

Walworth-MOR

IMSHAUGIA S. L. F. Meyer PARMELIACEAE [Photobiont: *Trebouxia.* After Henry A. Imshaug (b. 1925), American lichenologist recently retired from Michigan State University. Thallus foliose, narrow-lobed, pale gray, the lower cortex corticate, white to pale, the rhizines simple; apothecia, if present, lecanorine, the disks concave; spores small, 8, hyaline, simple; thamnolic acid.]

1. Isidia abundant; apothecia rare.. . . . . I. ALEURITES
1. Isidia absent; apothecia common. . . . . I. PLACORODIA

Imshaugia aleurites (Ach.) S. L. F. Meyer (Gr. *aleuron*, wheaten flour + *-ites*, having to do with, like; probably from the appearance of the tiny isidia, like the aleuron grains in certain wheat cells) = *Cetraria aleurites* of Calkins; *Parmeliopsis aleurites* (Ach.) Nyl. Calkins (1896) reported this species from "old rails near Lemont and Joliet." There is a specimen at MSC from near Goose Lake, in Calhoun County. [thamnolic acid, atranorin]

Calhoun-MSC, Cook, Will

Imshaugia placorodia (Ach.) S. F. Meyer (Gr. *plax*, a flat round plate, dish + *rodos*, flower, rose; perhaps it reminded Acharius of a flattened flower) This corticolous species occurs rather regularly just north of our region. ~ Apothecia tan, short stipitate. [thamnolic acid]

JULELLA Fabre TRYPETHELIACEAE [Photobiont: absent. L. *iulus*, catkin + *-ella*, diminutive; probably from the shape of the ascus. ~ Thallus crustose, endophloedeal, whitish; perithecia immersed; asci cylindric-clavate; ascospores 4–8, hyaline, muriform.]

1. Spores mostly 8 per ascus, narrowly ovate, to 23 μm long, submuriform.. . . . . J. FALLACIOSA
1. Spores fewer than 8 per ascus, ellipsoid to clavate many more than 23 μm long, abundantly muriform. . . . . J. LACTEA

Julella fallaciosa (Arnold) R. C. Harris (L. *fallax*, fallacious) = *Polyblastiopsis fallaciosa* (Arnold) Zahlbr. Our modern records are prevailingly from *Acer saccharum, Carya ovata, Quercus alba*, and *Q. rubra* in mesic woods. Although we have vouchers from only a few counties, this species and *Anisomeridium polypori* are quite common locally on trees in savannas and closed woodlands, although the latter is conspicuously associated with photobionts and has more elongate asci. Until I have a better understanding in this genus, I am including here local reports of *Julella sericea* (A. Massal.) Coppins. It is said to have ellipsoid to ovoid spores, evidently less narrowly so. ~ Spores 8 per ascus, 3-septate horizontally, narrowly ovate, 18–23 μm × 6–8 μm.

Allegan-MSC, Berrien-MOR, Calhoun-MOR, Cook-MOR,NY, DuPage-MOR, Fulton-MOR, Kalamazoo-MIN,MSC, Kendall-MOR, Kenosha-MOR, Lake Il-MOR, McHenry-MOR, Milwaukee-MOR, Rock-MOR,

Waukesha-MOR, White-MOR, Will-MOR

Julella lactea (A. Massal.) M. E. Barr. (L. *lacteus*, milky; probably from the white smears of thallus on bark) This species is known from districts north and south of the Southern Lake Michigan Region, but we have yet to document it locally. ~ Spores 4-6 per ascus, abundantly muriform, ellipsoid to clavate, 22–28 μm × 9–13 μm.

KIRSCHSTEINIOTHELIA D. Hawksw. PLEOSPORACEAE [Photobiont: absent. *Kirschsteinia* + Gr. *thele*, nipple; a pyrenocarpous lichen evocative of *Kirschsteinia*, a Sphaerialian fungus named after Wilhelm Kirschstein, 1863–1946, German mycologist. ~ Thallus crustose, endophloedeal, white; perithecia with the paraphyses much intertwined; spores 8, brown, 1-septate.]

Kirschsteiniothelia aethiops (Berk. & Curtis) D. Hawksw. (Gr. *aethiops*, appear unusual or irregular; perhaps from the spores with the constricted septum) The Cook County specimen, Calkins #162, "Ill., on oaks, etc. Glencoe," was identified by Calkins as *Pyrenula punctiformis*. This specimen has brown, 1-septate spores 21–34 μm long constricted at the septum and with the cells mostly unequal in the larger spores; the interthecial hyphae are massed and intertwined, but not deliquescent; spores are arranged more or less biseriately in the asci. From what we can tell, this more or less fits the description of *Microthelia micula* Körb., as *per* Harris (1973), which name Esslinger (2016) refers here. We do not actually think that this specimen is *Kirschsteiniothelia,* but the oversized spores take it out of any *Mycomicrothelia* described by Hawksworth (1985). Probably, we should just leave the thing out, since it is not even lichenized, as far as we can tell, but we are including it here under *K. aethiops* as a kind of "place holder" for the 1-septate, brown-spored, cylindrical-celled pyrenocarps with 8 spores *per* ascus and persistent pseudoparaphyses.

Calhoun-MSC, Cook-F, Kalamazoo-MSC

LATHAGRIUM (Ach.) Gray COLLEMATACEAE [Photobiont: *Nostoc.* Etymology known only to Acharius. ~ Thallus congested foliose, loose attached, irregularly lobed, olivaceous to nigrescent; lobes rounded, wrinkled and abundantly isidiate, the latter globose when wet; apothecia rare, the spores subglobose to ellipsoid, submuriform.]

1. Thallus lobes striate when dry; isidia thickly globose when wet. . . . . L. AURIFORME
1. Thallus lobes verrucose-ridge with dry; isidia small and scurfy when wet. . . . . L. FUSCOVIRENS

Lathagrium auriforme (With.) Otálora, P. M. Jørg., & Wedin (L. *auris*, an ear + *forma*, shape, appearance; from the folded thallus resembling an ear) = *Collema granosum* of Calkins (1896), who reported it from mossy rocks near the Des Plaines River. ~ Thallus foliose, the lobes to 1 cm broad, thick and swollen when wet, well beset with globose isidia; apothecia rare, the spore ellipsoid to ovoid, submuriform, 25–35 μm × 8–13 μm.

Will

Lathagrium fuscovirens (With.) Otálora, P. M. Jørg., & Wedin (L. *fuscus*, grayish brown + *virens*, becoming green) Yet unknown locally, this species is known from districts all around our region, where it grows on periodically moistened rocks or on mosses over rocks. ~ Thallus foliose, the lobes irregularly rounded to lobulate, usually not more than 5 mm broad; isidia numerous, subglobular to scurfy; spores 14–24 μm × 6.5–14 μm.

LECANIA A. Massal. RAMALINACEAE [Photobiont: Chlorococcoid. Gr. *lekane*, dish, pot; from the shape of the apothecia. ~ Thallus crustose, thin, greenish to olivaceous; apothecia lecanorine; asci bacidia-type, the spores 8, hyaline, 1–3 septate; conidia filiform, commonly curved.]

1. Thallus sorediate, yellowish-green; apothecia absent. . . . . L. CROATICA
1. Thallus esorediate, not yellowish green.
   2. Thallus saxicolous.
      3. Apothecia without pruina; spores 1-septate. . . . . L. ERYSIBE
      3. Apothecia at least thinly white pruinose; spores 2–3 septate.
         Apothecia thinly pruinose, many more than 1 mm across. . . . . L. SPADICEA
         Apothecia heavily pruinose, rarely to 1 mm across. . . . . L. NYLANDERIANA
   2. Thallus corticolous.
      4. Spores 1-septate. . . . . L. CYRTELLA
      4. Spores 2-3-septate.
         Apothecia without a lecanorine rim, epruinose; spores 8 per ascus. . . . . L. NAEGELII
         Apothecia lecanorine, usually pruinose; spore 8-16 per ascus. . . . . L. FUSCELLA

Lecania croatica (Zahlbr.) Kotlov (of Croatia) Occasional on bark in wooded remnant areas, our specimens from *Acer saccharum, Fraxinus nigra, Juglans nigra, Populus deltoides, Quercus alba, Quercus rubra, Tilia americana, Tsuga canadensis*, and *Ulmus rubra*. This is the species we have long known as "*Lecidea* sp. #4", following the speculation of Harris (1978).

Berrien-MOR, DeKalb-MOR, DuPage-MOR, Kane-MOR, Kenosha-MOR, LaPorte-MOR, LaSalle-MOR, McHenry-MOR, Porter-MOR, Rock-MOR, Waukesha-MOR, Will-NY, Winnebago-MOR

Lecania cyrtella (Ach.) Th. Fr. (Gr. *cyrto-*, bent, curved + -ella, diminutive; perhaps from the tiny curved spores) Yet unknown locally, this species is known from corticolous or lignicolous substrates as nearby as Green County, Wisconsin. ~ Apothecia epruinose, the margin rather thin, becoming scant or disappearing, 0.2–0.4 mm across; spores narrowly ellipsoid to fusiform, 1-septate, curved, 9–15 μm × 3–5 μm.

Lecania erysibe (Ah.) Mudd (Gr. erysibe, ergot; the purple-staining hymenium evidently evocative of the fruiting bodies of ergot) This species is occasional on dolomitic outcrops, and on weathered concrete. Calkins stated that this species grew on "calcareous rocks at Joliet and elsewhere." ~ Spores 1-septate, 13.3–16.0 μm × 3.9–4.8 μm.

Boone-MOR, DeKalb-MOR, Iroquois-MOR, Kankakee-MOR, Kenosha-MOR, LaSalle-F,MOR,NY, Lee-MOR, Ogle-MOR, Will-MOR

Lecania fuscella (Schaer.) Körb (L. *fuscus*, brown + *-ellus*, diminutive; from the color of the thallus) Known from just north of our region, this corticolous species has yet to be discovered locally. ~ Apothecia usually at least thinly pruinose, the margin lecanorine; spores straight or

curved, ellipsoid to fusiform, mostly 3-septate, curved, 12–20 μm × 4–6 μm.

Lecania naegelii (Hepp) Diedr. & van den Boom (in honor of the Swiss lichenologist, Carl Wilhelm von Nägeli, 1817-1891) Evidently uncommon, our only records are from the bark of *Acer saccharum, Populus* and *Prunus serotina*, in full sun. ~ Apothecia biatorine, epruinose; spores mostly 8, 2-3 septate, 13–25 μm × 4–6 μm.

Allegan-MOR,MSC, DuPage-MOR, Ottawa-MOR, Waukesha-MOR

Lecania nylanderiana A. Massal. (in honor of the Finnish lichenologist, William Nylander, 1822–1899, longtime professor at the University of Helsinki) A species of carbonate rock, this lichen is known from north and south of our region, though yet undocumented locally. ~ Thallus areolate to subsquamulose; apothecia lecanorine, notably pruinose; spores 3-septate, 12–17 μm × 4–5 μm.

Lecania spadicea (Flotow) Zahlbr. (L. *spadiceus,* deep reddish brown, date-colored; perhaps from the color of the moist epithecium) Not yet known from the Southern Lake Michigan region, it has been collected on shaded limestone in Jo Daviess County, Illinois. ~ Thallus conspicuous, nearly or quite effigurate; apothecia lecanorine, 1.5–1.8 mm in diameter, thinly pruinose; spores thin-walled, weakly curved, septate, 2-septate, thin-walled, 10–14 μm × 3–6 μm.

LECANOGRAPHACEAE

A. Spores 4–6 septate, less than 40 μm long.. . . . . **Alyxoria**
A. Spores more than 7-septate, more than 40 μm long. . . . . **Zwackhia**

LECANORA Ach. LECANORACEAE [Photobiont: *Trebouxia.* Gr. *lekane*, dish, pot + *horos*, margin, limit; from the rimmed apothecia. ~ Thallus crustose, powdery, granular, areolate or continuous, margins not effigurate; apothecia lecanorine, the spores 8, hyaline, simple; conidia filiform to bacilliform.]

1. Thallus or apothecia saxicolous.
   2. Thallus K-. . . . . L. POLYTROPA
   2. Thallus K+ yellow.
      Hymenium shallowly inspersed with coarse granules; zeorin absent. . . . . L. SAXIGENA
      Hymenium not inspersed; zeorin present. . . . . L. SUBIMMERGENS
1. Thallus or apothecia corticolous, lignicolous, or apothecia absent.
   3. Usnic or isousnic acid present; thallus generally with yellowish tints.
      4. Apothecial rim scant, soon disappearing, or apothecia absent; proper exciple evident.
         5. Thallus C+ orange. . . . . L. EXPALLENS
         5. Thallus C–.
            Apothecia absent. . . . . L. THYSANOPHORA
            Apothecia present. . . . . L. SYMMICTA
      4. Apothecial rim well developed; proper exciple absent.
         6. Thallus coarsely sorediate-granular fumarprotocetraric acid present; larger spores more than 6.0 μm wide.. . . . . L. CONIZAEOIDES
         6. Thallus sorediate or not, areolate-granular, ecorticate, to scant or absent; fumarprotocetraric acid absent; spores to 6.0 μm wide, or if wider then the thallus C+ deep yellow to orange.

7. Thallus scant or absent, with usnic acid only; apothecial rims with a dull, subpruinose inner ring contrasted with a shinier outer rim.. . . . . L. LAXA
7. Thallus scant to evident, with or without usnic acid, but if so then zeorin also present.
8. Thallus granular-areolate to subsorediate, yellowish green to whitish gray, the apothecial rims concolorous with the thallus; zeorin present.
Thallus C– .. . . . . L. STROBILINA
Thallus C+ orange. . . . . L. EXPALLENS
8. Thallus variously granular or areolate, but usually corticate, the apothecial rims concolorous with or lighter than the thallus; zeorin absent.
Apothecial rims evident, at least a first, becoming obscure in age as the disk becomes more convex, concolorous with the thallus; paraphyses simple or slightly branched; spores to 4.5 μm wide. . . . . L. ALBELLULA
Apothecial rims persistently evident, lighter than the thallus; paraphyses evidently branched; larger spores more than 4.5 μm wide.. . . . . L. SALIGNA

3. Usnic acid and isousnic absent, the thallus distinctly without yellowish-green tints
9. Apothecia decidedly pruinose, whitish, yellowish, or buff to light brown or roseate.
Disks C+ yellow.. . . . . L. CARPINEA
Disks C–.. . . . . L. CAESIORUBELLA CAESIORUBELLA
9. Apothecia epruinose or only slightly frosted, buff, grayish, or reddish brown to nigrescent, or apothecia absent.
10. Atranorin absent; thallus and rims K–. . . . . L. WISCONSINENSIS
10. Atranorin present; thallus and rims K+ yellow.
11. Thallus sorediate; zeorin present or absent.
Soredia emerging from a thin endophloedeal, often silvery thallus, frequently edged by a dark prothallus. . . . . L. NOTHOCAESIELLA
Soredia emerging from rather robust, corticate areoles, without a prothallus or with a white fibrous one . . . . . L. APPALACHENSIS
11. Thallus esorediate; zeorin absent.
12. Amphithecium without large angular crystals
Apothecia prevalingly less than 0.8 mm across; spores less than14 μm long. . . . . LECANORA GLABRATA
Apothecia largely more than 0.8 mm across; spores more than14 μm long. . . . . L. ALLOPHANA
12. Amphithecium with large angular crystals.
13. Epithecium clear, without crystals or granules.. . . . . L. ARGENTATA
13. Epithecium notably beset with granules.
14. Granules distributed down into the hymenium along the paraphyses.
Apothecial disks reddish brown to nigrescent; spores broadly ovoid; fumarprotocetraric acid present. . . . . L. PULICARIS
Apothecial disks pale to reddish brown; spores ellipsoid; fumarprotocetraric acid absent. . . . . L. HYBOCARPA
14. Granules limited to the epihymenium.
15. Apothecial margin strongly beaded or irregularly formed, the cortex less than 15 μm thick. . . . . L. CINEREOFUSCA
15. Apothecial margin smooth or nearly so, the cortex more than 15 μm thick.
Apothecia to 0.8 mm across; spores to 14 μm × 7.5 μm . . . . . L. CHLAROTERA
Apothecia and spores generally larger. . . . . L. RUGOSELLA

Lecanora albellula Nyl. (L. *albus*, white + *–ella*, diminutive + *–ula*, diminutive; little white one, or more likely a diminutive allusion to *L. albella* (Pers.) Ach. — which is known from well north of our region and has atranorin in the cortex) = *L. piniperda* Körb. This species is known from as nearby as Dane County, Wisconsin, where it grows oak bark. ~ Thallus scant to grayish-green; apothecia 0.5 – 1.5 mm across, sessile or becoming slightly constricted at the base in age, the margin smoothish to scant, the disk reddish to brown or blackish; paraphyses simple or slightly branched, usually swollen and darkened at the tips; spores 9.0–14.5 μm × 3.0–4.5 μm. [usnic acid]

Lecanora allophana Nyl. (Gr. *allos*, other, different + *phana*, to appear; an evident allusion to its different appearance from related species) This species has been reported several times from the Southern Lake Michigan region and is well known from neighboring districts but we have yet to discover a properly identified local specimen. It is especially frequent on *Fraxinus* and *Populus* elsewhere. ~ Apothecia 0.5–2.5 mm across, epruinose; spores 12–21 μm × 7–11 μm. [atranorin, triterpenoides other than zeorin]

Lecanora appalachensis Lendemer & R. C. Harris (from the Appalachian Mountains of eastern North America, the type locality) Our few records are from *Quercus macrocarpa* in open, often mowed areas, though it grows on the boles of other deciduous trees elsewhere. See also notes under *Lecanora nothocaesiella*. [atranorin, zeorin]

Cook-MOR, Newton-MOR, Winnebago-MOR

Lecanora argentata (Ach.) Malme (L. *argentatus*, silver) This species is known from as nearby as Green County, Wisconsin, where it grew on the bark of *Quercus velutina*. ~ Apothecia 0.4–1.5 mm across, epruinose; spores 10–16 μm × 5.5–9.0 μm. [atranorin, gangaleoidin]

Lecanora caesiorubella Ach. ssp. **caesiorubella** (L. *caesius*, light gray + *rubeo*, to be red + *-ellus*, diminutive; from the reddish apothecia) Our only record is one from Milwaukee County, collected in 1869 (Lapham *s.n.* WIS) and annotated by Imshaug & Brodo. A Calkins specimen of this species is cited from Illinois (Imshaug & Brodo 1966), so it likely was collected in or near the Southern Lake Michigan region. It is probable that Calkins's (1896) report of *Lecanora pallida* from Will County is referable here, the name used during the same era by Lapham. ~ Apothecia 0.8–3.0 mm across, heavily pruinose, the margin concolorous with the thallus; spores 12–15.5 μm × 5.0–9.5 μm. [atranorin, ± norstictic acid, ± protocetraric acid, ±virensic acid]

Milwaukee-WIS, Will

Lecanora carpinea (L.) Vainio (L. = of the hornbeam tree) Our only specimens are from the smooth bark of *Carya cordiformis* and young *Ulmus*. ~ Apothecia 0.5–1.3 mm across, heavily pruinose, the rim thin or thick; epithecium brownish and beset with granules, both the pigment and granules dissolving in KOH; spores 10–14 μm × 5.5–8.5 μm. [atranorin, sordidone]

Berrien-MOR, Cook-MOR, DuPage-MOR, Kendall-MOR, Marshall-MOR, Noble-MOR, Steuben-MOR, Waukesha-MOR

Lecanora chlarotera Nyl. (Gr. *klaros*, exultant + *teros*, fiefdom, temple, sacred district; the

allusion unclear, but the type locality, Jena, Thuringia, was the site of the German Confederation, Friedrich Schiller University, and home to many exalted German Romanticists) Frequent to common in districts ambient to the Southern Lake Michigan region, we have yet to discover a local specimen. ~ Apothecia 0.4–0.8 mm across, epruinose; epithecium reddish or orange-brown and beset with granules, both the pigment and granules dissolving in KOH; spores 9.5–15.5 μm × 5.5–7.5 μm. [atranorin, gangaleoidin, ± nephrosteranic acid]

Lecanora cinereofusca H. Magn. (L. *cinereus*, ash-colored + *fuscus*, brown; perhaps from the color of the apothecia) Our only contemporary collection is from the bark of an open-grown *Prunus serotina*. Brodo (1984) cites a Calkins (#61) specimen from La Salle County; he described the apothecia as: *"immersed in thallus, finally becoming sessile, 0.7–1.5 mm diameter; disks reddish orange, deep red, darkening to dark reddish brown or reddish black; margins at first thick, verrucose to ridged and rough, becoming discontinuous and thin in many specimens."* This specimen is referable to the typical variety; it grew with *Lecanora hybocarpa*. ~ Apothecia 0.7–1.5 mm across, rather scattered, the margin beaded; spores 10–15 μm × 7–8.5 μm. [atranorin, pannarin, usually placodialic acid]

DuPage-MOR, LaSalle-NY

Lecanora conizaeoides Cromb. (Resembling *L. coniza*, which comes from Gr. *konis,* dust + *-izein,* to make; probably from the dusty-granular thallus) This is one species that is almost certainly adventive from Europe. One of our records for this species is on the bark of *Pseudolarix kaempferi* at the Morton Arboretum; the other is from a weathered rail near Hartland, Wisconsin. ~ Thallus thick, granular to verrucose, becoming sorediate; apothecia 0.5–1.5 mm across, the lecanorine margin thick, with a gelatinous cortex at the base, without zeorin crystals, lighter than to concolorous with the thallus; paraphyses distinctly branched; spores 6–12 μm × 6–8 μm. [fumarprotocetraric acid, usnic acid]

DuPage-MOR, Waukesha-MOR

Lecanora expallens Ach. (L. *ex*, out of, utterly, thoroughly + *pallens*, becoming pale yellow; decidedly pale yellow, or perhaps an allusion to a similar appearance to *Biatora pallens*) Our only record for this species is from Barry County, Michigan, where it was collected on the bark of *Gleditsia triacanthos*. ~ Thallus abundantly sorediate-granular, ecorticate, usually with a white prothallus; apothecia absent or infrequent, the margin sorediate, concolorous with the thallus, in which it sometimes is immersed, 0.5–1.0 mm across; spores 6–9 μm × 3–4.5 μm. [thiophanic acid, usnic acid, zeorin]

Barry-MSC

Lecanora glabrata (Ach.) Malme (L. = *smooth*; from the smooth clear epithecium) Our only records are from the bark of open-grown trees of *Celtis occidentalis* and *Prunus serotina*, though it is said to be particularly frequent on *Acer* and *Fagus* elsewhere. ~ Apothecia 0.3–0.6 mm; × spores 9.5–14 μm × 5.5–8.0 μm. [atranorin]

DuPage-MOR, Ogle-MOR

Lecanora hybocarpa (Tuck.) Brodo (Gr. *hybos*, hump-backed + *karpos*, fruit; from the tumescent apothecia) Including *L. subfusca*, *L. s.* var. *allophana*, *L. s.* var. *argentata*, and *L. s.* var. *distans* of Calkins. Now rare on oaks, hickories, and ashes, Calkins (1986) indicated that it was

a common corticolous species. There is a sterile specimen from DuPage County that is characterized by "apothecia-like" pycnidia with filiform curved conidiospores. ~Apothecia 0.4–1.0 mm across, epruinose, with a lecanorine margin; epithecium reddish or orange-brown and beset with granules, both the pigment and granules dissolving in KOH; spores 10.5–14.5 μm × 5.5–8.5 μm. [atranorin, ± roccellic acid]

Allegan-MOR, Benton-MOR, Cook-NY, DuPage-MOR, Kane-MICH, Lake Il-MOR, LaSalle-NY, McHenry-ILL, Ogle-MOR, Walworth-MOR

Lecanora laxa (Śliwa & Wetmore) Printzen (L. *laxus*, relaxed, not tense, released; perhaps from the scant thallus) = *Lecanora vara* (Hoffm.) Ach. var. *laxa* Śliwa & Wetmore. Our only record for this species is from weathered wood in LaSalle County. According the Śliwa & Wetmore (2000) *Lecanora varia* is strictly European and that var. laxa is the eastern North American element. Unlike our other species in the *Lecanora vara* group, *L. laxa* is known only from lignin. ~ Thallus scant or absent; apothecia 0.5–1.5 mm across, sessile, becoming constricted at the base in age, the margin with a dull, subleprose inner ring and a shinier outer ring; paraphyses simple, not swollen or darkened distally; spores 6.0–9.0 μm × 3.0–4.5 μm. [usnic acid]

LaSalle-F

Lecanora nothocaesiella R. C. Harris & Lendemer (L. *nothus*, false, mongrel, cross-bread + *caesiella*; an allusion to the superficial similarity to *Lepraria caesiella*) Our local records are all from open-grown oaks, commonly in rather disturbed areas. It is generally sympatric with *Lecanora appalachensis*, both of which species are discussed by Lendemer *et al.* (2013). The differences are nuanced between the two species and take some experience to get one's mind around. The latter generally has larger soredia. *Lecanora nothocaesiella* could be confused with the wholly leprose *Lepraria caesiella*, which bears its soredia on the surface of the substrate, without even a thin or endophloedeal thallus. Also, the soredia of *L. nothocaesiella* tend to erode into more or less gelatinized masses. *Lecanora layana* Lendemer (in honor of the New England lichenologist, Elisabeth Lay, a founding member of the Tucker man Lichen Workshop) is nearly identical but produces stictic acid in addition to atranorin and zeorin. It is known from districts all around the our region. [atranorin, zeorin]

Iroquois-MOR, Kendall-MOR, Kenosha-MOR, LaSalle-MOR, Newton-MOR, Walworth-MOR

Lecanora polytropa (Hoffm.) Rabenh. (Gr. *poly*, many + *tropo,* change, turn; perhaps evoking its variable thallus development) This species occurs frequently just to the north of our region on granitic boulders, particularly those that are commonly visited by perching birds. Our only records from a granitic or quartzite erratics. ~ Apothecia 0.3–1.2 mm across, pale yellow to brownish, with or without pruina, the lecanorine margin paler than the disk, becoming thin or disappearing in age; epithecium with granules dissolving in KOH; spores 10–14 μm × 5–8 μm. [rangiformic acid, usnic acid, zeorin, and fatty acids]

Barry-MICH, DuPage-MOR

Lecanora pulicaris (Pers.) Ach. (L. *pulicaris*, with or bearing fleas, the allusion here unclear) Rather frequent just north and east of southern Lake Michigan, our only record is from the bark of *Rhamnus cathartica*. ~ Apothecia 0.3–1.5 mm across, epruinose, with a lecanorine

margin; epithecium reddish or brown and beset with granules, both the pigment and granules dissolving in KOH; spores 9.5–14.5 μm × 7–10 μm. [atranorin, fumarprotocetraric acid, ± rocellic acid]

DuPage-MOR

Lecanora rugosella Zahlbr. (L. *rugosus*, wrinkled + *–ella*, diminutive; little wrinkled one) Yet unknown locally, this corticolous and lignicolous species is from *Cephalanthus occidentalis* and *Thuja occidentalis* as near as Ingham and Lake counties, Michigan. ~ Thallus verruculose to granular-areolate, corticate; apothecia sessile to substipitate, 0.5–3.0 mm across; the rims paler than to concolorous with the thallus; spores 12–17 μm × 7.0–11 μm. [atranorin, gangaleoidin, roccellic acid]

Lecanora saligna (Schrad.) Zahlbr. (L. salignus, like or of willow; from a supposed frequency of occurrence on willow) Most of our specimens are from old wood; Wetmore's specimen from Lake County, Indiana, was from *Quercus rubra*, and the St. Joseph County, Indiana, specimen is from *Carya ovata*. Skorepa's (1970) report of *L. symmicta*, which see, from Will County is referable here. Most previous reports of "*L. umbrina*" are referable here. ~ Epiphloeic thallus absent or nearly so; apothecia 0.4–1.5 mm across, epruinose or appearing somewhat pruinose when wet, the lecanorine margin paler than the disk, strong at first, becoming less so in age; paraphyses distinctly branched, slightly swollen and darkened distally; epithecium reddish or orange-brown and beset with granules, the latter dissolving in KOH; spores 9.0–13.5 μm × 3.0–6.0 μm. [isousnic acid, ± terpenes other than zeorin]

Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Kane-MOR, Lake Il-MOR, Lake In-INDU, LaSalle-MOR, McHenry-MOR, Porter-MIN, St. Joseph IN-MOR, Will-MOR

Lecanora saxigena Lendemer & R. C. Harris (L. *saxum,* stone + *gena,* born, arising from rock; from its saxicolous habitat) = *Lecanora cinereofusca* H. Magn. var. *appalachensis* Brodo. This southeastern species of the Interior Low Plateaus and Appalachian Mountains is know from nearby Warren County, Indiana, where it grew on siliceous rock. ~ Apothecia 0.7–1.5 mm across, closely aggregated, the margin beaded; hymenium shallowly inspersed with coarse granules; spores 10–15 μm × 7–9 μm. [atranorin, pannarin, rocellic acid]

Lecanora strobilina (Spreng.) Kieff. (Gr. *strobilos,* anything twisted + *inus* pertaining to; derivation uncertain) This species is characteristic of weathered fence rails, often with *Caloplaca microphyllina, Chrysothrix caesia*, and *Lecanora symmicta*. One of our specimens is from a planted specimen of *Betula pendula*, another from a planted specimen of *Gleditsia triacanthos,* and one from a planted tree of *Liriodendron tulipifera.* There are also specimens from *Acer saccharinum, Carya ovata, Quercus alba, Quercus macrocarpa, Quercus rubra,* and *Rhus typhina*. ~ Thallus thick, granular to verrucose, becoming sorediate or scurfy, greenish to yellowish-gray, characteristically beset with zeorin crystals; apothecia commonly aggregated, weakly constricted at the base and without a gelatinous cortex, 0.4–0.9 mm across; paraphyses simple, straight; spores 10.5–15.0 μm × 3.0–4.5 μm. [usnic acid, zeorin, ± squamatic]

Allegan-MOR, Benton-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Iroquois-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR, Kosciusko-MOR, Lee-MOR, Lake In-MOR, LaSalle-MOR, Livingston-MOR, Marshall-MOR, Milwaukee-MOR, Ogle-MOR, Pulaski-MOR, Walworth-MOR, Waukesha-MOR,WIS, Will-MOR, Winnebago-MOR

Lecanora subimmergens Vain. (L. *sub-*, somewhat + *immergo*, to immerse; from the somewhat immersed younger apothecia) This species is not infrequent in regions ambient to the Southern Lake Michigan region, although we have yet to secure a local record. ~ Thallus whitish, continuous to more or less rimose-areolate, usually with a white prothallus; apothecia commonly aggregated centrally, the rim concolorous with the thallus, 0.4–1.4 mm across; disk reddish to orange-brown; epithecium without granular crystals, the pigment not dissolving in KOH; spores 10–15 μm × 5–8 μm. [atranorin, zeorin]

Lecanora symmicta (Ach.) Ach. (Gr. *syn-*, combined + *miktos*, mixed, thrown together; from the irregular aggregations of apothecia) = *L. varia* var. *symmicta* of Calkins. Calkins reported that there were "numerous varieties" in the region; it contains usnic acid ± psoromic or fumarprotocetraric acids. Most early Illinois specimens called *L. varia* are referable either to *L. laxa* or *L. strobilina*. Our entity is fairly frequent on a wide variety of corticolous and lignicolous substrates, particularly in disturbed or landscaped areas. Some specimens called "*Lecanora varia saepinicola*" by Calkins are referable here. ~ Thallus pale yellowish-green to grayish or bluish, verrucose-areolate to rimose, generally ecorticate; albescent marginally and around the areoles; apothecia yellowish-beige, nearly or quite without a thalline margin, 0.5–1.5 mm across; epithecium granular; spores 9–10.5 μm × 3–4.5 μm. [usnic acid, zeorin, ± xanthones]

Barry-MSC, Berrien-MOR,Branch-MICH, Calhoun-MSC, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, LaGrange-MOR, La Porte-MOR, McHenry-MOR, Milwaukee-MOR, Racine-MOR, Rock-MOR, St. Joseph In-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Lecanora thysanophora R. C. Harris (Gr. *thysanos*, a fringe, tassel + *phoros*, a bearing; from the possession of a white fibrous prothallus that emerges at the margins of the thallus resembling a fringe) This is a lichen of cool, mesophytic forests where we have specimens from *Carya cordiformis, C. ovata, Fraxinus americana, Quercus alba, Q. rubra,* and *Ulmus americana*. It is abundant at the Wayne Grove Forest Preserve in northwestern DuPage County. A similar species, with usnic acid, zeorin, and thiophanic acid, *Lecanora expallens* Ach., has also been reported from the western Great Lakes region. [atranorin, zeorin, usnic acid ± porphyrilic acid]

Berrien-MOR, DuPage-MOR, Kane-MOR, Lake Il-MOR, McHenry-MOR, Porter-MIN,MOR, Walworth-WIS, Waukesha-MOR, Winnebago-MOR

Lecanora wisconsinensis H. Magn. (of Wisconsin) Our only record for this lichen locally is on the lower trunk and horizontal root of a small ash growing in rubble. ~ Thallus grayish, verrucose, continuous; apothecia often aggregated in small clusters, the rim paler than the thallus, the disk reddish, epruinose; epithecium granular; spores 11–17 μm × 6–10 μm.

Berrien-MOR

LECANORACEAE

A. Exciple not thalloid, without and algal component.
  Thallus UV+ faint orange [lichexanthone]. . . . . **Phyrrhospora**
  Thallus UV–, without lichexanthone.. . . . . **Lecidella**
A. Exciple thalloid, with algae an algal component.

B. Thallus placoidioid, with lobed margins. . . . . **Protoparmeliopsis**
B. Thallus not placoidioid, without lobed margins.
C. Apothecia adnate, the disks flesh-colored, some of them 2 mm or more across; thallus saxicolous, of scattered to aggregated, smooth, convex areoles. . . . . **Rhizoplaca**
C. Apothecia and thalli various, but not as above.
Thallus absent or scarcely evident near the apothecium; apothecia without isousnic acid, usnic acid, or atranorin. . . . . **Myriolecis**
Thallus thick or thin but generally evident, or if absent then the apothecia with usnic acid, isousnic acid, or atranorin. . . . . **Lecanora**

LECIDEA Ach. LECIDEACEAE [Photobiont: *Trebouxia*-like. Gr. *likos*, dish; the Latinized diminutive, an allusion to the small dish-like apothecia. ~ Thallus crustose, thin and continuous, rimose to areolate; apothecia lecideine, the epithecium brown or greenish, the hypothecium hyaline to brown, the spores 8, hyaline, simple; ascus *Lecidea*-type; conidia bacilliform.]

Lecidea plebeja Nyl. (L. *plebeius*, one among the common people, Nylander's allusion abstruse—as is often the case) Yet unknown from the Southern Lake Michigan region, this species has been recorded regularly in districts ambient to the region. Elsewhere it grows on the lignin of fallen logs and stumps of *Pinus* and *Juniperus* species. ~ Thallus thick, areolate crust, the ascoma with a nigrescent, convex, many more than 0.5 mm across hypothecium and capitate paraphyses; hypothecium brown to nigrescent; spores 5–9.5 μm × 2.5–3.5 μm.

LECIDEACEAE

A. Thallus not on mosses, usually saxicolous or corticolous. . . . . **Lecidea**
A. Thallus on mosses or humus, often over rock.
Spores 0–2 celled; ascus *Porpidia*-type. . . . . **Bryobilimbia**
Spores most 3–4 celled; ascus *Lecidea*-type. . . . . **Mycobilimbia**

LECIDELLA Körb. LECANORACEAE [Photobiont: *Chlorella*-like. *Lecidea* + *-ella,* diminutive; evidently appears like a little *Lecidea.* Thallus crustose, thin, gray or grayish; apothecia black, lecideine; spores 8, hyaline, simple; axis of ascus apex not amyloid, *Lecanora*-type; conidia filiform.]

1. Thallus corticolous. . . . . L. EUPHOREA
1. Thallus saxicolous. . . . . L. STIGMATEA

Lecidella euphorea (Flörke) Hertel (Gr. *euphoros,* healthy; perhaps from the relatively large, tumescent apothecia, appearing as though quite healthy) Our only record for this species from two Willey specimens (#47 & #51, ILL, as *Lecidea enteroleuca*), one collected on poplar bark, the other on sumac, both at Algonquin, Illinois. ~ This species is characterized by spores mostly 10–16 μm × 6.0–10 μm, a dark blue green epithecium, yellowish brown hypothecium, and slender, branched, scarcely dilated paraphyses. The cortex is K+ yellow, KC+yellow, and C+orange. We are including here a similar species, *L. elaeochroma* (Ach.) M.

Choisy, which has been reported from districts just north of our region. [atranorin, isoarthothelin, thiophanic acid, 5,7-di chloro-3-O-methylnorlichexanthone].

McHenry-ILL

Lecidella stigmatea (Ach.) Hertel & Leuckert (Gr. *stigma*, a mark made by a pointed instrument, dot, a Latinized plural alluding to the numerous "dots" or apothecia) Our only record for this species is one collected in on a sandstone outcrop in LaSalle County. ~ Cortex is K+yellow, C+yellow, KC+ yellowish red; hymenium without oil droplets, the paraphyses not coherent in water of KOH; hypothecium hyaline; spores 11–17 μm × 6.0–9.0 μm. [atranorin, chloroatranorin, hopane-6a,22diol, lichexanthone]

LaSalle-MOR

LEIMONIS R. C. Harris PILOCARPACEAE [Photobiont: Chlorococcoid. Gr. *Leimon*, Hesiod's word for field in the Poem, Theogony, in which he describes the genealogy of the gods, the allusion here in reference to the common occurrence of this lichen in open areas, especially old fields often in early stages of succession. ~ Thallus crustose, dark gray, saxicolous; apothecia numerous, small, black; spores 8, hyaline, simple; apex of ascus strongly amyloid.]

Leimonis erratica (Körb) R. C. Harris & Lendemer (L. *erraticus*, wandering to and fro; perhaps from it frequent occurrence on glacial erratics) = *Lecidea erratica* Körb; *Micarea erratica* (Körb) Hertel, Rambold & Pietschmann. Our only record for this species is an old field near Portage. ~ Generally, the apothecia appear to have the tincture of blue-black near the rim with the epihymenium showing a pale brown. A Calkins & Huett (1898) report of *Lecidea cyrtidia* Tuck., from rocks in LaSalle County, may be referable here. Previous reports of "*Brianaria sylvicola*" are referable here. ~ Spores 6–11 μm long, 2.5–4.5 μm wide.

Kalamazoo-MSC, St. Joseph IN- MOR

LEMPHOLEMMA Körber LICHINACEAE [Photobiont: *Nostoc*. Gr. *lemphos*, putrescent carcasses + *lemma*, that which is pealed off, rind; probably an allusion to its appearance as small crusts of rotting rind. ~ Thallus gelatinous, squamulose or dwarf fruticose with terete branches, black; apothecia tiny, scarcely lecanorine, the spores hyaline, simple, subglobose.]

Lempholemma cladodes (Tuck.) Zahlbr. (Gr. *kladion*, a small branch; from its resemblance to a small *Cladonia*) We have one record from a dry, sandy prairie, about 15 cm off of a limestone trail and another from the soil between cracks on a massive dolomitic exposure. ~ Spores 15–20 μm in diameter.

DuPage-MOR, Will-MOR

LEPRA Scop. PERTUSARIACEAE [Photobiont: Chlorococcoid. Gr. *lepra*,

leprosy; evocative of the sorediate warts of some species. ~ Thallus crustose, often thinning to a paler margin, the apothecia in thalloid warts, sorediate or pruinose; spores large, thick-walled, 1–8, hyaline, simple]

1. Medulla K+ deep yellow. . . . . L. TRACHYTHALLINA
1. Medulla K- or weakly yellow eventually
   Warts KC+ violet, picrolichenic acid present. . . . . L. AMARA
   Warts KC–, picrolichenic acid absent. . . . . L. MULTIPUNCTOIDES

Lepra amara (Ach.) Hafellner (L. *amarus*, raw, doleful, dire; the allusion not immediately discernable) = *Pertusaria amara* (Ach.) Nyl. Known from districts all around our region, we have yet to document it locally. Spores said to be one per ascus, although we know of no observations. Some authorities place this species in the genus *Variolaria* Ach. (L. variola, smallpox; of which it can be construed as evocative. ~ Sorediate warts 0.3–0.8 mm across. [picrolichenic and protocetraric acid]

Lepra multipunctoides (Dibben) Lendemer & R. C. Harris (L. *multus*, many + *punctum*, dot, spot + *-oideus*, form of, type; from the appearance caused by the numerous tiny warts) = *Pertusaria multipuncta* of Calkins (1896), who reported it from oaks and hickories, stating that it was not rare. ~ Thallus gray to bluish-gray, continuous; warts abundant, sorediate, corticate initially, 0.2–0.5 mm across; spore 1 per ascus, smooth. [fumarprotocetraric and succinprotocetraric acids, ± protocetraric acid]

Cook

Lepra trachythallina (Erichs.) Lendemer & R. C. Harris (Gr. *trachys*, rough + *thallinus*, in reference to the body of a thallus) Our only record for this species is from a mesophytic forest. = *Pertusaria trachythallina* Erichs. ~ Thallus gray, generally densely and subisidiate with minute verruculose with corticate pustules, the warts gregarious but distinct, but irregularly formed; spores 2 per ascus, smooth. Other than medulla chemistry, this species differs from the former in that the apothecia are heavily pruinose rather than sorediate. [thamnolic acid]

Kalamazoo-NY

LEPRARIA Ach. STEREOCAULACEAE [*Trebouxia* and *Stichococcus.* Gr. *lepra*, leprosy + *-arius*, like or connected with; from the scurfy appearance of the thalli. ~ Thallus crustose, leprose, the sorediate units wholly ecorticate, surficial; ascomata and pycnidia not seen.]

1 Divaricatic acid present; thallus bluish gray; thallus UV+ blue-white. . . . . L. HODKINSONIANA
1. Divaricatic acid absent: thallus bluish gray or not; thallus UV–.
   2. Alectorialic acid present.
      Thallus with placoidioid margins, the granules ecorticate.. . . . . L. EBURNEA
      Thallus without placoidioid margins, the granules largely corticate. . . . . L. NEGLECTA
   2. Alectorialic acid absent.
      3. Thallus with distinct tinctures of yellow, K+ red in pigmented areas; zeorin absent;. . . L. VOUAUXII
      3. Thallus without yellowish tinctures, K+ yellow; zeorin present.

4. Thallus with stictic acid, thick, typically pale greenish gray. . . . . L. FINKII
4. Thallus without stictic acid, thick or thin, bluish gray to white.
   5. Thallus with protocetraric acid, P+ orange. . . . . L. NORMANDINOIDES
   5. Thallus without protocetraric acid, P-.
      Thallus margins placoidioid, the granules with rhizohyphae evident on the surfaces. .. . . . . L. HARRISIANA
      Thallus margins not placoidioid, the granules without rhizohyphae. . . . L. CAESIELLA

Lepraria caesiella R. C. Harris (L. *caesius*, pale blue + *ella*, small) This species generally includes many local reports referred to as sp. #1 based upon MOR specimens. Most of our specimens are from *Quercus* species, but it is also known locally from the bases of *Acer saccharum* and *Fraxinus americana.* See also notes under *Lecanora nothocaesiella*. ~ Rhizohyphae absent. [zeorin, atranorin, ± pallidic acid]

Berrien-MOR, Cook-MOR, DuPage-MOR, Iroquois-MOR, Jasper-MOR, Kane-MOR, Kenosha-MOR, LakeIL-MOR, Lake IN-MOR, LaPorte-MOR, Newton-MOR, Porter-MOR, Rock-MOR, Walworth-MOR, Will-MOR

Lepraria eburnea J. R. Laundon (L. *eburneus*, the color of ivory) Our only record is from a partly shaded sandstone bluff face at Magnolia Bluff County Park. Rhizohyphae uncommon. [alectorialic acid, ± barbatolic acid, ± protocetraric acid]

Rock-WIS

Lepraria finkii (B. De Lesd.) R. C. Harris (in honor of the prominent American lichenologist, Bruce Fink, 1861–1927) Older reports of *Pannaria lanuginosa* Ach. inevitably turn out to be some species of *Lepraria*, and specimens so named from this region usually are *L. finkii*. Half of our material is from the bases of *Quercus* in partly shaded to fully shaded areas. Other corticolous substrates include *Tilia americana, Thuja occidentalis, Acer saccharinum,* and *Tsuga canadensis*. It also grows on shaded dolomite and on cliff faces, as well as on fallen logs, on soil, or among mosses in moist humid areas. ~ Rhizohyphae usually present. Occasional thalli have portions with inspersions reacting UV+ white.. [stictic acid, constictic acid, zeorin, atranorin, often a trace of norstictic acid]

Berrien-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR,NY, Lee-MOR, McHenry-MOR, Milwaukee-WIS, Ogle-MOR, Porter-MOR, Racine-MOR, Rock-WIS, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Lepraria harrisiana Lendemer (in honor of the foremost American botanist, Richard Clinton Harris, 1939– , peerless authority on the pyrenocarpous fungi) Known from districts ambient to our region, this species has yet to be collected locally. The chemistry is identical to that of *Lepraria caesiella*, but the margins are thick and placodioid. ~ Rhizohyphae present. [zeorin, atranorin, pallidic acid]

Lepraria hodkinsoniana Lendemer (in honor of the American lichenologist, Brendan Paul Hodkinson, 1983 –) Many of our specimens equate to name *L. incana* as used by McKnight, Wilhelm & Whiteside (1987). Most of our specimens are from the bases of *Quercus*; many others are from a sandstone exposures. Most local reports of "*L. incana*" are referable here. Rhizohyphae abundant. Another species that produces divaricatic acid and reacts UV+ blue-white is *Lepraria cryophila* Lendemer, which grows as nearby as Clark County, Illinois. It

produces nordivaricatic acid and lacks zeorin, however, and reacts C+ pink; also, it is notably placodioid, while *L. hodkinsoniana* has an "aggregate" thallus. [divaricatic acid, zeorin]

Boone-MOR, Cook-MOR, Jasper-MOR, Jefferson-MOR, LaSalle-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Winnebago-MOR

Lepraria neglecta (Nyl.) Lettau (L. *neglectus*, neglected, not chosen; perhaps from its nondescript appearance) Our only records for this species are from exposed sandstone in our western sector. Rhizohyphae absent. Our specimens are all *L. neglecta s.s.* Included in *L. neglecta* by Lendemer (2013) is *L. caesioalba* (B. de Lesd.) J. R. Laundon; it has atranorin and fumarprotocetraric acid, but is morphologically similar to *L. neglecta* in its more or less corticate granular soredia. In Illinois, it is known only from the Shawnee hills. [alectorialic acid ± roccellic/angardianic acid]

Lee-MOR, Ogle-MOR

Lepraria normandinoides Lendemer & R. C. Harris (resembling the genus Normandina; particular with regard to the rounded, thickened, placodioid marginal lobes) Our few records are from both tree bases and from siliceous dolomitic outcrops. Previous reports of *Lepraria lobificans* Nyl. are referable here. [atranorin, roccellic/angardianic acid, protocetraric acid]

Cook-MOR, Livingston-MOR, Pulaski-MOR, Will-MOR, Winnebago-MOR

Lepraria vouauxii (Hue) R. C. Harris (In honor of the French mycologist, Father Leo Vouaux,1870–1914.) Our only record for this species is from shaded sandstone outcrops at Castle Rock State Park. [pannaric acid 6-methylester, oxypannaris acid 6-methylester, ± atranorin, ± roccellic/angardianic acid]

Ogle-MOR

LEPROPLACA (Nyl.) Hue TELOSCHISTACEAE [*Trebouxia.* Gr. *lepra*, leprosy + *plax*, a flat round plate, dish; from the scurfy thalli with rounded margins. Photobiont: mostly "*Pseudotrebouxia.*" ~ Thallus crustose, yellow or brownish-yellow, leprose, or corticate and effigurate; ascomata and pycnidia not seen. anthraquinones, particularly parietin.]

1. Thallus wholly leprose; apothecia absent. . . . . L. CHRYSODETA
1. Thallus corticate, effigurate, with discrete soralia. . . . . L. CIRROCHROA

Leproplaca chrysodeta (Räsänen) J. R. Laundon There is a specimen of what appears to be this species from a dolomitic cliff face along Cedarville Bluff in Stephenson County. It contains a substance that is 7, 7, 7 in TLC. ~ Thallus is composed of yellowish-gray, pulverulent, wholly ecorticate spherical granules (compare with the granules of *Flavoplaca citrina*, which are at least partly corticate; .

Leproplaca cirrochroa (Ach.) Th. Fr. (L. *cirrhus*, yellowish, tawny orange + Gr. *chroa*, superficial color; perhaps from yellow thallus lobes) Our only records for this species are from dry limestone exposures in our western sector. The Winnebago County specimen is admixed with *Flavoplaca citrina*. ~ *Caloplaca* species with which it might be confused lack soredia and usually bear apothecia.

LaSalle-MOR, Winnebago-MOR

LEPTOGIUM (Ach.) Gray COLLEMATACEAE [Photobiont: *Nostoc.* Gr. *leptos*, peeled, slender, thin, weak + *ge*, the earth, land; perhaps from the thallus lobes that appear as thin shavings on the ground in terricolous species. ~ Thallus foliose, gelatinous, lead-gray to nigrescent, the upper surface with a cellular cortex, the lower various, with or without a pubescent indument; apothecia lecanorine, the spores 4–8, hyaline, septate to muriform.]

1. Lower surface of lobes whitish tomentose. . . . . L. HIRSUTUM
1. Lower surface without tomentum.
   2. Thallus without isidia. . . . . L. CORTICOLA
   2. Thallus isidiate.
      Upper surface of thallus strongly wrinkled, the lobes becoming fused. . . . . L. MILLIGRANUM
      Upper surface of thallus smooth, the lobes distinct. . . . . L. CYANESCENS

Leptogium corticola (Tayl.) Tuck. (L. *cortex*, bark, cork + *colo*, to inhabit; from its habitat on tree bark) = *L. pulchellum* of Calkins (1896), who reported that it grew on calcareous rocks in Will County and on elms in Cook County, and noted that it was "better developed" farther south in Illinois.

Cook, LaSalle-ILL, Will

Leptogium cyanescens (Rabenh.) Körb. (Gr. *kyaneos*, dark blue + *-escens*, meaning beginning to, slightly; from the not quite dark blue thallus) Uncommon, our only specimens of this species are from shaded dolomitic cliffs and from shaded base-rich boulders in streams. Calkins (1896) did not mention it.

Cook-MOR, DuPage-MOR, Kankakee-MOR, LaSalle-MOR, Livingston-MOR, Will-MOR, Winnebago-MOR

Leptogium hirsutum Sierk (L. *hirsutus*, hairy; from the tomentose lower surface) = *L. myochroum* of Calkins, a name that currently is synonymous with *L. saturninum* (Dicks.) Nyl., which grows farther north. Sierk (1964) mapped *L. hirsutum* Sierk from extreme northwestern Indiana but cited no specimens, although there is a specimen at (Calkins *s.n.*, F) from "Illinois", which is likely to be either from Cook or LaSalle counties; it was annotated by Sierk himself. Calkins (1896) reported the habitat as the same as for *L. milligranum,* which see. Previous reports of *Leptogium burnetiae* C. W. Dodge are referable here. Similar is *Leptogium saturninum* (Dicks.) Nyl. (L. *saturninus*, gloomy, dull, depressed), which occurs Just north of our region; it is olivaceous to nigrescent with the lobe tips thickened and abundantly beset with isidia. ~ Thallus prevailingly steel-gray, the lobes thin throughout, with large areas free of isidia that are even beset with fine hairs.

Will

Leptogium milligranum Sierk (L. *mille*, a thousand + *granum*, a seed; from the numerous seed-like isidia. The specific epithet is sometimes spelled "millegranum.") We are referring Calkins's (1896) report of *L. chloromelum* here inasmuch as *L. chloromelum* (Ach.) Nyl. is now considered to be confined to the outer coastal plain of the southeastern United States. His mention of apothecia is disturbing, however, inasmuch as fruiting structures are rare on *L.*

milligranum. Calkins described his plant as: "*Thallus small to large; orbiculate, rigid; plumbeo-virescent, lobate, plicate, rugose; apothecia medium size, lecanorine, plane, rufous, the thalline margin granulate. Spores ovoid . . . On elms . . . The varieties are found further south.*"

Cook, Will

LEPTORHAPHIS Körb. NAETROCYMBACEAE [Photobiont: unknown, though ascomata sometimes associated with *Trentepohlia*. Gr. *leptos*, peeled, slender, thin, weak + *rhaphis*, a needle, pin; from the acicular spores. ~ Thallus crustose, endophloedeal, white or sordid; perithecia partly immersed; pseudoparaphyses largely unbranched, not anastomosing, the hamathecium not inspersed; spores 4–8, hyaline, fusiform to bacilliform, often curved, 3–7 septate.]

1. Spores with pointed ends; restricted to *Betula*.. . . . . L. EPIDERMIDIS
1. Spores with blunt ends; restricted to *Populus*. . . . . L. ATOMARIA

Leptorhaphis atomaria (Ach.) Szatala (L. *atomarius*, covered with atoms or spots; from the bespeckled appearance caused by the numerous black perithecia on the white thallus) Two records for this species are known from *Populus deltoides* along the edge of a cultivated field; the other is from a planted specimen of *Populus maximowiczii* at the Morton Arboretum. ~ Perithecia appearing circular; spores 24–28 μm × 2.5–3.5 μm.

DuPage-MOR, Kane-MOR

Leptorhaphis epidermidis (Ach.) Th. Fr. (Gr. *epi*, on, over + *derma*, skin, leather; probably in reference to its inhabitance of the outer papery bark of birch) = *Sagedia oxyspora* of Calkins, who reported this species from *Betula papyrifera* along the lake shore near Glencoe; he noted further that the "few native birch will soon disappear and with them this species." There are still a couple of trees in the ravine near Fort Sheridan, and we have searched them in vain for fertile pyrenocarps. ~ Perithecia appearing oval, a little longer than wide; spores 25–35 μm × 2.0–3.5 μm.

Cook-CACS,FH

LETHARIA (Th. Fr.) Zahlbr. PARMELIACEAE [Photobiont: *Trebouxia.* L. *lethale*, lethal, deadly; presumably after its effect on foxes, as implied in the name of the type species, *Letharia vulpina*. ~ Thallus deep yellow, fruticose, much branched, the branches irregularly ridged and pitted, not hollow; apothecia lecanorine, the disks brown; spores 8, simple, hyaline, ellipsoid.]

Letharia columbiana (Nutt.) J. W. Thomson (L. of Columbia) Our only record for this species is based upon a collection (Higginson *s.n.*, F) made in "Chicago, Illinois" in 1894. One cannot help but wonder if there was a label mix up somewhere along the line. The herbarium of Storrow Higginson included specimens from the Pacific Northwest at the Chicago Natural History Museum. [atranorin, vulpinic acid]

Cook-F

LICHENOTHELIA D. Hawksw. LICHENOTHELIACEAE [Photobiont unknown. Gr. *leichen*, a lichen + *thele*, nipple; a peritheciate lichen. ~ Thallus crustose, saxicolous, extremely thin but evidently epilithic; perithecia rare; spores 1–3 septate to submuriform.]

Lichenothelia scopularia (Nyl.) D. Hawksw. (L. *scopulus*, rugged rock or cliff + *-aria*, of or pertaining to) Our only collections of this species are from a granitic boulders, commonly shaded. *Lichenothelia* remains a poorly understood genus, largely because so many specimens, including all of ours are sterile. ~ The thallus is composed of compacted, pseudoparenchymatous brown cells 5–9 μm in diameter, which form a black stain on shaded or moist rock. Locally we have seen only green algae associated with it—if not actually hook up with it. Hawksworth (1981) discusses two species: *L. metzleri* (Lahm) D. Hawksw., with mainly 1-septate spores 21–24 *μm* long × 9–11 μm wide, and *L. scopularia* (Nyl.) D. Hawksworth, with mainly 3-septate spores 14–18 μm long and mostly less than 10 μm wide. The former is unknown from the eastern United States; there are several others in the North America, evidently restricted to California.

Cook-MOR, DuPage-MOR, Kane-MOR, Livingston-MOR, McHenry-MOR, Will-MOR

LICHINACEAE

A. Thallus squamulose or fruticose.
  B. Thallus brown, squamulose; photobiont *Nostoc*. . . . . **Heppia**
  B. Thallus not brown, more or less fruticose; photobiont not *Nostoc*.
    Thallus fruticose, the lobes long and strap-like; usually pruinose; photobiont *Chroococcus*. . **Thyrea**
    Thallus more or less umbilicate, the lobes about as long as broad; usually epruinose; photobiont *Xanthocapsa*. . . . . **Lichinella**
A. Thallus crustose
  C. Thallus sterile, thin, the photobiont unknown. . . . . **Lichenothelia**
  C. Thallus fertile; photobiont evident.
    D. Paraphyses absent; photobiont with a reddish, K+purple sheath; photobiont cyanobacterial, with a reddish sheath
      Apothecia 1-3 per areole.. . . . . **Cryptothele**
      Apothecia 1 per areole. . . . . **Pyrenopsis**
    D. Paraphyses present, branches; photobiont with yellowish, K- sheaths; photobiont ***Chroococcidiopsis***.
      Proper exciple rather evident between the thallus and the hymenium; disk brownish, not particularly reddish. . . . . **Pyrenocarpon**
      Proper exciple absent or inconspicuous; the disk with tinctures of red. . . . . **Psorotichia**

LICHINELLA Nyl. LICHINACEAE [Photobiont: *Xanthocapsa.* L. *Lichina*, a genus largely of tidewater rocks, considered by Agardh to be a lichenose alga, + *-ella*, diminutive; evocative of a little *Lichina*. Thallus gelatinous, fruticose, the lobes commonly thickened at the margins; apothecia immersed; spores 16-32, hyaline, simple, broadly ellipsoid.]

1. Lobes flat, to 2.5 mm broad, the older one granulose on the surface; more or less fruticose. . . . L. NIGRITELLA
1. Lobes notably convex, the larger more than 2.5 mm broad, not granulose on the surface; umbilicate. . . . . .
.. . . . . L. CRIBELLIFERA

Lichinella cribellifera Nyl, P. P. Morena & Egea (L. *cribellu*m, a small sieve + *fero*, to bear; the allusion obscure) = *Gonohymenia cribellifera* Henssen. Our only record for this species is a Calkins specimen from LaSalle County, which was determined by Wetmore. ~ Apothecia imbedded in the thallus, appearing at the surface as globular swellings; spores 16-32 per ascus, 6–8 μm × 3–4 μm.

LaSalle-F,MOR

Lichinella nigritella (Lettau) P. P. Morena & Egea (L. *nigritus*, blackened + *ellus*, diminutive; from the tiny blackened thalli) = *Gonohymenia nigritella* (Lettau) Henssen. Our only specimen is from a shaded, argillaceous, silty dolomitic bluff of the Des Plaines River, south of Darrien. ~ Apothecia imbedded in the thallus, appearing at the surface as globular swellings; spores 16-24 per ascus, 6–9 μm × 2.5–5 μm.

DuPage-MOR

LITHOTHELIUM Müll.Arg. PYRENULACEAE [Photobiont: *Trentepohlia.* Gr. *lithos*, stone + *thele,* a nipple; probably from the hard, carbonaceous perithecia. ~ Thallus crustose, thinly disposed, grayish to greenish; perithecia more or less immersed, somewhat carbonaceous, the ostioles asymmetrical disposed; Spores 4–8, hyaline to brown, 3–7 septate, more or less fusiform.]

1. Spores colorless, 3-septate; on *Acer saccharum*.. . . . . L. HYALOSPORUM
1. Spores dark brown, 7-septate; usually on *Fraxinus*. . . . . L. SEPTEMSEPTATUM

Lithothelium hyalosporum (Nyl.) Aptroot (Gr. *hyaleos*, glassy + *spora*, seed; from the colorless spores) = *Plagiocarpa hyalospora* (Nyl.) R. C. Harris. Harris (1973) cited a specimen he collected at Warren Woods, presumably in beech-maple woods. ~ Spores with the central cells larger than the tip; spores hyaline, 18–29 μm × 7–12 μm.

Berrien-MSC, Cook-MICH

Lithothelium septemseptatum ®. C. Harris) Aptroot (L. *septem*, seven + *saeptum*, wall, hedge, partition + *-atus*, adjective ending; from the 7-septate spores) = *Plagiocarpa septemseptata* R. C. Harris. Harris (1973) cited a specimen he collected at Warren Woods, presumably in beech-maple woods; his Cass County specimen is from "maple." *Lithothelium phaeosporum* R. C. Harris) Aptroot (Gr. *phaios*, dusky, dark gray + *spora*, seed) with only 4-celled, dark brown spores, is known from districts all around the Southern Lake Michigan Region, where it has been collected on *Fraxinus*. ~ Spores 8, brown outside the ascus, 30–42 μm × 12–16 μm.

Berrien-MSC, Cass-MSC,

LOBARIA Schreb. LOBARIACEAE [Photobiont: *Nostoc* or *Scytonema* or green and *Trebouxia*-like or *Myrmecia* (*Dictyochloropsis*). L. *lobus*, a lobe + *-arius*, belong

to; from the notably lobed thalli. ~ Thallus foliose, broad-lobed, commonly with cephalodia; lower surface tan, usually with a brownish tomentum or sparse indument of hairs; apothecia, if present, on the upper surfaces or margins lecanorine, the disks brown; spores 8, hyaline to brownish, 1–3 septate, fusiform)

1. Upper surface of lobes conspicuously foveolate-ridged; apothecia marginal; medulla C–. . . . L. PULMONARIA
1. Upper surface of lobes smooth; apothecia laminal; medulla C+ pink. . . . . L. QUERCIZANS

Lobaria pulmonaria (L.) Hoffm. (L. *pulmo*, lung +*aria*, like or connected with; evocative of the alveolate reticulation of the lobes. Our only record for this species locally is from an historic collection made in Milwaukee County (Lapham #50, NY). ~ Thallus containing *Myrmecia*, sorediate with tiny soralia along the lobe margins and the crests of the ridges of the foveolate upper surface; cephalodia tiny usually evident on the lower surface, bearing cyanobacterial photobiont; apothecia rather rare, associated with the lobe margins. [stictic and norstictic acid]

Milwaukee-NY

Lobaria quercizans Michx. (*Quercus* + L. *-izans*, resembling; from its supposed similarity to oak leaves) = *Sticta quercizans* Michx. Calkins & Huett (1898) cited this species from an oak tree at Deer Park in La Salle County. There is an old record from Ottawa County. ~ Thallus with a green photobiont, gray, not foveolate, wrinkled in age, without diaspores; apothecia common, the disks reddish-brown, evenly margined; cephalodia infrequent, internal, seen as low bumps on the lower surface. [gyrophoric acid, atranorin]

LaSalle, Ottawa-F

LOBARIACEAE

1. Thallus foliose. . . . . **Lobaria**
1. Thallus fruticose. . . . . **Dendriscocaulon**

LOXOSPORA A. Massal. OPHIOPARMACEAE [Photobiont: *Trebouxia*. Gr. *loxo*, oblique + *spora*, seed; from the twisted and curved spores of some species. ~ Thallus crustose, thin to thick, gray to yellowish gray, often with a fibrous or web-like prothallus; apothecia, if present, lecanorine, the disks brown or pruinose; spores 8, hyaline, 3–7 septate, fusiform, characteristically curved and twisted; thamnolic acid.]

Loxospora pustulata (Brodo & W. L. Culb.) R. C. Harris (L. *pustulatus*, blistered; from the hollow, isidioid warts) Yet unknown from the Southern Lake Michigan Region, this species is rather frequent in remnant wooded areas farther south and is known from as nearby as Warren County, Indiana. [thamnolic acid, ± atranorin, ± elatinic acid, ± squamatic acid]

MEGASPORA A. Massal. MEGASPORACEAE [Photobiont: Chlorococcoid.

Gr. *mega*, large + *spora*, seed. ~ Thallus crustose, muscicolous, continuous; apothecia subimmersed, the disk black; tholus IKI+ pale blue; spores 8, simple.]

Megaspora verrucosa (Ach.) Hafellner & V. Wirth (L. *verrucosus*, more warty) Yet unknown from our region, this species is rather frequent just north and west of us. ~ Thallus grayish or whitish, notably verrucose; disk concave, appearing ostiolate initially, eventually with a pale thalloid rim; spores 30–65 *µm* × 16–36 *µ*m.

MEGASPORACEAE

1. Thallus muscicolous; spores mostly more than 30 *µm* long. . . . . **Megaspora**
1. Thallus saxicolous; spores to 30 *µm* long.
   Thallus K–; spores subglobose, prevailingly more than 15 *µ*m wide. . . . . **Circinaria**
   Thallus K+ yellow or yellow turning red; spores ellipsoid, to 15 *µ*m wide. . . . . **Aspicilia**

MELANELIXIA O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch PARMELIACEAE [Photobiont: *Trebouxia.* Gr. *melaina*, black, or more literally a root of the genus *Melanelia* + Elix, in honor of the Australian lichenologist, John Alan Elix, 1941– , student of the Parmeliaceae and secondary metabolites) ~ Thallus foliose, brown to olivaceous, without pseudocyphellae, the upper cortex with tiny pores; apothecia, if present, lecanorine; spores usually 8, hyaline, simple; lecanoric or gyrophoric acids.]

Melanelixia subaurifera (Nyl.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch (L. *sub-* below, slightly, imperfectly, nearly + *auris*, ear + *fero*, to bear; from its ear-like appearance) = *Parmelia subaurifera* Nyl. = *Melanelia subaurifera* (Nyl.) Essl. There is a McHenry County specimen at ILL (Willey #48) named *Parmelia olivacea*; it is referable here. It is probable that Berry's (1941) report of the same species from Racine County is based upon a misidentification of *Melanelixia subaurifera*, particularly since he did not report this more common subsorediate species from the Southern Lake Michigan region. This lichen occurs on a wide variety of corticolous substrates locally including *Acer saccharinum, Carya cordiformis, Cephalanthus occidentalis, Fraxinus americana, Gleditsia triacanthos, Quercus alba, Quercus macrocarpa, Prunus americana, Rhus typhina*, and *Salix*. ~ This species is characterized by tiny, much aggregated, unbranched isidia that break down into granular soredia. [lecanoric acid, subauriferin]

Allegan-MSC, Barry-MSC, Calhoun-MSC, Cook-MOR, DeKalb-MOR, DuPage-MOR, Kenosha-MOR, Kent-F, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-F, McHenry-MOR, Ogle-MOR, Ottawa-MSC, Porter-MIN, Racine-MOR, St. Joseph In-MOR, Walworth-MOR, Waukesha-MOR,WIS, Will-MOR, Winnebago-MOR

MELANOHALEA O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch PARMELIACEAE [Photobiont: *Trebouxia.* Gr. *melaina*, black, or more literally a root of the genus *Melanelia* + Hale, in honor of the American lichenologist and educator, Mason Ellsworth Hale, 1929-1990, prolific student

of the Parmeliaceae and creative observer of secondary metabolites) ~ Thallus foliose, brown to olivaceous, the lobes flat, typically with pseudocyphellae on the isidia tips or warts, without tiny pores; apothecia, if present, lecanorine; spores 8, hyaline, simple. [± fumarprotocetraric acid, otherwise lacking secondary metabolites.]

Melanohalea septentrionalis (Lynge) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch (L. *septentrionalis*, of the north region) = *Parmelia septentrionalis* Lynge; *Melanelia septentrionalis* (Lynge) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch. Our only record for this species is from the bark of *Carya ovata*. ~ This species is without diaspores, the apothecia robust and aggregated, the disks lustrous yellowish-brown. [fumarprotocetraric acid]

Waukesha-WIS

MICAREA Fr. PILOCARPACEAE [Photobiont: green, often of paired cells. L. *mica*, a crumb, morsel + *area*, a space; perhaps from the scattered appearance of the tiny apothecia over the area of the thallus. ~ Thallus crustose, smooth to granular, grayish to olivaceous to sordid or endophloedeal; apothecia biatorine, convex, gregarious, the disks pale to nigrescent; paraphyses branched; spores 8, hyaline, simple or septate; apex of ascus amyloid, particularly the axial tube.]

1. Spores 3-septate; thallus C+ red. . . . . M. PELIOCARPA
2. Spores 0–1 septate; thallus C–. . . . . M. BYSSACEA

Micarea byssacea (Th. Fr.) Czarnota, Guzow-Krzemińska & Coppins (Gr. *bussos*, flax or linen fibers + *-aceus*, of or pertaining to; the allusion here unclear) Our records are all from weathered lignin. Until recently, this species has been considered *M. prasina* Fr. (L. prasinus, leek green; from the usually greenish color of the thallus) by local authors. Recent studies by Vidi Konoreva & Chesnokov (personal communication), however, have shown that all of our Midwestern specimens have methoxymicareic acid; *M. prasina* has been shown to produce micareic acid. Another species reported from the Midwest, *Micarea micrococca* (Körb.) Coppins (Gr. *micros*, small + *coccos*, berry; probably from the small pale goniocysts), also has methoxymicareic acid; its spores are mostly 10–12 μm long × 3–4.5 μm wide. Methoxymicareic acid reacts UV+ orange under the long-wave, while micareic acid reacts UV+ blueish. Another species, *M. misella* (Nyl.) Hedl. (L. *misellus*, little poor or wretched one; evidently from its scanty thallus), is similar morphologically but has a thin, non-granular, mostly immersed thallus and is known from decorticate *Juniperus*. ~ Thallus notably granular and at least partly epiphloedeal; hypothecium hyaline; spores 8–12 μm long × 2.7–3.5 μm wide. [methoxymicareic acid]

Berrien-MOR, DuPage-MOR, Porter-MIN

Micarea peliocarpa (Anzi) Coppins & R. Sant. (Gr. *pelios*, dark or olive gray + *karpos*, fruit;

from the gray apothecia) Yet unknown from the Southern Lake Michigan region, this species is recorded from districts ambient to the region, where it grows on siliceous rocks and on mosses over siliceous rocks. ~ Hypothecium is hyaline, the hamathecium reacts C+ red; spores 14–20 μm long × 3.5–5.5 μm wide. Compare with *Placynthiella icmalea*, which has a pale brown hypothecium. [gyrophoric acid, 5-*0*-methylhiascic acid]

MICROPELTIDACEAE

One local genus. . . . . **Mycoglaena**

MONOBLASTIACEAE

A. Ascospores strictly uniseriate in the ascus, more than 25 μm long. . . . . **Acrocordia**
A. Ascospores often not strictly uniseriate in the ascus, less than 25 μm long. . . . . **Anisomeridium**

MUELLERELLA Müll. Arg VERRUCARIACEAE [Parasitic in the apothecia of Teloschistaceous lichens. Literally, *Muellera*, a Fabaceous genus + -ella, diminutive; the illusion nonsensical, probably in honor of the German botanist, Ferdinand von Mueller, 1825-1896; more than likely it was an awkward attempt by Johann Hepp, 30 years his senior, to honor the Swiss lichenologist, Johannes Müller Argoviensis, 1828-1896, in 1862; the latter being a rather young man and the younger of the two Müllers may be the reason for the diminutive suffix. ~ Thallus parasitic in apothecia; perithecia globose to pyriform, evident but immerse, the wall brown, the lower portion grayish brown; asci clavate, with more than 64 spores; spores brownish or grayish, not hyaline, mostly 1-septate, broadly ellipsoid.

Muellerella lichenicola (Hepp ex Müll. Arg.) D. Hawksw. (L. lichen + -cola, inhabiting; from its parasitic association with lichens.) Generally not infrequent in the Midwest, although our nearest record is Carroll County, Illinois, where it was collected in the apothecia of *Gyalolechia flavovirescens*. ~ Asci clavate to broadly clavate, 50–65 μm × 14–20 μm, the spores 4.5–7.0 μm × 2.5–3.5 μm.

MYCOBILIMBIA Rehm LECIDEACEA [Photobiont: green. Gr. *mykes*, fungus + L. *bi*, double + *limbus*, in reference to the perispore; perhaps its appearance as a fungus. ~ Thallus muscicolous; apothecia brown to nigrescent; hypothecium dark; spores narrowly fusiform; 8, hyaline, 0–3 septate; tholus uniformly weakly amyloid; *Lecidea*-type.]

Mycobilimbia tetramera (De Not.) Haffelner & Türk () Yet unknown locally this species is rather frequent just north of our region, where it occurs on mosses, organic-rich soil, and decayed wood. A little east of our region one may encounter *Mycobilimbia berengeriana* (A. Massal.) Haffelner & V. Wirth, which is similar but the spores are only 2-celled. *M. tetramera* is evocative of *Bilimbia sabuletorum*, but has flatter apothecia. ~ Spores 3-septate, 16–34 μm ×

6–8 μm.

MYCOCALICIACEAE

1. Thallus fungicolous; spores septate. . . . . **Phaeocalicium**
1. Thallus corticolous or lignicolous; spores simple.
   Thallus from *Quercus* bark.. . . . . **Mycocalicium**
   Thallus from cortical *Rhus* exudate.. . . . . **Chaenothecopsis**

MYCOCALICIUM Vainio MYCOCALICIACEAE [Photobiont: absent. Gr. *mykes,* a fungus + *kalyx,* a cup; the allusion unclear to me. ~ Thallus crustose, the apothecia nigrescent, stipitate; hamathecium not forming a mazaedium but the asci disintegrating at maturity; spores 8, brownish, simple; conidia short, curved.]

Mycocalicium subtile (Pers.) Szatala (L. *subtilis,* fine, thin, delicate; from the fragile stipes of the apothecia) Yet unknown from the Southern Lake Michigan Region, it occurs in districts all around, and is known from as nearby as Warren County, Indiana, where it was collected on *Quercus rubra*. Much scarcer, but also in the vicinity is *Mycocalicium albonigrum* (Nyl.) Fink (L. *albus*, white + *nigrum*, black; perhaps from the contrasting black-stiped apothecia and pale thallus), which differs in having very large isodiametric cells in the exciple (ca. 10 μm across), those of *M. subtile* being notably smaller. ~ Asci linear-cylindric, the spores, uniseriate, dark brown, 7.0–8.0 μm × 3.5–4 μm.

MYCOGLAENA Höhnel MICROPELTIDACEAE [Photobiont: absent. Gr. *mykes,* a fungus + *glenos,* the eyeball; probably from the perithecia, which have the appearance of a black pupil surrounded by a blue-green iris, after the manner of an eye. ~ Thallus crustose, corticolous, pale; perithecia with blue-green walls, the asci truncate distally; paraphyses rather thick, weakly to notably branched, typically truncate at the apex; spores hyaline, without a perispore, 8, 3–5 septate to 0–1 muriform.]

Mycoglaena meridionalis (Zahlbr.) Szatala (L. *meridionalis,* southern, or of a meridian; probably from the longitudinal septum, which distinguishes it from other merely septate species, though it also has a generally more southern distribution) Known from districts all around the Southern Lake Michigan region, our only local specimen is from DuPage County, where it grew on *Prunus serotina.* Elsewhere is grows commonly on *Gleditsia triacanthos*. ~ Spores submuriform. A rare Midwestern species yet unknown locally, *Mycoglaena quercicola* R. C. Harris (L. *Quercus* + *-cola*; inhabiting oaks) has 3–5 septate, non-muriform spores and is confined to oaks. ~ Spores elliptical, muriform, 18–26 μm × 8–10 μm.

DuPage-MOR

MYCOPORACEAE

One local genus. . . . . **Mycoporum**

MYCOPORUM Nyl. MYCOPORACEAE [Photobiont: absent. Gr. *mykes,* a fungus + *poros,* callus; from the callus-like clusters of fungal ascomata. ~ Thallus crustose, endophloedeal, sordid; pores large, 8, hyaline to brown, septate to muriform.]

1. Spores 1-septate, hyaline. . . . . M. ESCHWEILERI
1. Spores 7–9 septate, hyaline to brown. . . . . M. COMPOSITUM

Mycoporum compositum (A. Massal.) R. C. Harris (L. *compositus,* put together, united; from the aggregated ascomata) = *M. pycnocarpum* Nyl. Harris (1973) mapped this species from just south and east of the Southern Lake Michigan region, collected most commonly on *Acer rubrum.* ~ Spores muriform, brown, 30–38 μm × 12–17 μm.

Mycoporum eschweileri (Müll. Arg.) R. C. Harris (in honor of the German botanist and physician, Franz Gerard Eschweiler, 1796-1831, author of *Systema Lichenum*) = *Tomasellia eschweileri* (Müll. Arg.) R. C. Harris. Our only record for this species is one identified by R. C. Harris at NY (Calkins #181), which had been distributed as *Arthonia taediosa*; it said to have occurred on oak. ~ Spores 2–celled or rarely 4–celled, 17–20 μm × 5–6 μm, irregularly disposed in the asci, narrowly elliptic, not much contracted at the septum.

LaSalle-NY

MYELOCHROA (Asah.) Elix & Hale PARMELIACEAE [Photobiont: *Trebouxia.* Gr. *myelos*, marrow + *chroa*, superficial color; from the yellow-tinted medulla. ~ Thallus foliose, largely adnate, pale gray or bluish-gray; lower cortex black with a brown marginal zone, rhizines densely disposed, simple or branched; apothecia, if present, lecanorine, concave initially, flat in age; spores 8, hyaline, simple, ellipsoid.]

1. Thallus isidiate, usually saxicolous. . . . . M. OBSESSA
1. Thallus not isidiate, corticolous
   Thallus sorediate; apothecia very rare. . . . . M. AURULENTA
   Thallus esorediate; apothecia common. . . . . M. GALBINA

Myelochroa aurulenta (Tuck.) Elix & Hale (L. *aurum*, gold + *oulos*, woolly, curly + *entos*, within, inside; from the yellow medulla) = *Parmelina aurulenta* (Tuck.) Hale. Hale (1958) mapped this species from extreme southeastern Wisconsin as *Parmelia aurulenta* Tuck., but he does not cite specimens. Occasional, this species grows on a variety of open-grown trees or the upper trunks of forest-grown trees; we also have a specimen from shaded wooden roof shingles. ~ The otherwise white medulla is characteristically pale yellow beneath the soredia; soredia laminal, often coalescing; apothecia and pycnidia rare. [atranorin, ± zeorin]

Berrien-MOR, Cass-MSC, Cook-MOR, DeKalb-MOR, DuPage-MOR, Jasper-MOR, Jefferson-WIS, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake Il-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Newton-MOR, Rock-WIS, Starke-US, Walworth-MOR, Will-MOR, Winnebago-MOR

Myelochroa galbina (Ach.) Elix & Hale (L. *galbinus*, yellowish; from the color of the medulla) = *Parmelia tiliacea; P. tiliacea* var. *sulphurosa* of Calkins; *Parmelina galbina* (Ach.) Hale. Calkins's report may be referable to *Myelochroa aurulenta*, which species was not treated by Calkins; his text, in fact, implied that apothecia were present. Berry (1941) restricted the var. *sulphurosa* to Louisiana and Florida, though we now have specimens from as far north as central Illinois, and there is a specimen, collected by Willey in 1883, at ILL (called *Parmelia tiliacea*) from McHenry County. The Rock County record is from the bark of *Prunus serotina*. The Lake County, Illinois specimen is from an oak at Lake Bluff; the DuPage County specimen is from the cortex of an old *Rhus typhina*. Farther south, this species is characteristic of canopy branches rather than the boles of trees. ~ Thallus pale gray; apothecia abundant; medulla white but with regular tinctures of pale yellow, particularly beneath the apothecia; pycnidia common. [galbinic acid, atranorin, zeorin]

Cook-CACS,NY, DuPage-MOR, Lake Il-F, McHenry-ILL, Rock-WIS

Myelochroa obsessa (Ach.) Elix & Hale (L., *obsessus*, remain, grip firmly; perhaps from its rather tight adherence to the substrate.) = *Parmelina obsessa* (Ach.) Hale. Yet unknown locally, it grows as nearby as Iowa County, Wisconsin, on shaded St. Peters Sandstone. There is a specimen, so named, from Berrien County, Michigan (ASU 535086), but it unlikely to be this species; the substrate is given as *Quercus rubra*. ~ Thallus gray, often sordid near the margins, the lobes rarely more than 1 mm broad, abundantly isidiate, the medulla white with tinctures of yellow. [secalonic and galbinic acids]

MYRIOLECIS Clements LECANORACEAE [Photobiont: *Trebouxia*, Chlorococcoid. Gr. *myrio-*, countless + lekis, dish, pot, or urn, from the numerous scattered apothecia over the substrate. ~ Thallus, in ours, not or only scarcely evident; apothecia lecanorine, the rims much paler than the brown to nigrescent disks; paraphyses filiform, at least sparsely branched and anastomosing; ascus tips amyloid, I+; spores 4–32, hyaline, simple.]

1. Thallus saxicolous.
   - Apothecia and/or the margins pruinose, the disks C+ yellow or orange. . . . . M. SEMIPALLIDA
   - Apothecia and margins without pruina, the disks C– . . . . . M. DISPERSA

1. Thallus not saxicolous.
   - Apothecia polysporous. . . . . M. SAMBUCI
   - Apothecia 8-spores. . . . . M. HAGENII

Myriolecis dispersa (Pers.) Sliwa, Zhao Xin & Lumbsch (L. *dispersus*, scattered; from the numerous, but often remote apothecia) = *Lecanora dispersa* (Pers.) Sommerf. This species is the common associate of *Endocarpon petrolepideum*, *Xanthocarpia crenulatella* and *X. feracissima* on limestone, flagstone, and weathered concrete; it is rare on siliceous rock. Calkins included this species with what called *L. hagenii*. ~ Spores 8 per ascus, ellipsoid, 8–11 μm × 5–6 μm. [β-

sitosterol]

Barry-MICH, Benton-MOR, Berrien-MOR, Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Koskiusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MIN, LaSalle-MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Porter-MIN,MOR, Racine-MOR, Rock-MOR, St. Joseph IN-MOR, Starke-MOR, Steuben-MOR, Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Myriolecis hagenii (Ach.) Sliwa, Zhao Xin & Lumbsch (after Mark Gottfried Hagen, 1749–1829, Prussian botanist and pharmacist) = *Lecanora hagenii* (Ach.) Ach. Rather frequent on weathered lignin. ~ Spores 8 per ascus, ellipsoid, 9–13 μm × 5–6 μm. [no substances]

Benton-MOR, Cook-MOR, DuPage-MOR, Grundy-MOR, Kosciusko-MOR, Lake Il-MOR, Lake In-MIN,MOR, LaPorte-MOR, Noble-MOR, Porter-INDU,MIN, Racine-MOR, Starke-MOR, Steuben-MOR, White-MOR, Will-MOR

Myriolecis sambuci (Pers.) Clements (L. Of the genus *Sambucus*; from it supposed inhabitance on elderberry) = *Lecanora sambuci* (Pers.) Nul. *L. hageni* var. *sambuci* of Calkins (1896), who listed this species as rare on elms and poplars in Will County. The Allegan County record is from *Populus*; the Barry County records are from *Populus tremuloides*, as are the specimens from Illinois Beach State Park. ~ Spores 12–32 per ascus, ovoid, 6–9 μm × 4–7 μm. [no substances]

Allegan-MSC, Barry-MSC, DeKalb-MOR, Lake Il-MOR, Racine-MOR,

Myriolecis semipallida H. Magn. (L. *semi-*, half + *pallidus*, white or pale) Our only record is from a shaded cliff face near Lemont, with *Flavoplaca citrina*. ~ Spores 4–8 per ascus, ellipsoid, 8–13 μm × 5–7 μm. [5-chloro-3-*O*-methylnorlichexanthone]

Cook-MOR

NAETROCYMBACEAE

A. Ascospores nearly or quite as long as the ascus, filiform. . . . . **Leptorhaphis**
A. Ascospores notably shorter than the ascus, oblong. . . . . **Naetocymbe**

NAETROCYMBE Körber NAETROCYMBACEAE [Photobiont: absent. (Gr. *naetr-* ? + Gr. = *cymba*, boat or vessel. ~ Thallus crustose, endophloedeal; perithecia black, superficial, hyaline beneath, the pseudoparaphyses unbranched but slimy and ambiguously evident; spores hyaline, mostly 2-celled.]

Naetrocymbe punctiformis (Pers.) R. C. Harris (L. *punctum,* a prick, puncture, or dot + *-formis,* denoting taking the shape of; from the appearance of the tiny perithecia as little dots) = *Pyrenula punctiformis auct; Arthopyrenia padi* Rabenh; *Santessoniolichen punctiforme* (Pers.) Tomas & Cif. Our only record of this species is a specimen (Calkins #211, NY), originally named *Pyrenula analepta,* from Elgin, Illinois, where it was collected "on shrubs." ~ Spores 8, irregularly arranged in the pyriform ascus, clavate, 18–22 μm × 5–6 μm, with a thin gelatinous sheath.

Kane-NY

OCHROLECHIA A. Massal. OCHROLECHIACEAE [Photobiont: Chlorococcoid. Gr. *ochros,* pale, sallow + *lechos,* couch, bed, nest; probably from the cushion-like apothecia. ~ Thallus crustose, well-developed, white or pale gray; apothecia usually present (but not in ours), lecanorine; spores 8, very large, hyaline, simple; conidia cylindrical.]

Ochrolechia arborea (Kreyer) Almb. (L. *arboreus,* of trees; from its habitat) The only Southern Lake Michigan region records for this species were collected on open-grown specimens of *Cornus racemosa, Populus tremuloides, Prunus serotina, Quercus macrocarpa, Q. velutina*, *Rhus typhina*, and *Ulmus americana*. the former in a dry, gravel-filled glacial crevice near Harmony Hills, the other in savanna at Illinois Beach State Park. One can infer from the distribution map in Brodo (1991), that it is frequent just north of the Southern Lake Michigan region, with a few disjunct records in the southern Appalachians. We also have a few records from southern Illinois. ~ Thallus pale gray, thinning at the edges, the soredia in discrete soralia, C+ red, the medulla UV + vivid yellow orange. [lichexanthone, lecanoric acid, gyrophoric acid]

Allegan-MOR,MSC, Calhoun-MSC, DuPage-MOR, LaGrange-MOR, Lake Il-MOR, Walworth-MOR

OCHROLECHIACEAE

One local genus. . . . . **Ochrolechia**

OPEGRAPHA Ach. OPEGRAPHIDACEAE [Photobiont: *Trentepohlia.* Gr. *ope,* a hole, chink, opening + *graphis*, of line drawings; from the partly open apothecia, rather than closed as in *Graphis*, which see. ~ Thallus crustose, corticolous or lichenicolous; apothecia often branched; spores mostly 8, hyaline to brown, 3–several septate.]

1. Spores 3-septate, becoming brown; thallus parasitic on *Willeya*. . . . . O. PULVINATA
1 Spores more than 3-septate, hyaline; thallus corticolous. . . . . O. VULGATA

Opegrapha pulvinata Rhem. (L. *pulvinatus*, like a cushion) Yet unknown from the Southern Lake Michigan Region, it this parasite is known from the thallus of *Willeya diffractella* as nearby as Carroll County, Illinois. ~ Ascomata aggregated into dense clusters to 4 mm or so across; spores 8, straight, hyaline to brownish, 4-celled, 19–25 μm × 6–7 μm.

Opegrapha vulgata Ach. (L. *vulgatus,* common; from a local ubiquity) There is a Calkins specimen of this corticolous species from La Salle County at the New York Botanical Garden. ~ Ascomata scattered to clustered, simple or forked to stellate; spores 8, straight or somewhat curved, hyaline, 5–9 celled, 19–35 μm × 2.5–4.5 μm.

LaSalle-NY

OPEGRAPHIDACEAE

One local genus. . . . . **Opegrapha**

OPHIOPARMACEAE

1. Thallus squamulose. . . . . **Hypocenomyce**
1. Thallus crustose. . . . . **Loxospora**

PARMELIA Ach. PARMELIACEAE [Photobiont: *Trebouxia.* Gr. *parme*, a small round shield or buckler + *-elia*, a generic ending, probably from Gr. *eilo*, to roll up or collect, as in a collection or group; perhaps from the large coterie of shield lichens known to Acharius. ~ Thallus foliose bluish-gray, adnate, the lobes rather truncate at the tips, commonly with white angular reticulations, which can develop into pseudocyphellae; lower cortex black, the rhizines usually branched or at least forked; apothecia lecanorine, rare; spores 8, hyaline, simple.]

1. Thallus sorediate. . . . . P. SULCATA
1. Thallus isidiate.
   All but the marginal rhizines squarrose branched, ... P. SQUARROSA
   Rhizines all unbranched or merely forked. . . . . P. SAXATILIS

Parmelia saxatilis (L.) Ach. (L. saxatilis, of rocks) Calkins (1896) reported this species from ". . . trees in Cook County near Elgin and on recent sandstones and boulders at Lemont." *Parmelia squarrosa* had not been named at that time, so the corticolous report may be referable to the same. There is, however, a specimen at ILL (Calkins LE-325*)* from Cook County called *Parmelia saxatilis* that is actually *P. sulcata*. His report from "sandstones and boulders" may represent *P. saxatilis*, since it is prevailingly a saxicolous species, *P. squarrosa* known rarely from rocky substrates. Hinds (1998) maps no specimens from the Southern Lake Michigan Region. [salazinic acid, atranorin]

Cook-ILL

Parmelia squarrosa Hale (L. *squarrosus*, rough with stiff scales, bracts, leaves, or processes; from rough appearance of the short-branched rhizines) Our only record for which we have seen specimens is from bark at Elson's Hill Forest Preserve and at Warren Dunes State Park. Hinds (1998) maps a record from northwestern Indiana. [salazinic acid, atranorin]

Berrien-MSC, DuPage-MOR

Parmelia sulcata Tayl. (L. *sulcus*, furrow, groove + *-atus*, provided with; from the lined markings on the upper cortex) = *Parmelia saxatilis* var. *sulcata* of Calkins. A common substrate, especially in our Indiana counties, is *Quercus velutina*, but it is frequent on a wide variety of trees, including cultivated specimens in suburbs. In 1991 at the Morton Arboretum, a blue-gray gnatcatcher built its nest in *Syringa reticulata* exclusively of *Parmelia sulcata* fragments—with the upper cortex comprising the outer surface . *Punctelia rudecta* is a similar foliose species common throughout the region, but it is usually found low on the trunks of large oaks where gnatcatchers are seldom seen. *Parmelia sulcata* grows more often on the upper surfaces of branches where gnatcatchers are more likely to forage. [salazinic acid, atranorin]

Allegan-MOR,MSC, Barry-MOR,MSC,WIS, Berrien-MOR, Boone-MOR, Branch-MICH, Calhoun-MSC, Cass-MOR, Cook-ILL,MOR-NY, DeKalb-MOR, DuPage-MOR, Ford-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kalamazoo-MSC, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR,MSC, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-ILL,MOR,NY, Lee-MOR, Marshall-MOR, McHenry-MOR,NY, Milwaukee-MOR, Newton-MOR, Ogle-MOR, Ottawa-MOR,MSC, Porter-INDU,MOR, Pulaski-MOR, Racine-MOR, Rock-MOR,WIS, St. Joseph IN-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR,WIS, Will-MOR, Winnebago-MOR

PARMELIACEAE

A. Thallus fruticose, with erect or pendent branches, generally originating from a single hold-fast.
  B. Thallus yellow-green.
    Fibrils evident; branches smoothly terete. . . . . **Usnea**
    Fibrils absent; branches irregularly wrinkled. . . . . **Evernia**
  B. Thallus brown or bright yellow.
    C. Thallus bright yellow [See also *Phacopsis*.]. . . . . **Letharia**
    C. Thallus brown.
      Thallus branches flattened and involute. . . . . **Cetraria**
      Thallus branches terete. . . . . **Bryoria**
A. Thallus foliose.
  D. Thallus with yellowish-green; usnic acid usually present.
    E. Thallus finely isidiate. . . . . **Xanthoparmelia**
    E. Thallus with granular or powdery soredia or pustular isidia.
      F. Lobes to 3 mm across.
        Soralia capitate; divaricatic acid present. . . . . **Parmeliopsis**
        Soralia not capitate; divaricatic acid absent. . . . . **Usnocetraria**
      F. Larger lobes more than 3 mm across.
        Medulla C+ red. . . . . **Flavopunctelia**
        Medulla C–. . . . . **Flavoparmelia**
  D. Thallus without tinctures of yellow; usnic acid absent.
    G. Thallus brown or brownish gray (rarely pale gray and umbilicate); cortex K–.
      H. Lobes erect or suffruticose.
        Thallus abundantly and conspicuously beset with granular pseudocyphellae. . . . . **Tuckermanella**
        Thallus with pseudocyphellae. . . . . **Tuckermannopsis**
      H. Lobes appressed.
        Thallus without isidia or soredia. . . . . **Melanohalea**
        Thallus isidiate, many of the isidia breaking down into soredia. . . . . **Melanelixia**
    G. Thallus mineral gray, whitish gray, or greenish gray, never umbilicate; cortex K+ yellow or K–.
      I. Lower cortex white, light tan, or absent.
        Upper cortex K+ pale yellow, commonly with small white pores. . . . . **Punctelia**
        Cortex K+ deep yellow, without pores. . . . . **Imshaugia**
      I. Lower cortex brown or black (occasionally pale near the margins).
        J. Medulla K–.
          K. Thallus sorediate
            Thallus lobes inflated, hollow. . . . . **Hypogymnia**
            Thallus lobes flat, not hollow. . . . . **Canoparmelia**
          K. Thallus esorediate; lobes solid.
            Medulla KC–; lower cortex with a thick tomentum; lobes appearing inflated. . . . . **Anzia**

Medulla KC+ rose; lobes flat, merely rhizinate.. . . . . **Hypotrachyna**

J. Medulla K+ yellow or red.

L. Lobes broad, usually 4 mm or more wide, typically with a rhizine-free zone near the margins; medulla K+ red. . . . . **Parmotrema**

L. Lobes narrower; rhizines typically distributed throughout on the lower surface; medulla K+ yellow or red.

M. Upper cortex without white markings; medulla pale but distinctly yellow near the soralia. . . . . **Myelochroa**

M.. Upper cortex reticulate or with distinct white markings, at least toward the lobe tips.

Upper cortex reticulate-alveolate; medulla K+ deep yellow, stictic acid. . . . . **Crespoa**

Upper cortex, not reticulate-alveolate, with distinct white markings; medulla K+ yellow to red, salazinic acid. . . . . **Parmelia**

PARMELIOPSIS (Stizenb.) Nyl. PARMELIACEAE [Photobiont: *Trebouxia.* *Parmelia* + Gr. *opsis*, aspect, view, appearance; a segregate of *Parmelia*, which see. ~ Thallus foliose, greenish gray, usually sorediate; apothecia rare, lecanorine; spores 8, hyaline, simple.]

Parmeliopsis ambigua (Wulfen) Nyl. (L. *ambiguus*, interchangeable, uncertain, doubtful; perhaps from an uncertainty as to its taxonomic position) The only record of this species is Calkins's *Lichenes Exsiccati* #88 at ILL. The specimen label states that it was collected on old fence rails in Cook County. [usnic acid, atranorin, divaricatic acid]

Cook-ILL

PARMOTREMA A. Massal. PARMELIACEAE [Photobiont: *Trebouxia.* L. *parma*, a small round shield + *trema*, a hole, especially the female pudendum; probably after the perforated apothecia of *Parmotrema perforatum*. ~ Thallus foliose, loosely adnate, the lobes broad and round, often with marginal cilia; lower cortex brown to black, becoming browner or even white at margins; rhizines largely unbranched, often absent or much reduced distally; apothecia, when present, lecanorine, concave, sometimes perforate, the disks brown; spores 8, hyaline, simple; pycnidia laminal, the conidia elongate bacilliform to filiform.]

1. Thallus without isidia or soredia.
   2. Medulla K-. . . . . P. SUBMARGINALE
   2. Medulla K+ red.
      Lower surface with a broad bare white zone near the margins. . . . . P. PERFORATUM
      Lower surface black or brown and mostly rhizinate to the margins. . . . . P. CETRATUM
1. Thallus with either isidia or soredia.
   3. Medulla C+ red.. . . . . P. AUSTROSINENSE
   3. Medulla C–.
      4. Thallus esorediate.

Medulla K+ yellow. . . . . P. CRINITUM
Medulla K+ yellow turning red. . . . . P. SUBTINCTORIUM

4. Thallus sorediate.
   5. Medulla K+ yellow; stictic acid present. . . . . P. PERLATUM
   5. Medulla K+ yellow turning red; stictic acid absent.
      6. Salazinic acid absent; lower cortex with white blotches or zones near the margins; upper cortex without cracks or maculae. . . . . P. HYPOTROPUM
      6. Salazinic acid present; lower cortex brown to black, without white blotches or zones near the margins; upper cortex often reticulate-cracked or maculate.

Lower cortex bearing at least short rhizines nearly or quite to the margins, rarely with more than 3 mm completely rhizine-free. . . . . P. RETICULATUM
Lower cortex free of rhizines in large areas near the margins, the bare zones mostly more than 3 mm. . . . . P. MARGARITATUM

Parmotrema austrosinense (Zahlbr.) Hale (L. *auster*, south, the wind out of the south + *Sinae*, the Chinese; from southern Asia) Our only local records for this species are from an open-grown *Fraxinus americana* on high dunes at Grand Marais, the twig of *Pinus banksiana* in a plantation, and *Pyrus calleryana* and *Quercus palustris* in parking lots, all of which places much disjunct from its otherwise Appalachian/Ozarks distribution. ~ The DuPage County specimen has protocetraric acid! [lecanoric acid, atranorin]

Berrien-MOR, Calhoun-MOR, DuPage-MOR, Kent-MOR, Marshall-MOR, Ottawa-MOR

Parmotrema cetratum (Ach.) Hale (L. *cetra*, a sort of leather shield + *-atus*, an adjective ending; from the form of the thallus) = *Parmelia cetrata* Ach., *R. cetrata* (Ach.) Hale & A. Fletcher. I would inclined to refer local reports of this species to *Parmotrema reticulatum*, which is similar in having a reticulate upper cortex, lacking only the soredia. How one would distinguish the two with a young thallus is difficult to say, except that P. cetratum is more like to have more laciniate lobes. We have numerous modern records from Missouri, but none as yet from Illinois. [salazinic acid, atranorin]

Cook-F, DuPage-MOR, Pulaski-MOR

Parmotrema crinitum (Ach.) M. Choisy (L. *crinitus*, with long hair; from the marginal cilia) = *Parmelia crinita* of Calkins. Most early reports of this species from Illinois are referable either to *Rimelia reticulata* or to *R. cetrata*, but Calkins (1896) described isidia on the Southern Lake Michigan region specimens, and reported this lichen from oaks in Hanover Township and on a detached rock near Lemont; Berry (1941) reports it from Walworth County. See also comments below under *Parmotrema margaritatum.* [stictic acid, atranorin]

Cook, Walworth-WIS

Parmotrema hypotropum (Nyl.) Hale (Gr. *hypo*, under, beneath, less than usual + *tropos*, a turn, turning, direction; probably from the often turned up lobes exposing the under surface) More common farther south, our records are from *Crataegus mollis, Fraxinus, Gleditsia triacanthos, Pinus strobus, Prunus serotina, Quercus palustris,* and weathered fence rails. [norstictic acid, atranorin]

Allegan-MOR, Benton-MOR, Berrien-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Fulton-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Lake Il-MOR, Marshall-MOR, McHenry-MOR, Ogle-MOR, Pulaski-MOR, Walworth-MOR,WIS, Will-MOR

Parmotrema margaritatum (Hue) Hale (Gr. *margarites,* pearl + *-atus,* provided with; probably from the appearance of the smooth white cortex) Our only contemporary records are from *Acer saccharinum* and *Quercus macrocarpa*. There is a Calkins specimen at the New York Botanical Garden, collected at Glencoe and called *Parmelia crinita*. It is esorediate except for one soralium. Had this soralium been overlooked, the specimen may well have been called either *P. despectum* or *P. eurysacum* (Hue) Hale., which are frequent farther south; the former has irregular, eciliate lobe margins, while the latter has rounded, ciliate lobe margins. If the maculae of the cortex are overlooked, *Rimelia reticulata,* which is sorediate, would key here. [salazinic acid, atranorin]

Benton-MOR, Cook-F,NY, Kenosha-MOR, McHenry-MOR

Parmotrema perforatum (Jacq.) A. Massal. (L. *perforatus*, perforated; from the perforated apothecia) = *Parmelia perforata* of Calkins. Modern records suggest that this species is now confined to districts farther south in Illinois. Calkins (1896) described the plant from the Southern Lake Michigan region and reported it as a common species on "various trees in Cook and Will counties." [norstictic acid, atranorin]

Cook, Will

Parmotrema perlatum (Huds.) M. Choisy (L. *perlatus*, carried, conveyed, presented) = *Parmotrema chinense* (Osbeck) Hale & Ahti. Our only records for this species are from Bourbon, Indiana, collected in 1889 and more recently in a Tamarack Bog near Goose Lake, Michigan. [stictic acid, atranorin]

Calhoun-MSC, Marshall-WIS

Parmotrema reticulatum (Tayl.) Hale (L. *reticulatus*, made like a net; from the connected cracks in the upper cortex) = *Rimelia reticulata* (Tayl.) Hale & A. Fletcher. Including Calkins's report of *Parmelia perlata*. Calkins (1896) report of *P. cetrata* must also be included here inasmuch as he described his specimens as having "sorediferous" lobes. Very common farther south, we have only a few modern records, all from different corticolous substrates as well as weathered fence rails. Calkins considered this species common in the Southern Lake Michigan region a century ago. [salazinic acid, atranorin]

Benton-MOR, Berrien-MOR, Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kent-MOR, Kosciusko-MOR, LaSalle-ILL, Lake-IN -MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Porter-MOR, Pulaski-MOR, Racine-MOR, Steuben-MOR, Waukesha-MOR, White-MOR,US, Will-MOR, Winnebago-MOR

Parmotrema submarginale (Michx.) DePriest & B. Hale (L. *sub*, under or close to + *marginalis*, of or pertaining to the edge or margin; I presume their once was a *Parmelia marginale*) Our only records for this species are from an old collection (Calkins s.n., F) made in LaSalle County and a contemporary collection (Kobal *s.n.*) from and open-grown tree of *Acer saccharinum*. [atranorin, protocetraric acid}

DuPage-MOR, LaSalle-MOR

Parmotrema subtinctorium (Zahl.) Hale (similar to *P. tinctorium*, L. *tinctorium*, used for dyeing) Our only record is from a decorticate tree branch along Grant Creek near Wilmington. [atranorin, norlobaridone, salazinic acid]

Will-MOR

PELTIGERA Willd. PELTIGERACEAE [Photobiont: *Nostoc* and *Coccomyxa.* L. *pelta*, small shield + *gero*, to carry, bear; apparently from the apothecia borne on the lobe margins. ~ Thallus foliose, brown or grayish, not at all adnate, the lower surface with a tight tomentum, usually veiny; apothecia on the lobes or substipitate on modified lobes, lecanorine, sometimes obscurely so, flat or convex , when present; spores acicular, 8, hyaline to brownish, 3–7 septate.]

1. Thallus usually with laminal soralia, less than 3 cm across and typically with strongly ascending lobes. . . . . P. DIDACTYLA
1. Thallus without soralia, usually broader and with mostly adnate or spreading-ascending lobes.
    2. Photobiont green; appressed, scale-like, cephalodia present and darker than the upper cortex.
        Lower surface distinctly marked by dark veins. . . . . P. APHTHOSA
        Lower surface lacking distinct veins. . . . . P. LEUCOPHLEBIA
    2. Photobiont blue-green; cephalodia absent.
        3. Thallus surfaces with cylindrical, peltate, or flattened isidia.
            Isidia clavate, globular to cylindrical, or more or less flattened. . . . . P. EVANSIANA
            Isidia scalelike or peltate. . . . . P. LEPIDOPHORA
        3. Upper surface without isidia, or with only marginal isidia or lobules.
            4. Upper cortex tomentose, at least near the margins.
                5. Thallus margins, and particularly the cracks in the cortex, lined with isidia or isidioid lobules (phyllidia). . . . . P. PRAETEXTATA
                5. Thallus margins and cracks entire, without or with only disparate phyllidia.
                    Rhizines simple, not tufted. . . . . P. PONOJENSIS
                    Rhizines prevailingly tufted, running together. . . . . P. RUFESCENS
            4. Upper cortex smooth to the margins.
                6. Thallus margins, and particularly the cracks in the cortex, lined with isidia or isidioid lobules . . . . . P. ELISABETHAE
                6. Thallus margins and cracks entire, without or with only disparate isidia.
                    7. Apothecia flat; rhizines in concentric arrays. . . . . P. HORIZONTALIS
                    7. Apothecia erect; rhizines not in concentric arrays.
                        Apothecia black; corticolous at tree bases. . . . . P. NECKERI
                        Apothecia brown; terricolous. . . . . P. POLYDACTYLON

Peltigera aphthosa (L.) Willd. (Gr. *aphthos*, with ulcers; presumably from the cephalodia) This species is known from as nearby as Ozaukee County, Wisconsin, where it was collected in a dense wet cedar swamp at east end of Huiras Lake. This species is usually notably larger than our other grass-green species, *P. Leucophlebia*.

Peltigera didactyla (With.) J. R. Laundon (Gr. *di*, two, double + *daktylos*, a finger, toe; apparently from the strongly ascending lobes) = *P. spuria* (Ach.) DC. Rare, this species is confined to stable shaded or moist sands in natural areas.

Allegan-MSC, Jasper-MOR, Kankakee-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR, Ogle-MOR, Porter-MOR, Will-MOR

Peltigera elisabethae Gyeln. (? A chivalrous commemoration of an acquaintance of

Gyelnik's) Rare just outside the Southern Lake Michigan region, particularly northward, we have seen no specimens locally. [tenuiorin, triterpenoids, zeorin, ± gyrophoric acid]

Peltigera evansiana Gyeln. (after Alexander William Evans, 1868–1959, American bryologist and lichenologist) Not uncommon just north of our region, our only records are from a Black Oak Savanna at Indiana Dunes State Park, in Porter County, under *Pinus strobus* in LaSalle County, and the base of a tree near Big Bend in Waukesha County.

LaSalle-MOR, Porter-MOR, Waukesha-WIS

Peltigera horizontalis (Gyel.) Trass (L. *horizontalis*, like the horizon, flat) Our only record for this species is based upon a collection (Imshaug 27392, MSC) collected at Warren Dunes State Park and on the sand dunes at Old Baldy near Saugatuck.

Allegan-MSC, Berrien-MSC

Peltigera lepidophora (Vain.) Bitter (Gr. *lepidos*, scale + *phoros*, a bearing; from the flattened, scalelike isidia) Our only records for this species are from a sandy interdunal prairie east of Ogden Dunes and from the dunes at Mount Baldhead near Saugatuck.

Allegan-MSC, Porter-MOR

Peltigera leucophlebia (Nyl.) Gyeln. (Gr. *leukos*, white + *phleb*, of or relating to veins) Our only record for this northern species is from Allegan County, where it grows on soil at Saugatuck and in a Tamarack swamp in Calhoun County. The primary photobiont is *Coccomyxa*, although the cephalodia bear the cyanobacterium *Nostoc*.

Allegan-ASU, Calhoun-MSC

Peltigera neckeri Müll. Arg. (In honor of Belgian botanist and mycologist, Noël Martin Joseph de Necker, 1730-1793) Yet unknown from the region, this species is recorded from as nearby as Carroll and Champaign counties in Illinois. It black, longitudinally rolled apothecia are characteristic.

Peltigera polydactylon (Neck.) Hoffm. (Gr. *poly*, many + *daktylos*, a finger, toe; from the numerous lobes) Calkins & Huett (1898) reported this species from La Salle County, and we have one modern collection from the bluff of the Fox River near Sheridan, where it grows under remnant *Pinus strobus*. An early McHenry County record is a mixed collection (Willey #58) from McHenry County, labeled *P. canina*, which is also in the packet. [tenuiorin, triterpenoids, ± gyrophoric acid]

McHenry-ILL

Peltigera ponojensis Gyeln. (after the Ponoy River on the Kola peninsula in Russia) Our only record for this northern and western species is from mossy sand at Old Baldy near Saugatuck.

Allegan-MSC

Peltigera praetextata (Sommerf.) Zopf (L. *prae-*, before, very + *textus*, weave + *-atus*, provided with; from the tight tomentum) = *P. canina.* var. *rufescens* (Weis.) Mudd f. *innovans* (Körb.) J. W. Thomson. This species, only weakly distinct from *P. rufescens* , and is found in habitats. The Berrien County record is from a sandy cemetery, with *Arenaria serpyllifolia, Cardamine hirsuta, Danthonia spicata, Antennaria plantaginifolia, Stellaria media,* and *Veronica arvensis.*

Berrien-MOR, Calhoun-MSC, Kosciusko-MOR, Van Buren-WIS, Walworth-WIS, Waukesha-WIS, Winnebago-

MOR

Peltigera rufescens (Weis) Humb. (L. *rufus*, reddish + *-escens*, beginning to; from the reddish brown thallus) = *P. canina* var. *rufescens* (Weis.) Mudd. This species is occasional on open, dry, often sandy substrates. Thomson (1950) reports it from Lake County, Indiana. A report of *Peltigera canina* from DuPage County, (Wilhelm & Lampa 1987) is referable here.

Allegan-MSC, Berrien-MOR, Boone-MOR, Cook-MOR,NY, DuPage-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Lake Il-MOR, LaGrange-MOR, LaSalle-MOR,NY, Lee-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Ogle-MOR, Porter-INDU,MIN,MOR, Racine-WIS, Will-MOR, Winnebago-MOR

PELTIGERACEAE

A. Apothecia infrequent, elongate, marginal or terminal; spores hyaline. . . . . **Peltigera**
A. Apothecia usually evident marginal or laminal, round or nearly so; spores becoming brownish. . . . **Solorina**

PERTUSARIA DC. PERTUSARIACEAE [Photobiont: Chlorococcoid. L. *pertusus*, perforated, punctured + *-arius*, belonging to; from the punctured appearance of the thallus caused by the ostiolate warts. ~ Thallus crustose, corticate, more or less continuous; apothecia, when present, a thalloid wart with a perithecium-like pore; spores large, thick-walled or double-walled, 1–8, hyaline, simple; secondary metabolites and species concepts those presented by Dibben 1980.]

1. Norstictic acid present; stictic acid absent; medulla K+ red.
   2. Thallus saxicolous. . . . . P. PLITTIANA
   2. Thallus corticolous.
      Spores 1 or 2. . . . . P. NEOSCOTICA
      Spores 4, 6, or 8.. . . . . P. PROPINQUA
1. Norstictic acid absent; stictic acid present; medulla K– or K+ yellow.
   3. Cortex C+ deep yellow, particularly around the ostioles.
      Spores 2; ostioles without yellow rims. . . . . P. PUSTULATA
      Spores 8; ostioles yellow rimmed or margined
         Medulla K+ yellow; spores mostly biseriate in the ascus. . . . . P. TEXANA
         Medulla K–; spores uniseriate in the ascus.. . . . . P. EPIXANTHA
   3. Cortex C– or weakly yellow
      4. Spores 2.
         Osteoles black. . . . . P. CONSOCIANS
         Osteoles not black, usually pale.. . . . . P. MACOUNII
      4. Spores prevailingly 3–6 per ascus.
         Spores with the outer surface of the inner wall smooth; thallus without tinctures of yellow; borders of ostioles concolorous with the verrucae... . . . . P. LEIOPLACA
         Spores with the outer surface of the inner wall roughened; thallus generally with tinctures of yellow-gray; borders of ostioles typically paler than the cortex of the verrucae. . . . . P. TETRATHALAMIA

Pertusaria consocians Dibben (L. *consocio*, to form a gathering, the allusion unclear) Yet unknown locally, this species has been recorded as nearby as Dane County, Wisconsin, where it was collected on *Acer*, but it is said mostly to grow on conifers in most of its range. ~ Thallus

C– throughout, UV– or UV+ orange-pink; spores usually 2, 95–210 μm × 35–55 μm, the wall 2-layered. [stictic acid, 4, 5-dichlorolichexanthone, constictic acid (minor).

Pertusaria epixantha R. C. Harris (Gr. *epi-*, above or upon + xanthos, various shades of yellow) Our only record for this southeastern species is from corporate landscape trees of *Ginkgo biloba* and *Tilia cordata*. ~ Thallus grayish with yellows tints, UV+ red-orange; the verrucae mostly separate but aggregated, well defined, C+ yellow; medulla K–, spores 8, uniseriate in the ascus, in our specimen 50–56 μm × 20–126 μm. [variolaric acid]

Berrien-MOR, Ottawa-MOR

Pertusaria leioplaca DC. (Gr. *leios*, smooth + *plax*, a flat round plate, dish; apparently from its smooth cortex) = *P. leucostoma* A. Massal. Our only record is the report by Calkins (1896), who reported this species from "oaks near Elgin and elsewhere." ~ Thallus pale gray green, UV+ pale pink; spores usually 4, 40–130 μm × 25–50 μm, the wall 2-layered. [± stictic acid, ± constictic acid, 4,5–dichlorolichexanthone]

Kane

Pertusaria macounii (I. M. Lamb) Dibben (after John Macoun, 1831–1920, Irish-born Canadian naturalist and botanist) = *P. pertusa* of some authors; *P. communis* of Calkins. There are two specimens of *Pertusaria* from Cook County in Calkins's *Lichenes Exsiccati* at ILL named *P. communis*. His #128 looks more like *Lepra trachythallina*, which see, while #285 resembles *Pertusaria. paratuberculifera* Dibben. He annotated two collections from Mahomet, Illinois, (ILL) as *P. communis*, but both are referable to *P. velata*. There is a specimen (Calkins #78, NY) that he called *P. communis*, and it is *P. macounii;* it was collected in Glencoe, on oak. The Rock and Waukesha county records were from the bark of *Carya ovata*; that from Lake County, Illinois is from *Carya cordiformis*. In Allegan County it grew on *Platanus occidentalis*. ~ Thallus grayish or bluish, UV+ orange, usually weekly C+ yellow around the ostioles; medulla K+ yellow; spores 2, 100–200 μm × 30–65 μm, the two walls mostly 5–8 μm , the inner wall notably with rounded radiating ridges, K+ dull purple. [stictic acid, constictic acid, 2,7–dichlorolichexanthone, un1, un2, un3]

Allegan-MOR, Cook-NY, Jefferson, Lake IL-MOR, Rock-WIS, Waukesha-WIS

Pertusaria neoscotica Lam. (after Nova Scotia) Our only record of this species is from the trunk of a Bur Oak along Carpenter Creek. [norstictic acid, connorstictic acid, ± planaic acid] ~ Thallus pale gray or with tinctures of brown, thinning into an indistinct margin; apothecial warts gregarious and often crowded, the ostioles obscure; spores 2, smooth, [norstictic acid]

Jasper-MOR

Pertusaria plittiana Erichs. (In honor of the American botanist and lichenologist, Charles Christian Plitt, 1869–1933) This southeastern species is known from as nearby as Warren County, Indiana, where it grew on a sandstone cliff face. Spores 80 μm –200 μm × 25 μm –70 μm, the inner walls rough. [norstictic acid, connorstictic acid, perlatolic acid, and stenosporic acid]

Pertusaria propinqua Müll. Arg. (L. *propinquus,* near; alluding to what I do not know) Our only record for this species is from a specimen collected on *Quercus velutina.* ~ Thallus gray or greenish, rugulose, the warts sometime crowded but distinct, UV+ orange-red; spores

usually 8, smooth, generally biseriate in the ascus. [norstictic acid, connorstictic acid]

LaGrange-MOR

Pertusaria pustulata (Ach.) Duby (L. *pustulatus*, blistered; from the corticate warts) This appears to be the most common *Pertusaria* in the region today, most eastern species evidently missing from the "prairie peninsula". Most of our specimens are from *Carya*, but the Walworth County record was on *Quercus rubra.* ~ Thallus pales to bluish-gray K+ yellow, UV–, the warts distinct or coalescing; spores 2, the inner walls without radiating ribs, K–. Depauperate specimens with weakly C+ yellow verrucae might be confused with *P. macounii*, which see. Spores 45 μm –160 μm × 25 μm –50 μm, the inner wall smooth. [stictic acid, constictic acid, ± un1, ± un2, ± un3, ± un5]

Allegan-MSC, Barry-WIS, Boone-MOR, Cook-NY, Jefferson-MOR, Kane-MOR, Kendall-MOR, Lake Il-MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Ogle-MOR, Racine-MOR, Rock-MOR, Walworth-MOR, Waukesha-MOR, Winnebago-MOR

Pertusaria tetrathalamia (Fée) Nyl. (Gr. *tetra-*, four of something + *thalamos*, the hidden chamber; an allusion to the often 4-ostiolate verrucae) Known from districts north and south of the Southern Lake Michigan Region, this species has been cited from as nearby as Montgomery County, Indiana (Dibben 1980). ~ Thallus UV+ pale pink-orange; spores 75 μm –150 μm × 30 μm –50 μm, the inner wall rough. [stictic acid, constictic acid, thiophaninic acid ± un1, ± un2, ± un3.

Pertusaria texana Müll. Arg. (of Texas) A prevailingly southern and eastern species, this lichen is known from as nearby as Warren County, Indiana. ~ Thallus UV+ orange. The 8-spored asci are characteristically biseriate proximally and uniseriate distally. Spores 35 μm –90 μm × 20 μm –45 μm, the inner wall smooth. [stictic acid, constictic acid, thiophaninic acid ± un1, ± un2, ± un3.]

PERTUSARIACEAE

A. Apothecia in poriform warts, perithecia-like, the pores sometimes closed. . . . . **Pertusaria**
A. Apothecia lecanorine, often obscured by pruina or soredia-like masses.
  B. Thallus C+ red (lecanoric acid). . . . . **Varicellaria**
  B. Thallus C-, without lecanoric acid.
    Warts KC+ violet, picrolichenic acid present. . . . . **Variolaria**
    Warts KC–, picrolichenic acid absent. . . . . **Lepra**

PHACOPSIS Tul. PARMELIACEAE [Parasitic on *Letharia*. Gr. *phaco*, lens-shaped + *opsis*, looks like. Parasitic on cortex; spores 8, simple, hyaline, elliptic.]

Phacopsis vulpina Tul. (L. *vulpinus*, like a fox, but no doubt named for one of its hosts, *Letharia vulpina*) Extirpated, if it was ever here; our only record based upon the improbable record for *Letharia columbiana*, which see. ~ Spores 13 μm –15 μm × 5 μm–7 μm.

Cook-F

PHAEOCALICIUM A. F. W. Schmidt MYCOCALICIACEAE [Photobiont absent. Gr. *phaios*, dusky, dark gray + *kalyx*, a cup; from the cup-shaped apothecia. ~

Thallus crustose, the apothecia long-stipitate; asci disintegrating in age, but not a mazaedium; spores, uniseriate in the ascus, simple to 1-septate, brown.]

Phaeocalicium polyporaeum (Nyl.) Tibell (*Polyporus,* a genus of fungus + L. *-eum,* denoting a place or source area; from it inhabitancy of polyporous fungi) Frequent in remnant wooded areas, where it grows on polyporous fungi, particularly *Trichaptum biforme* (Fr.) Ryvarden. The latter grows on a variety of dead trees, but the more frequent substrate with *Phaeocalicium polyporaeum* is *Prunus serotina.* ~ Spores narrowly to broadly ellipsoid, 11 μm –14 μm × 3 μm–4 μm.

Cook-F,MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Kane-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, McHenry-MOR, Racine, Rock-MOR, Walworth-MOR, Waukesha-ILLS, MOR, Will-F,MOR

PHAEOPHYSCIA Moberg PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *phaios*, dusky, dark gray + *Physcia*, which see; from the brownish gray thallus. ~ Thallus foliose, small to minutely lobed, adnate, brownish gray to nigrescent; lower cortex black or pale paraplectenchymatous; rhizines simple; apothecia, when present, lecanorine; spores 8, brown, 1-septate, ellipsoid.]

1. Thallus esorediate.
   Margins of apothecia and upper cortex smooth.. . . . . P. CILIATA
   Margins of apothecia and upper cortex with stiff spreading hairs.. . . . . P. HIRTELLA
1. Thallus sorediate.
   2. Thallus beset with colorless cortical hairs on the lobe tips or soredia.
      Cortical hair prevailingly on the lobe tips; soralia both laminal and marginal, pale to brow, few to none cortical hairs, the soredia fine to granular. . . . . P. HIRSUTA
      Cortical hairs prevailingly in the soralia; soralia marginal, soon nigrescent, abundantly beset with cortical hairs, the soredia granular to subisidiod or even lobular and corticate . . . . . P. KAIRAMOI
   2. Thallus without colorless cortical hairs, though white-tipped rhizines may project profusely along the lobe margins.
      3. Medulla red or deep orange nearly or quite throughout. . . . . P. RUBROPULCHRA
      3. Medulla white.
         4. Soredia granular, somewhat diffused in poorly delimited soralia.. . . . . P. ADIASTOLA
         4. Soredia fine, farinose, confined to rounded soralia.
            5. Soralia strongly capitate, almost stipitate, primarily terminal on main or secondary lobes. .. . . . . P. PUSILLOIDES
            5. Soralia orbicular, but not capitate.
               Lower cortex usually pale or tan; thallus lobes prevailingly less than 0.3 mm wide. . . . . P. INSIGNIS
               Lower cortex black; lobes prevailingly more than 0.3 mm wide.. . . . . P. ORBICULARIS

Phaeophyscia adiastola (Essl.) Essl. (Gr. *adiastolos*, mixed, joined, not separated; probably from the more or less coalesced soralia) This species is characteristic of shaded dolomitic erratics, cliff faces and ledges; the Rock County record is from exposed sandstone; it much less common on shaded lignin.

Boone-MOR, Cook-MOR, DuPage-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Lake

In-MOR, LaSalle-MOR, Lee-MOR, Racine-MOR, Rock-WIS, Waukesha-MOR, Will-MOR, Winnebago-MOR

Phaeophyscia ciliata (Hoffm.) Moberg (L. *ciliatus*, furnished with cilia; from the projecting marginal rhizines) = *Physcia obscura* of Calkins. Commoner southward, this is an occasional species locally on open-grown trees, often in disturbed areas. Nearly a third of our specimens are from *Populus deltoides*, and we have three from dolomitic boulders in open areas. It almost always grows with *Candelaria concolor, Phaeophyscia pusilloides*, *Physcia millegrana*, and *Physcia stellaris*. We have even seen it growing on *Ramalina americana*.

Allegan-MOR, Barry-MSC, Benton-MOR, Berrien-MOR, Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR, Kosciusko-MOR, Lake Il-MOR, Lake In-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Ogle-MOR, Porter-MIN, Pulaski-MOR, Rock-MOR,WIS, St. Joseph In-MOR, Van Buren-MOR, Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Phaeophyscia hirsuta (Mereschk.) Moberg (L. *hirsutus*, with bristly hairs; from the cortical hairs on the apothecial margins) Including *P. cernohorskyi* (Nádv.) Essl., which is described as having labriform or capitate soralia, while *P. hirsuta,* in the strict sense, is said to have linear, mostly marginal soralia. As understood here, this species, *sensu lato*, is occasional on open-grown trees, usually in disturbed or cultural areas. It is just as likely to grown on weathered concrete, wood, and infrequently on both carbonate and siliceous rock. None of our specimens are fertile. Occasional, small specimens may have to few soralia to make the distinction between it and *P. kairamoi*, but the latter has very few cortical hairs on the distal lobe surfaces, while that is where such hairs are concentrated in *P. hirsuta.* See also notes under *P. kairamoi*.

Benton-MOR, Cook-MOR, DuPage-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kankakee-MOR, Kenosha-MOR, LaGrange-MOR, Lake Il-MOR, LaSalle-MOR, Porter-MIN, Rock-WIS, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Phaeophyscia hirtella Essl. (L. *hirtus,* stiffly hairy + *-ellus,* diminutive; from the small hairs around the rim of the apothecium) This species, which is weedy southward in the Midwest and common in Missouri, remains unknown from the Southern Lake Michigan region.

Phaeophyscia insignis (Mereschk.) Moberg (L. *insignis*, unique, well marked; probably from the pale lower cortex that is rare in *Phaeophyscia*) This species is not infrequent to our west and south, but our only local records is from a shaded siliceous and carbonate rocks, as well as the upper branches of *Populus deltoides*, *Quercus alba* and *Q. rubra*, where a frequent associate is *P. pusilloides*, which has notable capitate soralia. The soralia are similar to those of *P. orbicularis*, but the latter has broader lobes and a black lower cortex. See also notes under *Physciella melanchra*.

Boone-MOR, DuPage-MOR, Lake-IN -MOR, McHenry-MOR, Milwaukee-MOR

Phaeophyscia kairamoi (Vainio) Moberg (in honor of the Finnish botanist and industrialist, Alfred Oswald Kairamo, 1858-1858, who of the Botanical Museum in Helsinki, was also a senator and diplomat) Our records for this infrequent but overlooked species are from *Fraxinus lanceolata, Juglans nigra, Populus deltoides, Quercus alba*, headstones, a decorticate log, and among mosses over shaded dolomite, and both dolomitic and igneous erratics. Although we have seen only one fertile specimen locally, it is not uncommon for *P. kaimaroi*

to be fertile, the apothecia often bearing fine cortical hairs as seen in *P. hirtella*.

Barry-MOR, Benton-MOR, Boone-MOR, Cass-MOR, DuPage-MOR, Fulton-MOR, Iroquois-MOR, Jefferson-MOR, Kendall-MOR, LaGrange-MOR, Lake-IN-MOR, Livingston-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Pulaski-MOR, Rock-MOR, Steuben-MOR, White-MOR

Phaeophyscia orbicularis (Neck.) Moberg (L. *orbiculus*, a small circle + *-aris*, pertaining to; from the discrete circular soralia) Our only records for this species are from a marble tombstone, a dolomitic cliff face, and the bark of *Carya ovata* and *Quercus alba*. See also comments under *P. rubropulchra.*

DuPage-MOR, Elkhart-MOR, Kent-MOR, LaGrange-MOR, Livingston-MOR, Ogle-MOR, Rock-MOR

Phaeophyscia pusilloides (Zahlbr.) Essl. (from its original name, *Physcia pusilla,* an illegitimate name to which Zahlbruckner added *-oides,* like or resembling, to create a replacement name) Locally this species is ubiquitous on open-grown, usually fast-growing trees . In open areas it is occasional on boulders and fallen logs.

Allegan-MOR, Barry-MOR, Berrien-MOR, Calhoun-MSC, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR,MSC, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Ogle-MOR, Ottawa-MOR, Porter-MOR, Pulaski-MOR, Racine-MOR, Rock-MOR, St. Joseph In-MOR, Starke-MOR, Van Buren-MOR, Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Phaeophyscia rubropulchra (Degel.) Essl. (L. *ruber*, red + *pulcher*, beautiful; from the attractive red medulla) = *Physcia orbicularis* of Armstrong (1977); all of her voucher material is referable to this species. This species is very common on the bases of trees in open or partly shaded areas, where it often grows with associates such as *Physcia millegrana*, and in shaded woods, where it often is the only lichen. Some specimens have weakly disposed portions of red medulla and may be mistaken for *P. orbicularis*. A few or our specimens with red medullae have soralia more like *P. pusilloides*. [rhodophyscin]

Allegan-MSC, Barry-MSC,WIS, Benton-MOR, Berrien-MOR, Boone-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR,MSC, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Porter-INDU-MOR, Pulaski-MOR, Racine-MOR, Rock-MOR, St. Joseph-MOR, Starke-MOR, Steuben-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

PHYSCIA (Schreb.) Michx. PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *physke*, a blister, wart, sausage; from the well developed thalline apothecia. ~ Thallus foliose, small to minutely lobed, gray, the upper cortex always with atranorin; lower cortex white, usually corticate, rhizines simple to forked; apothecia lecanorine, the disks nigrescent, the hypothecium pale; spores 8, brown, 1-septate, thick-walled; pycnidia immersed, the conidia bacilliform.]

1. Thallus without isidia or soredia; apothecia common.
   2. Medulla K–; zeorin absent. . . . . P. STELLARIS
   2. Medulla K+ yellow; zeorin present.
      3. Lobes up to 1 mm wide. . . . . P. PUMILIOR

3. Lobes prevailingly more than 1 mm wide.
   Thallus saxicolous. . . . . P. PHAEA
   Thallus corticolous. . . . . P. AIPOLIA

1. Thallus sorediate or isidiate.
   4. Soredia fine and powdery, in delimited soralia.
      5. Tips of lobes hooded, the soralia nearly or quite concealed; long white marginal cilia conspicuous. . . . . P. ADSCENDENS
      5. Tips of lobes not concealing the soralia; cilia absent
         6. Lower surface pale brown; soralia grayish; thallus saxicolous. . . . . P. CAESIA
         6 Lower surface white; soralia white; thallus saxicolous or corticolous
            Thallus usually corticolous; soralia laminal, circular. . . . . P. AMERICANA
            Thallus usually saxicolous, soralia mostly associated with the lobe tips, mostly crescent-shaped. . . . . P. DUBIA
   4. Soredia granular to subisidiate, not in delimited soralia.
      7. Thallus loosely appressed, the lobes about as broad as long; corticolous or saxicolous. . . . . P. MILLEGRANA
      7. Thallus tightly appressed to placoidioid, the lobes notably longer than broad; saxicolous.
         8. Thallus placoidioid, even the lobe tips appressed; lobes distinct but flowing close together. . . . . P. DAKOTENSIS
         8. Thallus not placoidioid, the lower cortex discernable in many areas, particular at the tips; lobes distinct, commonly with the substrate quite visible between them, at least distally.
            Thallus rather easily detached from the substrate, the principal lobes flabelliform branched distally into the ultimate lobules. . . . . P. THOMSONIANA
            Thallus closely fixed to the substrate, difficult to detached from the substrate, the principal lobes linear to the tip. . . . . P. SUBTILIS

Physcia adscendens (Fr.) H. Olivier (L. *adscendens*, ascending; from the elevated thallus lobes) This northern species is frequent on a wide variety of corticolous substrates, as well as weathered concrete and dolomitic boulders. Saxicolous thalli are usually discrete, but thall are often admixed on corticolous substrates with *Candelaria concolor, Hyperphyscia adglutinata, Physcia millegrana, Physcia stellaris, Physiella chloantha*, and other species such that often only the cucullate ciliate lobes emerge from the melange. [atranorin]

Allegan-MOR,MSC, Barry-MOR<MSC,WIS, Berrien-MIN, Boone-MOR, Cass-MOR, Cook-F,MOR, DeKalb-MOR, DuPage-MOR,WIS, Ford-MOR, Grundy-MOR, Iroquois-MOR, Kane-MIN,MOR, Kendall-MOR, Kenosha-MOR,WIS, Kent-MOR,MSC, Lake Il-MOR, Lake In-MOR, La Porte-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Noble-MOR, Porter-INDU,MOR, Racine-MOR, Rock-WIS, St. Joseph IN-MOR, Starke-MOR, Steuben-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Physcia aipolia (Humb.) Hampe (Gr. *aei*, ever, always + *polios*, hoary, gray; perhaps from the whitish gray maculae present throughout the upper cortex) = *P. stellaris* var. *aipolia* of Calkins; *Physcia granulifera* of Calkins. Widespread but rather infrequent, half of our specimens are from *Quercus alba*; the others are from *Acer platanoides, Ulmus americana, Populus deltoides, Juglans nigra,* and even *Rhamnus cathartica*. Curiously, Calkins listed the habitat as "boulders of the prairies and on stones at Lemont." [atranorin, zeorin ± other triterpenoides]

Allegan-MSC, Barry-MSC, Benton-MOR, Berrien-MIN, Boone-MOR, Cass-MOR, Cook-MIL, DeKalb-MOR, DuPage-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR,WIS, Kane-MICH,MOR, Kendall-MOR, Kenosha-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-MOR,NY, Lee-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Ogle-MOR, Porter-DUKE, Rock-MOR,WIS, Starke-MOR, Walworth-MOR,WIS,

Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Physcia americana G. Merr. (of America) Farther south, this is a common corticolous species; locally it is uncommon, known from *Fraxinus americana, Juglans nigra,* and *Quercus velutina;* two of our specimens are from shaded dolomitic cliff faces. [atranorin, unknown terpene]

Allegan-MSC, Cook-MOR, DuPage-MOR,WIS, Fulton-MOR, Kendall-MOR, Jefferson-WIS, Kane-MICH,MOR,US, Kendall-MOR, Newton-MOR, Ogle-MOR, Rock-WIS, Will-MOR, Winnebago-MOR

Physcia caesia (Hoffm.) Fürnr. (L. *caesia,* bluish gray; from the color of the soralia) Our only record for this species is from dolomitic boulders that line the entrance road to Magnolia Bluff County Park. This species occurs just to the north of our region on granitic boulders, particularly those that are commonly visited by perching birds. [atranorin, zeorin]

Rock-WIS,

Physcia dakotensis Essl. (of the Dakotas) Occasional of granitic or basaltic erratics in full sun. Many local reports of *Physcia subtilis* Degel. are referable either here or to *P. thomsoniana*, two species recently segregated by Esslinger (2004, 2017). [atranorin]

Cook-MOR, DuPage-MOR, Grundy-MOR, Kane-MOR, Kendall-MOR, McHenry-MOR, Ogle-MOR, Will-MOR, Winnebago-MOR

Physcia dubia (Hoffm.) Lett. (L. dubius, doubtful) Our only record for this mostly northern but widespread species is from a granitic erratic at a cemetery in Kendallville, Indiana, where it grows with *Acarospora veronensis*. ~ Medulla K–; soralia on the lobe tips, mostly on the lower surfaces.

Noble-MOR

Physcia millegrana Degel. (L. *mille*, a thousand + *granum*, a seed; from the numerous seed-like soredia) = *P. tribacia* of Calkins. This is the commonest lichen in the Southern Lake Michigan region. It grows on virtually all corticolous substrates, often without associates, but more often with *Candelaria concolor*. It also grows on weathered concrete, marble, and flagstone. [atranorin]

Allegan-MICH,MOR,MSC, Barry-MOR, Benton-MOR, Berrien-MOR, Boone-MOR, Branch-WTU, Calhoun-MSC,MOR, Cass-MOR, Cook-MIL,MOR,NY,WIS, DeKalb-MOR, DuPage-ILL,MOR,WIS, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR,WIS, Kalamazoo-MSC, Kane-MICH,MOR, Kankakee-F,MOR (see *Amandinea punctata*), Kendall-MOR, Kenosha-MOR,WIS, Kent-MOR,MSC, Kosciusko-MOR, LaGrange-MOR, Lake Il-ILL,MIN,MOR, Lake In-MOR,OSU, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR,NY, Milwaukee-MOR,WIS, Newton-MOR, Ogle-MOR, Ottawa-MOR, Porter-DUKE,INDU,MIN,MOR,OSU, Pulaski-MOR, Racine-MOR, Rock-MOR, St. Joseph-MOR, Starke-MOR,US, Steuben-MOR, Van Buren-ASU,MOR, Walworth-MIL,MOR,OSU,WIS, Waukesha-ILLS,MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Physcia phaea (Tuck.) J. W. Thomson (Gr. *phaios*, dark, dusky; a seemingly inappropriate epithet for the whitish gray lichen) Our only record for this species is from a collection made on a sandstone outcrop west of Covil Creek in La Salle County. [atranorin, zeorin]

LaSalle-MOR

Physcia pumilior R. C. Harris (L. *pumilus*, dwarfish + *-ior*, a comparative ending; from the tiny lobes, much narrower than those of its closest relative, *Physcia aipolia*) Rare, our only specimens are from *Populus deltoides* and *Fraxinus americana*. This is the *P. alba* of Midwestern

authors. [atranorin, zeorin]

DeKalb-MOR, DuPage-MOR, Walworth-MOR

Physcia stellaris (L.) Nyl. (L. *stellaris*, starry, speckled; perhaps from the often radiate silver thallus lobes) Including *P. stellaris* f. *tuberculata* (Kernst.) DT. & S. Thomson (1963) refers a Lake County, Illinois, specimen to *P. stellaris* f. *stellaris.* This species is ubiquitous on a wide variety of corticolous and lignicolous substrates, though nearly half of our specimens are from *Fraxinus lanceolata, Populus deltoides,* and *Quercus velutina*. Frequent associates include *Candelaria concolor, Chrysothrix caesia, Hyperphyscia adglutinata, Phaeophyscia pusilloides*, and *Physcia millegrana*. It is frequent on fallen branches, the source trees of which are sometimes difficult to determine. [atranorin]

Allegan-MOR,MSC, Barry-MSC, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MOR,MSC, Cass-MOR, Cook-F,MOR-NY, DeKalb-F,MOR, DuPage-ILL,MOR,WIS, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR,WIS, Kalamazoo-MSC, Kane-MOR, Kankakee-MOR, Kendall-F,MOR, Kenosha-MOR, Kent-MOR,MSC, Kosciusko-MOR, LaGrange-MOR, Lake Il-MIN,MOR, Lake In-MOR, La Porte-MOR, LaSalle-MOR,NY, Livingston-MOR, Marshall-MOR, McHenry-MOR,NY, Milwaukee-MOR,UWSP, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR,MSC, Porter-ILL,MIN,MOR, Pulaski-MOR, Racine-MOR, Rock-MOR,WIS, St. Joseph-MOR, Starke-MOR, Steuben-MOR, Van Buren-ASU,MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Physcia subtilis Degel. (L. *subtilis*, slender, minute, delicate; from the very narrow thallus lobes) Rare on partly shaded granitic erratics. See also the note under *P. dakotensis*. [atranorin]

Cook-MOR, DuPage-MOR, Kane-MOR, LaSalle-MOR, McHenry-MOR, Waukesha-MOR

Physcia thomsoniana Essl. (In honor of the Wisconsin lichenologist, John Walter Thomson, 1913-2009, founder of the Botanical Club of Wisconsin and mentor to many aspiring lichenologists) This species is rare on granitic erratics in pastures and old fields; there is also a specimen from nearby Lee County, Illinois, from the cortex of *Quercus velutina*. See also notes under *P. dakotensis*. [atranorin]

Barry-MOR, Fulton-MOR, Jefferson-MOR, LaSalle-MOR, Lee-MOR, Ogle-MOR, Walworth-MOR, Waukesha-MOR

PHYSCIACEAE

A. Thallus crustose, fully adherent to the substrate.
  Thallus lobed. . . . . **Hyperphyscia**
  Thallus not lobed. . . . . **Rinodina**
A. Thallus foliose.
  B. Thallus mineral or whitish gray, cortex K+ yellow
    Cells of upper cortex isodiametric; lower cortex corticate. . . . . **Physcia**
    Cells of upper cortex elongate and aligned with the lobes; lower cortex corticate or ecorticate. . . . . **Heterodermia**
  B. Thallus brown or brownish gray; cortex K–.
    C. Lobe surfaces abundantly pruinose; soralia linear and marginal. . . . . **Physconia**
    C. Lobe surfaces epruinose; soralia usually laminal.
      D. Thallus margins and rims of apothecia dissected into isidioid lobules.. . . . . **Anaptychia**
      D. Thallus and apothecia without isidioid lobules.
        Lower cortex paraplectenchymatous. . . . . **Phaeophyscia**
        Lower cortex prosoplectenchymatous. . . . . **Physciella**

PHYSCIELLA Essl. PHYSCIACEAE [Photobiont: *Trebouxia. Physcia*, which see + L. *-ellus*, diminutive; supposedly smaller than many *Physcia* species. ~ Thallus foliose, adnate, narrowly lobed, pale gray, the upper cortex and medulla K–; lower cortex white, prosoplectenchymatous; spores not seen, but presumably like those of *Phaeophyscia*.]

1. Many of the soredia in crescent-shaped soralia at the lobe tips.. . . . . P. CHLOANTHA
1. Soredia all, or nearly all in laminal soralia.. . . . . P. MELANCHRA

Physciella chloantha (Ach.) Essl. (Gr. *chloanthes*, budding; perhaps from the abundant sorediate lobe tips) = *Physcia chloantha* Ach.; *Phaeophyscia chloantha* (Ach.) Moberg. This is a ubiquitous corticolous species of disturbed and landscaped areas on fast-growing species such as *Acer saccharinum, Celtis occidentalis, Gleditsia triacanthos, Populus alba* and *Malus species*. In natural habitats it occurs on open-grown trees of *Quercus alba*. It also grows on tombstones with *Xanthomendoza* species and on concrete with *Endocarpon petrolepideum*, *Myriolecis dispersa,* and the like. It would not be difficult to confuse this species with *Phaeophyscia pusilloides,* particularly if admixed with other species, if care is not taken to determine the white color of the lower cortex and the crescent-shaped soredia.

Allegan-MOR, Barry-MOR, Benton-MOR, Berrien-MIN,MOR, Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kalamazoo-MSC, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kent-MOR, Kenosha-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MIN, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Porter-MOR, Rock-MOR,WIS, Steuben-MOR, St. Joseph IN-MOR, Starke-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Physciella melanchra (Hue) Essl. (Gr. *melaina*, black + *chroa*, color of the skin, superficial color; perhaps from the darkened color of the upper cortex) Infrequent, our only specimens are from weathered fence rails and *Acer rubrum*. This species might be confused with *Phaeophyscia insignis*, which is similar, with orbicular soralia, but much smaller lobed and with a paraplectenchymatous lower cortex; the lobes of the *Physciella* are commonly more than 0.3 mm wide and the lower cortex is prosoplectenchymatous. A report of *Phaeophyscia imbricata* from DuPage County (Wilhelm & Lampa 1987) is referred here.

DuPage-MOR, Fulton-MOR, Kosciusko-MOR, Lee-MOR, McHenry-MOR, Milwaukee-MOR, Ogle-MOR, Winnebago-MOR

PHYSCONIA Poelt PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *physcion*, paunch, belly; evidently derived from Physcia, which see. ~ Thallus foliose, adnate, narrowly lobed, brownish gray to brown, often pruinose at the lobe tips; lower cortex black but pale at the margins; medulla K–; spores not seen, but presumably like *Physcia*.]

1. Lobe margins and surfaces well beset with corticate-granular soredia or subisidioid granules; lower surface of the terminal lobes fibrous, with darkening lines extending proximally.. . . . . P. PERISIDIOSA

1. Lobe margins and surfaces well beset with powdery to finely granular, ecorticate soredia; lower surface of the terminal lobes corticate, dull white.
   Soralia strictly disposed along the margins, K– ; thallus lacking secondary metabolites. . . . P. DETERSA
   Soralia not strictly marginal, some discrete and crescent-shaped, usually K+ yellow; thallus C– or C+ red
   .. . . . . P. LEUCOLEIPTES

Physconia detersa (Nyl.) Poelt (L. *detersus*, cleansed, removed; the application here uncertain) Our only record for this species is from the bole of *Quercus rubra* in a mesophytic woods southwest of Waukesha.

Waukesha-MOR

Physconia leucoleiptes (Tuck.) Essl. (Etymology unknown to me; perhaps a Greek allusion to the white pruina. = *Physcia grisea* (Lam.) Zahlbr. f. *grisea* of Thomson (1963). Though not nearly so common, this species grows on substrates similar to those of *Candelaria concolor* and *Physcia millegrana*, which are its nearly constant associates. Our plants were long included with *Physconia detersa* (Nyl.) Poelt, which see. Those thalli with gyrophoric acid in the medulla have been segregated as *Physconia kurokawae* Kashiw. (after Syo Kurokawa, 1926– , director of the department of botany at the National Science Museum in Tokyo), but there are populations within which there are individuals with both chemotypes and most contemporary floristicians include with *P. leucoleiptes*. [secalonic acid A; ± gyrophoric acid]

Allegan-MOR,MSC, Barry-MOR,MSC, Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jefferson-FH,WIS, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Milwaukee-MOR,WIS, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Porter-MOR, Pulaski-MOR, Racine-MOR, Rock-MOR,WIS, St. Joseph IN-MOR, Starke-MOR, Steuben-MOR, Van Buren-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR

Physconia perisidiosa (Erichsen) Moberg (L. *per-*, thoroughly, utterly + *isidium*, corticate outgrowth + *-osa*, condition) Rare, our only records are from the boles of *Quercus alba* and *Salix nigra*, though in our western purlieus there is a specimen from a limestone boulder.

Jasper-MOR, Winnebago-MOR

PILOCARPACEAE

A. Apothecia without any evident proper margin; hypothecium hyaline. . . . . **Micarea**
A. Apothecia with a thin but evident proper or lecideine margin; hypothecium brown.
   Spores simple, less than 15 μm long.. . . . . **Leimonis**
   Spores 1-3 septate, more than 15 μm long. . . . . **Fellhanera**

PLACIDIOPSIS Beltr. VERRUCARIACEAE [Photobiont: *Trebouxia.* With the appearance of *Placidium*. ~ Thallus minutely squamulose, gray, saxicolous; perithecia black; spores 8, hyaline, 1-septate, ellipsoid.]

Placidiopsis minor R. C. Harris (L. *minor*, smaller, less) Yet unknown from the Southern Lake Michigan region, this minute, squamulose, areolate pyrenocarp grows on siliceous rocks, particularly pebbles in sandy areas, often with or over *Leimonis erratica* and *Trapelia glebulosa* (Harris 1979). ~ Thallus of dark grey-brown, flat to concave, adnate, dispersed to aggregate

areoles to 0.5 mm in diameter, the latter thinly greyish pruinose with a darker margin; spores 8.5 μm–10 μm × 4.5 μm–5 μm.

PLACIDIUM Flot. VERRUCARIACEAE [Photobiont: *Trebouxia* and *Myrmecia.* Gr. *plax*, a flat round plate, dish + *-idion*, diminutive; from the planar squamules. ~ Thallus squamulose, adnate, brown; perithecia immersed, the hamathecium evanescent; spores 8, hyaline, simple. Some authorities place those forms with rhizines in the genus *Clavascidium* Breuss.]

1. Thallus corticolous, squamulose and adnate to foliose with the lobes densely rhizinate below. P. ARBOREUM
1. Thallus terricolous, squamulose or crustose, tightly adnate; rhizines present or absent.
   2. Spores in 2 rows in the ascus; rhizines present, notably coarser than the fine, intermeshed rhizohyphae.. . . . . P. UMBRINUM
   2. Spores uniseriate in the ascus; rhizines absent, the lower surface bare or with an indument of fine rhizohyphae intermixed.
   3. Lower surface of squamules with broad bare black zones; rhizohyphae aggregated in restricted areas.. . . . . P. LACHNEUM
   3. Lower surface of squamules occupied nearly throughout with rhizohyphae alone or with rhizines intermixed.

      Rhizines absent. . . . . P. SQUAMULOSUM
      Rhizines present. . . . . P. LACINULATUM

Placidium arboreum (Mont.) J. W. Thomson (L. *arboreus*, of trees)) Our only record for this species is a Calkins specimen from La Salle County at the University of Illinois in the bound volumes of *Lichenes Exsiccati*. Calkins called it *Endocarpon arboreum*. Farther south, this species is occasional on old-growth, open-grown ashes and oaks of the white oak group. ~ Spores uniseriate in the ascus, 9 μm–12 μm × 4.5 μm–5.5 μm.

LaSalle-ILL

Placidium lachneum (Ach.) B. de Lesd. (Gr. *lachnos*, woolly hair, down; from the dense fibrous prothallus) Including, part, local reports of *Catapyrenium lachneum* (Ach.) R. Sant., *Dermatocarpon lachneum* (Ach.) A. L. Sm., *Endocarpon hepaticum* Ach.; probably also including *E. rufescens* Ach. Allo of our records are from dolomite prairies in Will and Boone counties and outwash prairies in McHenry and northwestern Cook counties. It often grows with *Heppia conchiloba* and *Psora decipiens* and prairie species such as *Andropogon gerardii, A. scoparius, Artemisia campestris caudata, Comandra richardsiana, Dalea purpurea, Euphorbia corollata, Liatris cylindracea, Schizachyrium scoparium, Silphium terebinthinaceum,* and *Solidago decemflora*. It occurs occasionally with *Placidium squamulosum*. ~ Spores uniseriate in the ascus, 14 μm–18 μm × 6 μm–8 μm.

Boone-MOR, Cook-MOR, McHenry-MOR, Walworth-MOR, Will-MOR

Placidium lacinulatum (Ach.) Breuss (L. *lacinulatus,* with small flaps or divisions) = *Clavascidium lacinulatum* (Ach.) M. Prieto. Our only record is from a morainic prairie ridge at LuLu Lake, near Troy Center, outwash gravel in Walworth County. ~ Spores uniseriate in the ascus, 12 μm–16 μm × 6 μm–7.5 μm.

Walworth-WIS

Placidium squamulosum (Ach.) Breuss (L. *squamulosus*, covered with small scales; from the aggregated scale-like thalli) Occasional in our western sector in areas of base-rich soil where the soil is shallow and or competition from vascular vegetation is scant. In Grows on thin soil over dolomite, gravelly hill prairies, and sand prairies near Lake Michigan. There are a few specimens from compacted clay and old gravel quarries, where it is obviously adventive. In sand prairie near the lake vascular vegetation associates include *Andropogon gerardii, Artemisia caudata campestris, Coreopsis lanceolata, Euphorbia corollata, Liatris aspera intermedia, Lithospermum croceum, Minuartia michauxii, Oligoneuron album, Schizachyrium scoparium, Smilacina stellata, Solidago decemflora, Solidago speciosa, Symphyotricum ericoides*, and *Symphyotrichum oolentangiense*. ~ Spores uniseriate in the ascus, 12 µm–16 µm × 5.5 µm–7.5 µm.

Cook-MOR, DuPage-MOR, Kane-MOR, Lake Il-MOR, Lake In-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Rock-MOR, Will-MOR, Winnebago-MOR

Placidium umbrinum (Breuss) M. Prieto & Breuss (L. *umbros*, full of shade + *-inus*, pertaining to; from the dark color of the apothecia) = *Clavascidium umbrinum* (Breuss) M. Prieto. Our only record for this species is the report from Jefferson County by Thomson (2003). ~ Spores biseriate in the ascus, 13 µm–17 µm × 6 µm–8 µm.

Waukesha-WIS

PLACYNTHIACEAE

One local genus. . . . . **Placynthium**

PLACYNTHIELLA Elenkin TRAPELIACEAE [Photobiont: *Chlorella?* The genus *Placynthium* + *-ellus*, diminutive; from the minute dark-colored, isidioid thallus. ~ Thallus crustose, brownish, of minute coralloid-isidiate granules; apothecia, lecideine, the ascus tip amyloid, I+; spores 8, hyaline, simple to 1-septate, ellipsoid.]

1. Thallus C+ pink; thallus corticolous or lignicolous. . . . . P. ICMALEA
1. Thallus C–; thallus arenicolous or lignicolous.
   Wet thallus granules dark brown to black, less than 0.1 mm across. . . . . P. ULIGINOSA
   Wet thallus granules distinctly greenish, mostly more than 0.1 mm across. . . . . P. OLIGOTROPHA

Placynthiella icmalea (Ach.) Coppins & P. James (Gr. *icmas*, moisture + *aleo*, warmed or exposed to the sun; perhaps from the dark color of the thallus on weathered wood that gives the appearance of a moist stain) = *Saccomorpha icmalea* (Ach.) Clauzade & Roux. Skorepa's report of *Lecidea uliginosa* from Will (his #5217, SIU) is referable here. It is occasional on dead limbs, decorticate logs, and old wood. Even though this species contains gyrophoric acid, which typically reacts C+ pink, it is a fast-fading pink, and sometimes difficult to discern from a simple C test. Negative results should be confirmed with TLC before concluding the specimen is not *P. icmalea.* Wetmore (1988) reports it from Porter County. Not too distant from our region, north and south, is *P. dasae* (Stirton) Tønsberg (etymology obscure), which also

produces gyrophoric acid, has extremely fine granules, scarcely 0.02 mm in diameter; those of *P. icmalea* usually run 0.025 mm or more in diameter. ~ Spores 8 μm–12 μm × 4 μm–5 μm. [gyrophoric acid, ± lecanoric acid]

Cook-MOR, DuPage-MOR, Jasper-MOR, Lake Il-MOR, Lake In-MIN,MOR, LaPorte-MOR, Ottawa-MSC, Porter-MIN, Walworth-MOR, Will-MOR

Placynthiella oligotropha (J. R. Laundon) Coppins & P. James (Gr. *oligos*, few, small + *trophis,* well nourished; from its tendency to grow in areas where nutrients are scarce, such as on sand) = *Saccomorpha oligotropha* (J. R. Laundon) Clauzade & Roux. The Porter County specimen was collected on sand north of Furnessville Road along the horse trail south of the visitor center at the Indiana Dunes National Lakeshore (Wetmore 1988). ~ Spores 9 μm–15 μm × 4.5 μm–7.5 μm. [no substances]

Porter-MIN

Placynthiella uliginosa (Schrad.) Coppins & P. James (L. *uliginosus,* full of moisture; perhaps the dark thallus appears soaked from a distance) Locally this species is a rather common sand binder, but apothecia are rarely noted. Our only local records for this species are in Black Oak savannas, but it is a frequent sand binder in sandy prairies farther south and will certainly be documented more regularly in our sand counties. ~ Spores 7 μm–15 μm × 5 μm–7 μm. [no substances]

Allegan-MOR, Berrien-MOR, Cook-MOR, Kankakee-MOR, LaSalle-F, Pulaski-MOR, Will-MOR

PLACYNTHIUM (Ach.) Gray PLACYNTHIACEAE [Photobiont: *Dichothrix* and *Scytonema.* Etymology evidently known only to Acharius. Thallus crustose to dwarf-foliose, black, gelatinous; apothecia lecideine; spores 8, hyaline, 1–3 septate.]

Placynthium nigrum (Huds.) Gray (L. *niger*, black; from the color of the thallus) = *Pannaria nigra* of Calkins. This species is rare on weathered dolomitic erratics and outcrops. ~ Spores 8 μm–20 μm × 3.5 μm–6.0 μm.

Boone-MOR, Cook-MOR, DuPage-MOR, Kane-MOR, Kankakee-MOR, Ogle-MOR, Will-MOR

PLEOSPORACEAE

One local genus. . . . . **Kirschsteiniothelia**

POLYSPORINA Vězda ACAROSPORACEAE [Photobiont: *Trebouxia* and *Myrmecia.* Gr. *poly*, many + *spora*, seed + L *-inus*, pertaining to; from the numerous spores in each ascus. ~ Thallus crustose, saxicolous, endolithic or obscure; apothecia lecideine, the disks commonly with carbonaceous inclusions; paraphyses much branched and anastomosed; asci I– but much thickened at the tips; spores numerous, minute, bacilliform, simple.]

Polysporina simplex (Taylor) Vězda (L. *simplex*, simple; perhaps from it simple form, having tiny apothecia and no thallus) Our only records of this species are from a granitic

boulders, often with *Lecanora polytropa*. *Polysporina urceolata* (Anzi) Brodo (L. *urseolus*, a little urn or pitcher) has been reported from "dolomitic gravel on a hill prairie near Elgin," but no specimen can be found. ~ Spores 3 μm–5 μm × 1.5 μm–1.9 μm.

Cook-MOR, DuPage-MOR, Grundy-MOR, Lake-Il -MOR, LaSalle-ILL,MOR, Ogle-MOR

PORINACEAE

One local genus. . . . . **Pseudosagedia**

PORPIDIA Körb. PORPIDIACEAE [Photobiont: *Trebouxia*-like. Gr. *porpe*, a buckle or pin, a brooch + *-idion*, diminutive; conceivably from the apothecia, evocative of little pins or brooches. ~ Thallus crustose, white to grayish, saxicolous; apothecia immersed or nearly so, lecideine; spores 8, hyaline, simple, ellipsoid, halonate; axis of ascus apex strongly amyloid, *Porpidia*-like.]

1. Apothecia densely gray pruinose. . . . . P. ALBOCAERULESCENS
1. Apothecia epruinose, black.
   Apothecial rim finely but distinctly radiately cracked or wrinkled. . . . . P. SUBSIMPLEX
   Apothecial rim smooth or essentially so. . . . . P. CRUSTULATA

Porpidia albocaerulescens (Wulfen) Hertel & Knoph (L. *albus*, white + *caeruleus*, dark blue + *-escens*, beginning, becoming, slightly; from the color of the apothecia) Our only record for this species is from a granitic boulder Serena, in La Salle County. ~ Thallus epilithic, grayish green to whitish; apothecia immersed, 0.5–1.5 mm across, heavily pruinose; spores 17 μm–25 μm × 6 μm–10 μm. [stictic acid, norstictic acid]

LaSalle-MOR

Porpidia crustulata (DC.) Hertel & A. J. Schwab (Gr. *crustulatus*, burnt or charred; from the black apothecia) Our only records for this species are from sandstone exposures. Armstrong (1977) reported this species (as *Lecidea crustulata*) from the Morton Arboretum in Du Page County, but her specimen was sterile and collected from oak. *Porpidia macrocarpa* (DC.) Hertel & Knoph (Gr. *macros*, large + *carpos*, fruit) is saxicolous, and is similar to *P. crustulata*, except that the apothecia are larger (mostly more than 1 mm across) is known from the Midwest, but all such identified specimens we have seen locally are referable here. Another lichen with black, lecideine apothecia 0.5 mm or more wide is *Carbonea latypizodes* (Nyl.) Knopf & Rambold, is reported from nearby Green County, Wisconsin, on sandstone. It differs in having atranorin in the thallus. Also compare with *Lecidella stigmatea*. ~ Thallus mostly endolithic; apothecia not pruinose, 0.3–1.2 mm across, the margin neither brittle nor radially cracked; spores 11 μm–20 μm × 5 μm–9 μm. [stictic acid, ± norstictic acid]

LaSalle-MOR, Ogle-MOR

Porpidia subsimplex (H. Magn.) Fryday (L. *sub*, a little like, nearly + *simplex*, simple; the allusion unclear, though possibly Magnusson was impressed by a superficial resemblance to *Polysporina simplex*) = *P. tahawasiana* Gowan. Our only record for this species is from Lee County, where is grows on an exposed sandstone ledge. It is very similar in appearance to

P. crustulata, and there are some specimens that are discouragingly ambiguous in their identity. In some cases, unlike with *P. crustulata,* the hymenium of *P. subsimplex* reddens a bit with moisture. ~ Thallus endolithic; apothecia, the margin notably brittle and radially cracked; spores 12 μm–18 μm × 6 μm–8 μm.

LaSalle-F, Lee-MOR

PORPIDIACEAE

One local genus. . . . . **Porpidia**

PROTOBLASTENIA (Zahlbr.) J. Steiner PSORACEAE [Photobiont: Chlorococcoid. Gr. *protos*, first, primary + *blastos*, a germ, bud, shoot + *-enos*, pertaining to; from the simple spores. Notwithstanding the K+ purple apothecium, which is evocative of *Caloplaca,* the anatomy of the ascoma and spores are more *Psora*-like. ~ Thallus crustose, endolithic to thinly epilithic, grayish; apothecia sessile, orange, K+ magenta without an evident margin; spores 8, hyaline, simple, ellipsoid; parietin.]

Protoblastenia rupestris (Scop.) J. Steiner (L. *rupestris*, growing on rocks; from its habitat) Our only records of this species are from exposed dolomitic bedrock. Calkins & Huett (1898) reported *Biatora calcivora* (= *Clauzadea immersa*) from nearby La Salle County, but Richard Harris (pers. comm.) believes this report is likely to be referable here. ~ Spores 10 μm–15 μm × 5.5 μm–8.5 μm.

Boone-MOR, Cook-MOR, DuPage-MOR, Will-MOR

PROTOPARMELIOPSIS M. Choisy LECANORACEAE [Photobiont: *Trebouxia.* Gr. *proto-*, first, original, chief + *parmelia* + Gr. *opsis*, aspect, view, appearance, evidently evocative of a nascent *Parmelia.* ~ Thallus crustose, yellow-green, the margins effigurate; apothecia common, lecanorine the rims paler than the disks; spores 8, hyaline, simple or rarely 1-septate, ellipsoid.]

Protoparmeliopsis muralis (Schreb.) M. Choisy (L. *muralis*, growing on walls; from its frequent occurrence on walls) = *Lecanora muralis* (Schreb.) Rabenh. This species is characteristic of dolomitic outcrops and erratics in pastures and prairies, but can in habit weathered concrete and even siliceous rocks, such as granite or basalt. Evidently a species native to the area, it is interesting that Calkins did not report it. Farther south and west, specifically on siliceous or sandstone substrates, one may encounter specimens with gyrophoric acid in the cortex, which specimens may be called *P. gyrophorica* Lendemer. Known from just outside the region is *Lecanora valesiaca* (Müll. Arg.) Stizenb., which would key here, but it has an abundantly pruinose thallus and lacks triterpenoids. [usnic acid, triterpenoides, ± fumarprotocetraric acid]

Boone-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Grundy-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake Il-MOR, LaSalle-MOR, Lee-MOR,

Livingston-MOR, McHenry-MOR, Ogle-MOR, Racine-MOR, Rock-WIS, Walworth-MOR,WIS, Will-MOR, Winnebago-MOR

PSEUDOSAGEDIA (Müll. Arg.) M. Choisy PORINACEAE [Photobiont: *Trentepohlia*. Gr. *pseudo-* false + *sagedia*, evocative of the genus *Sagedia*. ~ Thallus crustose, continuous to rimose; perithecia black, the ostiole pale; hamathecium not inspersed, the pseudoparaphyses nearly unbranched, not anastomosing; spores 8, hyaline, 4-several celled, fusiform.]

Pseudosagedia chlorotica (Ach.) Hafellner & Kalb (Gr. *khloros*, greenish-yellow, perhaps from the color of the hypothecium) = *Porina chlorotica* (Ach.) Müll.-Arg.; *Trichothelium chloroticum* (Ach.) R. C. Harris. Our only records are from granitic erratics. ~ Thallus rather well-defined, brownish or greenish; spores not ornamented, 16 μm–25 μm × 4 μm–6 μm.
DuPage-MOR, LaSalle-F, Will-MOR

PSILOLECHIA Massal. PSILOLECHIACEAE [Photobiont: *Trebouxia.* Gr. *psilos*, tall, high + *lechos*, couch, bed, nest; the allusion unclear. ~ Thallus crustose, vivid yellow-green, leprose, without a prothallus; apothecia yellow, without a thalline margin; spores 8, hyaline, simple.]

Psilolechia lucida (Ach.) M. Choisy (L. *lucida*, bright, shining) Our only record for this species is from a shaded sandstone cliff with a northeast exposure. ~ Compare with *Chaenotheca furfuracea*, which is similar vegetatively but produces pulvinic acid instead of rhizocarpic acid; its apothecia are stalked with a mazaedium, while those of *Psilolechia* are sessile and with 8-spored asci. ~ Spores, 4 μm–5 μm × 1 μm–1.5 μm. [rhizocarpic acid]
LaSalle-MOR

PSILOLECHIACEAE

One local genus. . . . . **Psilolechia**

PSORA Hoffm. PSORACEAE [Photobiont: *Trebouxia* and *Myrmecia.* Gr. *psora*, the itch, scurvy; from the scurfy or scab-like thalli. ~ Thallus squamulose, adnate, saxicolous or terricolous, brownish or pinkish; apothecia convex, without a discernable margin, the epithecium colored, K+ magenta, the hypothecium pale; spores 8, hyaline, simple, ellipsoid.]

1. Thallus saxicolous; squamules brown; apothecia, rusty red, centrally disposed. . . . . P. PSEUDORUSSELLII
1. Thallus terricolous; squamules pink; apothecia nigrescent, marginally disposed. . . . . P. DECIPIENS

Psora decipiens (Hedwig) Hoffm. (L. *decipiens*, deceiving; perhaps from its superficial resemblance to another species) = *Biatora decipiens* of Fink (1906). Our specimens are without substances, which circumstance refers them to "strain I" of Timdal (1986). He places those

specimens with norstictic acid into "strain II" and those with hyposalazinic acid into "strain III". Most of our specimens are from open kames and other prairies where dolomite is exposed and shallow pockets of calcareous soils have developed in cracks or among the pebbles. We have one specimen from the calcareous stable sands of the lake plain prairies of Illinois Beach State Park. The pinkish, white-farinose margins are in strong contrast to the chestnut-brown thalli of *Placidium lachneum* or *P. squamulosum*, usually one of which is an associate.

Boone-MOR, Cook-MOR, Kane-MOR, Lake Il-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Walworth-MOR,WIS, Will-MOR, Winnebago-MOR

Psora pseudorussellii Timdal (Gr. *pseudes*-, false, deceptive + *russellii*; resembling *Psora russellii*, named after John Lewis Russell, 1808–1873, American cryptogamist and naturalist) Our only records of this species are from exposed dolomitic bedrock in our western sector.

Boone-MOR, Winnebago-MOR

PSORACEAE

A. Thallus crustose, not of adnate squamules; apothecium K+ purple. . . . . **Protoblastenia**
A. Thallus of adnate squamules; apothecia K-.
Squamules gray to nigrescent. . . . . **Psorula**
Squamules not gray or nigrescent. . . . . **Psora**

PSOROGLAENA Müll. Arg. VERRUCARIACEAE [Photobiont: *Chlorococcoid.* Gr. *psora*, the itch, scurvy + *glenos,* the eyeball. ~ Thallus crustose-filamentous, the cortical cells papillate; perithecia, pale, partly immersed, without pseudoparaphyses, the hymenial gel I+ blue or orange; spores 8, hyaline, 1-several septate to muriform.]

Psoroglaena dictyospora (Orange) H. Harada (Gr. *diktuon*, net + *spora*, seed; the allusion unclear to me) This species is known from as nearby as Vermilion County, Illinois, where it was collected at the base of a Catalpa at the headquarters area of Kickapoo State Park.

PSOROTICHIA A. Massal. LICHINACEAE [Photobiont: *Chroococcidiopsis.* Gr. *psora*, the itch, scurvy + *teichos*, wall around a city; probably from its frequency on concrete walls and rails. ~ Thallus crustose to subsquamulose, black, saxicolous, gelatinous; apothecia lecanorine, the proper exciple usually evident at the edge of the disk, with a granular margin and brown disk; asci I–, without apical structures; spores 8, hyaline, simple, ellipsoid.]

Psorotichia schaereri (A. Massal.) Arnold (after Ludwig Emanuel Schaerer, 1785–1853, Swiss clergyman and lichenologist) Our only record of this species is from an HCL– sandstone boulder along the old E. J. & E. Railroad right-of-way in a strip mine area south of Dell Abbey and from limestone, “shale and rocks” in LaSalle County. See also *Pyrenocarpon thelestomum*. ~ Thallus granular-verruculose to areolate, granular-isidiate; apothecia more or

less immersed, usually 1 per areole, to 0.5 mm across, poriform to plane with a reddish disk when moist; spores 11 μm–19 μm × 5 μm–9 μm.

Grundy-MOR, LaSalle-MOR, PH, WIS

PSORULA Gotth. Schneid. PSORACEAE [Photobiont: *Chlorococcoid.* Gr. *psora*, the itch, scurvy + *-ula*, diminutive; probably from its resemblance to *Psora*. Lichenicolous on *Spilonema*. ~ Thallus squamulose, greenish, gregarious; apothecia marginal, black, flat to convex, the margin scarcely discernable; spores 8, hyaline, simple, ellipsoid.]

Psorula rufonigra (Tuck.) Gotth. Schneid. (L. *rufo-* reddish + *nigra*, a black object) Our only record for this species is siliceous rocks at Magnolia Bluff, associated with *Spilonema revertens*, which see. ~ Spores 10 μm–14 μm × 5 μm–7 μm.

Rock-WIS

PUNCTELIA Krog PARMELIACEAE [Photobiont: *Trebouxia.* L. *punctum*, a prick, puncture, or dot + *-elia*, a generic ending, probably from Gr. *eilo*, to roll up or collect, as in a collection or group; from the numerous pseudocyphellae. ~ Thallus foliose, rather large, gray, the upper cortex usually pseudocyphellate, always with atranorin, the lower cortex brown to white, with simple rhizines; apothecia, when present, sessile, lecanorine, with a brown disk; spores 8, hyaline, simple, ellipsoid; conidia narrowly bacilliform to uncinate.]

1. Thallus lacking isidia and soredia; medulla C– or C+ red
   - Medulla C-. . . . . P. BOLLIANA
   - Medulla C+ red. . . . . P. GRAMINICOLA

1. Thallus with either isidia or soredia; medulla C+ red.
   2. Thallus isidiate. . . . . P. RUDECTA
   2. Thallus sorediate.
      - Soredia coarse and pustular, often coalescing into large areas and becoming lobulate. . . . . P. MISSOURIENSIS
      - Soredia farinose, in round delimited soralia.. . . . . P. CASEANA

Punctelia bolliana (Müll. Arg.) Krog (after Ernst Friedrich August Boll, 1817–1868, German botanist who collected the type in Texas) = *Parmelia bolliana* Müll. Arg., *P. frondifera* G. Merr. Culberson & Culberson (1956) map several dots from the Chicago area. *Parmelia borreri*, from Cook County (*Calkins LE #323*, ILL) is referable here, as well as Lake County, Illinois, and McHenry County specimens by the same name. In our Indiana counties, *Quercus velutina* is the substrate of choice elsewhere *Q. alba, Q. macrocarpa,* and *Q. rubra* are the preferred substrates. Other frequent substrates include *Carya ovata* and *Juglans nigra*. In most cases the trees are open-grown and relatively large. [atranorin, protolichesterinic acid]

Allegan-MSC, Barry-MSC, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MOR, Cass-MOR, Cook-ILL,MOR, DeKalb-MOR DuPage-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR,

Jefferson-MOR,WIS, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In -MOR, LaPorte-MIN, LaSalle-ILL,MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR,NY, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Porter-MOR, Pulaski-MOR, Racine-MOR, Rock-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

Punctelia caseana Lendemer & Hodkinson (in honor the professor of botany at the College of William , Mary, Martha A. Case, 1959-) = *Parmelia subrudecta* and *Punctelia subrudecta* of local authors, not Nylander; *Parmelia borreri* of most local authors, not Turner. Most of our specimens are from *Quercus alba,* though there is one from an open-grown tree of *Prunus serotina*. Calkins (1896) regarded this species as common in the region at the turn of the century, but more than likely he was referring to *Punctelia bolliana.* [lecanoric acid, atranorin]

Benton-MOR, DeKalb-MOR, DuPage-MOR, Iroquois-MOR, Jefferson-MOR, Kane-MOR, Marshall-MOR, Newton-MOR, Steuben-MOR

Punctelia graminicola (B. de Lesd.) Egan (L. *gramen*, grass + *cola*, dwell; the allusion lost on me) = *Punctelia semansiana* (Culb. & C. Culb.) Krog Much more frequent farther south, our only records for this species is from *Acer saccharum* and *Tilia americana*. [lecanoric acid, atranorin]

Allegan-MSC, DeKalb-MOR, Steuben-MOR

Punctelia missouriensis G. Wilh. & Ladd (after the state of Missouri) The only substrate from which we have this species locally is *Quercus,* but farther downstate and across southern Illinois into Missouri it grows on a wide variety of trees, often in highly disturbed areas. [atranorin, lecanoric acid]

Barry-MOR, Benton-MOR, Berrien-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Jasper-MOR, LaGrange-MOR, Lake Il-MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Newton-MOR, Pulaski-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR

Punctelia rudecta (Ach.) Krog (L. *rudis*, rough, raw, wild + *ecto-*, out of, from; probably from the rough appearance of the upper cortex caused by the pseudocyphellae) = *Parmelia rudecta* and *P. borreri* var. *rudecta* of Calkins. Three-fourths of our specimens are from open-grown oaks, but we have specimens from *Juglans nigra, Larix laricina, Maclura pomifera,* and *Ostrya virginiana*; there is also a specimen from a basaltic boulder in an open pasture. The isidia are quite variable, ranging from fine, uniform, and simple to coralloid-branched and even sub-lobulate, with or without nigrescent apices. [lecanoric acid, atranorin]

Allegan-MICH,MOR,MSC, Barry-MSC, Benton-MOR, Berrien-MIN, Boone-MOR, Branch-MOR, Calhoun-MSC, Calhoun-MOR, Cass-MOR,MSC, Cook-ILL,MOR,NY, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Kent-MSC, Kosciusko-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR,WIS, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MICH,MOR,MSC, Porter-INDU,MOR, Pulaski-MOR, Racine-MOR, Rock-MOR,WIS, Starke-US, Steuben-MOR, Walworth-MOR, Waukesha-MOR,WIS, White-MOR, Will-MOR, Winnebago-MOR

PYCNOTHELIA Dufour CLADONIACEAE [Photobiont: Chlorococcoid. Gr. *pyknos*, dense, thick + *thele*, nipple; from the tiny, clustered apothecia atop the podetia. ~ Thallus fruticose, the papillae (pseudopodetia) arising from a

persistent granular primary thallus, corticate, simple to branched, with a brown or nigrescent tip; apothecia rare, but with 8, hyaline, simple to 1-septate spores.]

Pycnothelia papillaria Dufour (L. *papilla*, nipple, teat + *-arius*, belonging to; probably from the swollen, apothecia-tipped podetia) Our only record for this species is from sandy soil on a sandstone cliff at the Nachusa Grassland. [usually atranorin, ± fatty acids, such as protolichesterinic acid]

Ogle-MOR

PYRENOCARPON Trevisan LICHINACEAE [Photobiont: *Chroococcidiopsis*. Gr. *pyren*, kernel + *karpos*, fruit. ~ Thallus crustose to subsquamulose, black, saxicolous, gelatinous; apothecia at first punctiform, becoming exposed, the reddish brown disk surrounded by a whitish proper exciple as well as a thalline exciple; epithecium brownish, the hyaline hymenium of branched, anastomosing paraphyses; asci I–, without apical structures; spores 8, hyaline, simple, ellipsoid.]

Pyrenocarpon thelostomum (J. Harriman) Coppins a & Aptroot (Gr. *thele*, nipple + L. stoma, mouth) Our only records are from weathered concrete, limestone, and pebbles in the splash zone of Lake Michigan. Dillman *et al.* (2012) report the Lake County record (Hyerczyk #2545 F,MOR) as the first record for North America, which he had collected in 2008, but they erroneous list the location as Michigan. The Cook County record was collected in 2003 (Hyerczyk #1854 MOR), but filed under the name "*Psorotichia frustulata*."

Cook-MOR, Lake Il-MOR

PYRENOCOLLEMA Reinke XANTHOPYRENACEAE [Photobiont: *Gloeocapsa.* Gr. *pyren*, kernel + *Collema*, which see; because of the perithecia on an otherwise collemataceous thallus. ~ Thallus crustose, obscure, saxicolous; perithecia nigrescent, paraphyses evident, the Spores 8, hyaline, asymmetrically 1–2 septate; conidia bacilliform to ellipsoid.]

Pyrenocollema prospersellum (Nyl.) R. C. Harris (L. *prospergo,* to sprinkle + *-ellus,* diminutive; probably in reference to the well scattered, non-aggregated perithecia) = *Verrucaria prospersella* Nyl.; *Arthopyrenia prospersella* (Nyl.) Zahlbr. Fink (1935) lists this species as a northern Illinois endemic. Harris (1975) described this species as: "*Thallus gray, continuous to rimose, epilithic. Photobiont with cells blue green in color, in small groups but without an obvious sheath. Ascocarps globose, 0.2–0.25 mm in diameter. Asci slightly ovate to elliptical. Spores 17–23 × 8–11 μm. Habitat on calcareous rocks, possibly more or less aquatic. It is known from a Belgian collection in addition to the type locality.*" Tucker & Harris (1980) cite the type 16 km from Chicago (H-NYL 991) and list the substrate in Louisiana as "sandstone outcrops." ~ Spores 17

μm–23 μm × 8 μm–11 μm.
Cook-F,MOR,NY

PYRENODESMIA A. Massal. TELOSCHISTACEAE [Photobiont: mostly *"Pseudotrebouxia."* Gr. *pyren*, kernel + *desmos*, a bond or fastening. ~ Thallus white or gray, with a black prothallus; apothecia lecanorine, the disks flat, black, the margin concolorous with the thallus, the epithecium K+ violet; hymenium pale; spores 8, hyaline, polaribilocular.]

Pyrenodesmia variabilis (Pers.) A. Massal. (L. *variabilis*, variable; perhaps from the variable size and appearance of the apothecia) = *Caloplaca variabilis* (Pers.) Müll. Arg. Rudolph (30) listed this species from LaSalle County. Interestingly, there is a Calkins specimen (F1177718) at the Field Museum referable to *Caloplaca atroalba,* which see. Our only record for this species is from a dolomitic boulder in a pasture at the Des Plaines Fish & Wildlife Area, near Wilmington. ~ Thallus grayish to pallescent, smooth, K+ violet; apothecia lecanorine, dark brown to black, the margin concolorous with the thallus; spores 12 μm–16 μm × 7 μm–9 μm. [thalloidima green]
LaSalle, Will-MOR

PYRENOPSIS Nyl. LICHINACEAE [Photobiont: Cyanobacterial the cells with a reddish sheath. Literally Gr. *pyren*, kernel + *-opsis*, resembling; more than likely from the ascocarps that initially appear pyronocarpous. ~ Thallus crustose, granulose to minutely verrucose or coralloid, without differentiated layers, usually saxicolous; apothecia minute, the disk closed at least initially, the exciple thalloid; paraphyses unbranched or indistinct;; spores 8, hyaline, simple.]

Pyrenopsis fuscoatra Fink. (*fuscus*, brown + *atra*, dark, black; dark brown) The type specimen for this evidently rare species was collected in nearby Montgomery County, Indiana, on limestone (Fuson #111, FH, MICH, US, WIS). ~ Thallus of brownish-black granules, forming a scattered or irregularly broken crust; apothecia to 0.3 mm across, closely adnate, becoming open with a black disk, the exciple becoming scant, entire; spores 13 μm–20 μm × 7 μm–10 μm. *Cryptothele permiscens* is similar by has a well developed, disk-obscuring exciple.

PYRENULA Ach. PYRENULACEAE [Photobiont: *Trentepohlia.* Gr. *pyren*, kernel + *-ulus*, diminutive; from the perithecia that are thought to resemble small kernels or grains. ~ Thallus crustose, corticolous, mostly endophloedeal; perithecia immersed; spores 8, brown, mostly 3-septate to submuriform; conidia filiform.]

1. Thallus UV+ yellow-orange ; spores pale yellowish brown; hymenium I+ greenish blue.. . P. PSEUDOBUFONIA
1. Thallus UV–; spores lavender brown; hymenium I+ or pinkish. . . . . P. SUBELLIPTICA

Pyrenula pseudobufonia (Rehm) R. C. Harris (Gr. *pseudes*, false, deceptive + ?) = *P. neglecta* R. C. Harris; *P. nitida* of North American authors, not (Weigel) Ach. Harris (1973) lists trees of mesophytic forests as the substrate for this species; it is common south and east of the Chicago region. It is probable that the reports of *P. glabrata* (= *P. laevigata* of Calkins) are referable here, even though Calkins described the thallus as whitish and thin, features that do not suggest *P. pseudobufonia.* Harris (1973) asserted that *P. laevigata* is rare in the Great Lakes region, and that it occurs mostly on *Betula* and occasionally on *Fraxinus,* and cited a specimen of *P. pseudobufonia* from Cook County. See also comments under *Arthopyrenia cinchonae.* ~ Spores 3-septate with lenticular cells, 13 μm–23 μm × 8 μm–11 μm. [lichexanthone]

Cook-MSU,NY

Pyrenula subelliptica (Tuck. *in* Lea) R. C. Harris (L. *sub,* below, almost, near + *ellipsis,* lack, imperfection + *-icus,* belonging to or emphasizing a character; from the elongate or imperfectly-formed median lumina of the spores) = *P. imperfecta* (Ell. & Ev.) R. C. Harris. Harris (1973) mapped this species from just south of the Southern Lake Michigan region; he listed its substrates as *Carpinus, Fagus, Fraxinus,* and *Quercus.* Most of the specimens we have seen too often have spore lumina evocative of *P. macounii* R. C. Harris, but the hymenium is usually notably, if not abundantly, inspersed with oil droplets and granules, and the white spots characteristic of *P. subelliptica* are occasionally evident. The only local specimen we have seen is an old one from Cook County (Calkins *s.n., n.d.* MOR). ~ Spores 24 μm–35 μm × 10 μm–15 μm.

Cook-MOR

PYRENULACEAE

A. Spores brown, 3-septate or occasionally 4–7 septate or even imperfectly muriform. . . . . **Pyrenula**
A. Spores 7–9 septate, or colorless and 3-septate. . . . . **Lithothelium**

PYRRHOSPORA Körb. LECANORACEAE [Photobiont: *Trebouxia.* Gr. *pyrrhos*, flame-colored; from the reddish apothecia of the type species. ~ Thallus crustose, corticolous, grayish, granular; apothecia brown or with orange or reddish tinctures, the margin scarcely evident or obsolete; spores 8, hyaline, simple, ellipsoid; xanthone in the apothecia.]

Pyrrhospora varians (Ach.) R. C. Harris (L. *varians*, changing; perhaps from the various shapes and degrees on confluence of the apothecia) = *Biatora varians* of Calkins (1896), who reported it from oaks and hickories. Locally frequent, on a variety of twigs and branches, our specimens are from *Gleditsia triacanthos, Juglans nigra, Populus grandidentata, Prunus serotina, Ptelea trifoliata, Rhus typhina* and weathered lignin. This species is weedy in and around St. Louis, Missouri. Some authorities consider this species a true *Lecidea*, to wit, *L. varians* Ach. ~ Thallus granular to continuous, usually KC+ orangish, often with a black prothallus; apothecia scattered or more typically aggregated in small cluster, 0.2–0.4 mm across; spores 9 μm–13 μm × 5.5 μm–7 μm. [xanthones]

Cook, DeKalb-MOR, DuPage-MOR, Lake-Il, MOR

PYXINE Fr. CALICIACEAE [Photobiont: *Trebouxia.* L. *pyxis*, a box + *-inus*, pertaining to; probably the apothecia reminded Fries of coin boxes. ~ Thallus foliose, rather small, gray to bluish-gray, sorediate , the small rounded lobes pruinose and with narrow, white, pseudocyphellae; lower cortex black, the rhizines simple to forked; medulla white but usually with tinctures of yellow to orange; apothecia not seen locally; spores 8, brown, 1–3 septate, ellipsoid; conidia narrowly bacilliform.]

1. Medulla yellow; cortex K– and UV+ bright yellow; lobes typically with a more or less continuous or plaque-like patch of pruina just back from of the tip. . . . . P. SUBCINEREA
1. Medulla salmon orange; cortex K+ yellow and UV–; lobes usually pruinose, the pruina granular-appearing and diffusely disposed near the tips. . . . . P. SOREDIATA

Pyxine sorediata (Ach.) Mont. (Gr. *soredion*, a little heap + *-atus,* an adjective ending; from the numerous soredia) In Newton County, we have two specimens from *Quercus velutina*. At Warren Woods in Berrien County it grew on a fallen ash, and at the Morton Arboretum it grew on the surface of a limb of an open-grown *Crataegus;* the Will County record is from *Populus deltoides*. [atranorin]

Berrien-MOR, DuPage-MOR, LaSalle-F, Newton-MOR, Waukesha-WIS, Will-MOR

Pyxine subcinerea Stirton (L. *sub*, below, almost, near + *cinereus*, ash-colored; from the grayish thallus) = *P. caesiopruinosa* of previous North American authors, not Nylander. Commoner farther south, our only records are from a cultivated elm at the Morton Arboretum, where it is presumed to be adventive, two from *Crataegus*, one from a dead oak, and one from a planted trees of *Gleditsia triacanthos* and *Tilia cordata*. According to Harris, *P. caesiopruinosa* (Nyl.) Imsh. is confined to the southeastern coastal plain, from where we have numerous specimens. It differs in that the medulla is K+ purple. [atranorin, lichexanthone]

Benton-MOR, Boone-MOR, Cook-MOR, DuPage-MOR, Kent-MOR, Marshall-MOR, Pulaski-MOR, White-MOR

RACODIACEAE

One local genus. . . . . **Racodium**

RACODIUM Pers. RACODIACEAE [Photobiont: *Trentepohlia.* Gr. *rachion*, a worn-out or torn garment, perhaps from its unwoven or threadbare. ~ Thallus minutely thread-like fruticose, black or blue-black, the hyphae lying parallel longitudinally over the surface of the photobiont; apothecia unknown.]

Racodium rupestre Pers. (L. *rupestre*, of rocks) This rather rare species is known from Rock Branch Nature Preserve in nearby Fountain County, Indiana, where it presumably grew on shaded siliceous rock. ~ Hyphae elongate, unbranched, 4-6 in parallel rows.

RAMALINA Ach. RAMALINACEAE [Photobiont: *Trebouxia.* L. *ramus*, a branch + *linum*, thread, rope; perhaps from the cord-like or lined appearance of the surface of the thallus branches. A genus in great need of revision, our position on the species delineated below is wholly provisional. ~ Thallus fruticose, bushy or pendant, the branches flattened; apothecia lecanorine, sessile to substipitate, the disks tan, the spores 8, hyaline, 1-septate, ellipsoid; conidia bacilliform.]

1. Thallus sorediate.
   - Thallus saxicolous, the soredia granular. . . . . R. INTERMEDIA
   - Thallus corticolous, the soredia very fine. . . . . R. FARINACEA

1. Thallus esorediate.
   - Principal thallus lobes not or scarcely expanded distally, less than 4 mm broad, smooth to often somewhat warty with pseudocyphellae. . . . . R. AMERICANA
   - Principal thallus lobes usually more or less expanded distally, more than 4 mm broad, smooth, pseudocyphellae rare or flush with the cortex. . . . . R. SINENSIS

Ramalina americana Hale (of America) Including *R. calicaris* and *R. calicaris* var. *fastigiata* of Calkins. Uncommon locally, our records are from *Acer negundo*, *Juglans nigra*, and *Populus deltoides*. Similar is *R. culbersoniorum* LaGreca, which is known from districts all around our region; it differs in having divaricatic acid as well as usnic acid. [usnic acid]

Allegan-MOR, Calhoun-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Kendall-MOR, Lake Il-MOR, Marshall-MOR,WIS, Milwaukee-FH,MIL,MOR, Racine-MOR, Waukesha-MOR

Ramalina farinacea (L.) Ach. (L. *farina*, mealy + *-aceu*s, resembling) The only specimen we have seen is from an open-grown dead ash. [usnic acid ±protocetraric acid, ±norstictic acid]

DuPage-MOR

Ramalina intermedia (Nyl.) Nyl. (L. *inter*, between, among + *medius*, middle; from its resemblance to two similar species) Not known from the 53-county Southern Lake Michigan region, there is a population of this rare lichen in Apple River Canyon State Park, in Jo Daviess County, where it grows on a limestone cliff near the center of the park. [usnic acid]

Ramalina sinensis Jatta (of China) = *R. calicaris* var. *fraxinea* of Calkins; *R. fastigiata* var. *subampliata* Nyl. Calkins reported it from oaks and old fences near Lemont. A Calkins Cook County specimen (*Lichenes Exsiccati* I-2), called *R. calicaris* var. *fastigiata* is referable here. Hale (1979), pointed out that *R. sinensis* is prevailingly southwestern and has decorticate areas on older portions of the thallus, a feature that does not describe our material, which is corticate throughout. (Thomson 1990) described as a "prairie-forest" border species with the branches much dilated distally: *R. unifolia* J. W. Thomson, which appears fairly distinctive in that it has strong longitudinal ridges intercalated with decorticate zones and curved spores; it differs from the southwestern species, *R. complanata* (Sw.) Ach. in lacking divaricatic acid. Hale also noted that there is a northern Great Lakes form with broad lobes that has been referred to as *R. subampliata*, but does not speculate as to what its valid name might be and this latter epithet is what we have used up until this treatment. Bowler & Rundel (1973) noted that Nylander originally described *R. fastigiata* var. *subampliata* as having lobes 6–12 mm wide, but they did

not explain why there "is no question that North American reports of *R. subampliata* are incorrect," or even how it differs from similar broad-lobed North American species. Lacking a decisively better name, we are exploiting the name *R. sinensis* for our rather smooth, broad-lobed species in Illinois. All of the Illinois and Southern Lake Michigan region material we have seen has laminal apothecia, straight spores, and lacks the decorticate zones and longitudinal ridges as seen in more northern or western material. [usnic acid]

Cook-ILL, DuPage-MOR, Kane-MICH, McHenry-ILL

RAMALINACEAE

A. Thallus either fruticose or parasitic on *Dermatocarpon*.
  Thallus with apothecia parasitic on the lower cortex of *Dermatocarpon*. . . . . **Toninia**
  Thallus fruticose, the apothecia on flattened branches. . . . . **Ramalina**
A. Thallus not fruticose.
  B. Thallus muscicolous. . . . . **Bilimbia**
  B. Thallus not muscicolous.
    Spores fusiform to acicular, rarely to 4 μm wide. . . . . **Bacidia**
    Spores ellipsoid to fusiform, usually at least 4 μm wide. . . . . **Lecania**

RHIZOCARPACEAE

One local genus. . . . . **Rhizocarpon**

RHIZOCARPON DC. RHIZOCARPACEAE [Photobiont: Chlorococcoid. Gr. *rhiza,* root + *karpos,* fruit; from what feature of the ascocarp is unclear. ~ Thallus crustose, epilithic, rimose to areolate; apothecia marginal or associated with the hypothallus, without a discernable margin; spores 8, hyaline to colored, septate to muriform.]

Rhizocarpon reductum Th. Fr. (L. *reductus,* restored, reformed, brought back to a previous condition) = *R. obscuratum* of local authors. A species of siliceous or base-poor rocks, it is yet unknown from the Southern Lake Michigan region. There is a specimen (Calkins #43, NY) collected presumably in northeastern Illinois; it was originally called *Pannaria nigra.* ~ Thallus thin, pallescent to grayish-brown, usually rimose; apothecia at least partly immersed, more or less pruinose, irregularly shaped, not particularly aggregated, the rim concolorous with the disk; spores 20 μm–35 μm × 10 μm–15 μm.

RHIZOPLACA Zopf LECANORACEAE [Photobiont: *Trebouxia.* Gr. *rhiza,* root + *plax*, a flat round plate, dish; perhaps from the roundish thallus sometimes attached by a short "root," or umbilicus. ~ Thallus areolate, to squamulose or umbilicate, yellow-green; the lower surface without rhizines; apothecia lecanorine, rather sumptuous and often crowded, the disks tan; spores 8, hyaline, simple, ellipsoid.]

Rhizoplaca subdiscrepans (Nyl.) R. Sant. (Gr. *sub-* below, slightly, imperfectly, nearly + *discrepans*, in disagreement; probably an allusion to the various opinions regarding its distinctness from *R. chrysoleuca* (Sm.) Zopf—which is more decidedly umbilicate and tends to have flatter thallus surfaces) Our only specimens are on sandstone breaks in our western sector. The thalli of all of our material, including that from southern Illinois, are characterized by crowded, stalked, bullate areoles (McCune, 1987), and are therefore referable to *R. subdiscrepans* (Nyl.) R. Sant. [pseudoplacodiolic acid and usnic acid]

LaSalle-MOR, Lee-MOR, Ogle-MOR

RINODINA (Ach.) Gray PHYSCIACEAE [Photobiont: *Trebouxia.* Gr. *rhine*, a file or rasp + *dinos*, rotation, eddy, a large round goblet or cup; perhaps from the apothecia and their often dry or rough-appearing disks. ~ Thallus crustose, obscure to continuous or areolate; apothecia sessile or subsessile, the margin thalline to not discernable; spores 8, brown, 1–2 septate; ellipsoid. As *Rinodina* spores pass maturity, they become very brown and much like *Buellia* spores. Look for the grayer spores that still display the characteristic lumen development. There is much variability in spore morphology accepted in the genus *Rinodina*. *Physcia*-type spores have strongly colored double-walled septem and thickened end walls; *Physconia*-type spores are similar but lack the notably thickened end walls; *Bischoffii*-type spores resemble *Physconia*-type spores, but are characterized by a bulge at the septum; *Mischoblastia*-type spores are characterized by anvil-shaped lumina in the cells and lack a darkened band at the septum; *Pachysporaria*-type spores are similar to the latter, but the quite rounded and lack the distinctive anvil shape. These spore types are nicely illustrated by Sheard (2010).

1. Thallus corticolous.
   2. Spores mostly 16 or more per ascus. . . . . R. POPULICOLA
   2 Spores 8 per ascus.
      3. Spores Physcia-type, with a darkened septum. . . . . R. FREYI
      3. Spores Pachysporaria-type, without a darkened septum.
         Spores prevailingly more less than 17.5 μm long; thallus rugose, dull, continuous, without blastidiate margins. . . . . R. PACHYSPERMA
         Spores prevailingly more than 17.5 μm long; thallus smooth, shiny, areolate, often blastidiate at the areole margins.. . . . . R. PAPILLATA
1. Thallus saxicolous.
   4. Substrata HCl+; spores bulging and thick-walled at the septum, characterized by a pigmented band around the middle. . . . . R. BISCHOFFII
   4. Substrate HCl-; spores not bulging at the septum, without a notable darkened band.
      5. Cortex K+ yellow (atranorin)
         Areoles less than 1 mm in diameter; spores prevailingly less than 20 μm long and 12 μm wide. . . . . R. OXYDATA
         Areoles most more than 1 mm in diameter; spores mostly more than 20 μm long and 12 μm wide . . . . . R. DESTITUTA

5. Cortex K-.
    6. Apothecia with a well-developed lecanorine margin; thallus often C+, KC+ pink. R. TEPHRASPIS
    6. Apothecia immersed or biatorine, or with a lecanorine margin; thallus K-, C-, KC-.
        Apothecia immersed, the thallus dark gray or gray brown; spores less than 23 μm long. . .. . R. CANA
        Apothecia with a thalloid margin, the thallus olive-brown; spores more than 23 μm long, often more than 30 μm long . . . . . R. ASCOCISCANA

Rinodina ascociscana (Tuck.) Tuck. (L. *ascos*, strong, nauseating + *cis*, the same side as + *canus*, gray or hoary; the allusion, if I have the word broken down properly, beyond me; possibly an allusion to its similarity to *R. cana*.) Our only record for this species is from a Calkins specimen (#88 NY) collected in LaSalle County. ~ Thallus shiny, olivaceous to brown, spores; spores 8 per ascus, *Physcia*-type, lacking a pigmented band at the septum, 23 μm–41 μm × 11 μm–17 μm. [no substances]

LaSalle-NY

Rinodina bischoffii (Hepp) A. Massal. (after Gottlieb Wilhelm Bischoff, 1797–1854, German botanist, lexicographer, and glossographer) Our only contemporary specimen is from a dolomitic outcrop in Boone County, where it grows with *Caloplaca sideritis, Circinaria contorta*, and *Verrucaria fayettensis*. Calkins (1896) reported this species from "calcareous rocks at Joliet and Lemont" and described it as a little-known species that occurred more abundantly farther south and west. A specimen at NY from La Salle County was identified accurately by Calkins as *R. bischoffii,* and it is indeed more frequent farther south and west, where it grows in limestone glades and on outcrops. ~ Thallus mostly endolithic; spores 8 per ascus, *Bischoffii*-type, with a distinctive, pigmented band at the septum, sometime producing a bulge, 15 μm–21 μm × 9 μm–12 μm. [no substances]

Boone-MOR, Cook, LaSalle-MOR,NY, Will

Rinodina cana (Arnold) Arnold (L. *canus,* gray, hoary, white, or appearing as if aged; probably from the color of the thallus) Occasional on granitic or sandstone boulders, or sometimes on chert in glades. Calkins (1986) reported a lichen he called *R. sophodes* (Ach.) Nyl. from boulders near Lemont and stated that he had never "met with it elsewhere so far north." He described it thus: "*Thallus gray or cinereo-fuscescent; apothecia small, appressed; disc flat, fuscous black; margin entire*." He may well have been referring to this species. John Sheard has annotated a specimen from central Illinois at NY, originally labeled as *R. sophodes,* as *R. cana.* ~ Thallus brownish to gray, areolate; apothecia essentially immersed; spores 8 per ascus, *Physcia*-type, 18 μm–22 μm × 9 μm–12 μm. [no substances]

Cook, DuPage-MOR, LaSalle-MOR, Will-MOR

Rinodina destituta (Nyl.) A. Zahlbr. (L. *destitutus*, forsaken, impecunious) Infrequent locally on granitic boulders in pastures, this species is widespread in the Midwest on numerous HCl– rocks. ~ Thallus epilithic, whitish, areolate, K+ yellow; apothecia subemersed, generally lacking a lecanorine margin; spores 8 per ascus, *Mischoblastia*-type, 20 μm–25 μm × 10 μm–14 μm. [atranorin]

Grundy-MOR, Kendall-MOR, LaSalle-MOR, McHenry-MOR

Rinodina freyi H. Magn. (in honor of the German lichenologist, Eduard Frey, 1888-1974, student of the lichen flora of the Alps) = *Rinodina glauca* Ropin. Our only records are from *Carya ovata* and *Populus tremuloides*. ~ Thallus granular-areolate, greenish-gray to brownish; apothecia sessile, generally crowded; spores 8 per ascus, *Physcia*-type, 14 μm–20 μm × 6 μm–9 μm, the septum very dark, but not bulging. [no substances]

Barry-MSC, Cook-MOR

Rinodina oxydata (Mass.) Mass. (Gr. *oxys,* sharp + *dateomai,* to divide; from the sharply divided spore lumina) Yet unknown from the Southern Lake Michigan region, it is well known in ambient districts on shaded HCl− rocks. ~ Thallus pale, rimose to areolate, smooth and discontinuous on rough surfaces, K+ yellow; apothecia prevailingly immersed; spores 8 per ascus, *Mischoblastia*-type, 19 μm–23 μm × 9 μm–12 μm. [atranorin]

Rinodina pachysperma H. Magn. (Gr. *pachus*, thick + *sperma*, seed) Our only record for this species is from a planted street tree, about 7" in diameter, of *Tilia cordifolia*. ~ Thallus grayish to brownish, continuous, dull, rugose or verrucose, not blastidiate, occasionally sorediate; apothecia prevailingly sessile; spores 8 per ascus, *Pachysporaria*-type, 15 μm–18 μm × 8 μm–11 μm.

Boone-MOR

Rinodina papillata H. Magn. (L. *papilla,* nipple, pimple + *atus,* an adjective ending; from the isidioid thallus) All of our records are from open-grown oak species in our western sector. ~ Thallus areoles shiny, more or less discontinuous, the margins with short-ciliate blastidia; apothecia rare; spores, 8 per ascus, *Pachysporaria*-type, 16 μm–19 μm × 9 μm–10 μm.

Lee-MOR, Winnebago-MOR

Rinodina populicola H. Magn. (*Populus* + *-cola,* dwell; from its frequent occurrence on *Populus*) This largely western species is known from as nearby as Champaign County, where it was collected on *Carya*. ~ Thallus areolate, grayish to brownish; apothecia aggregated, 0.4–0.7 mm across, the margins thick; spores 16-32 per ascus, *Physconia*-type, 11 μm–19 μm × 6 μm–9 μm.

Rinodina tephraspis (Tuck.) Herre (Gr. *tephros*, ash gray + *aspis*, heavy wooden, usually round shield or buckler) This species in infrequent on HCl− rock. ~ Thallus dull, verruculose to rimose-areolate, grayish to brownish; apothecia sessile, with a well-developed lecanorine margin; spores *Physcia*-type, 17 μm–24 μm × 8 μm–14 μm. [zeorin, ±5-0-methylhiasic acid, lecanoric acid.]

Grundy-MOR, Kendall-MOR

RUFOPLACA Arup, Søchting & Frödén TELOSCHISTACEAE [Photobiont: mostly *"Pseudotrebouxia."* L. rufus, reddish + Gr. *plax*, a flat round plate, dish; from the reddish apothecia, resembling plates; an unusually mixture of Latin and Greek roots. ~ Thallus crustose, rather dark, K–, saxicolous; apothecia yellow-orange, including the lecanorine rim, K+ magenta; sores 8, hyaline, polaribilocular, ellipsoid.]

Rufoplaca oxfordensis (Hedr.) Arup, Søchting & Frödén (Probably of Oxford, Ohio) = *Caloplaca oxfordensis* Hedr. Our only records of this species are from granitic boulders in open meadows or pastures. Wetmore (1996) maps this species in several counties just to the north and east of the Southern Lake Michigan region. ~ Thallus gray, rough-areolate, commonly invested with blue-green algae; apothecia 0.3–0.7 mm across, crowded and misshapen by compression, the disk orange to brownish, the margin yellower, lighter; spore 11 μm–15 μm × 5 μm–7 μm, the septum 2–3 μm wide. [thalloidima green]

Kane-MOR, LaSalle-MOR, McHenry-MOR, Winnebago-MOR

RUSAVSKIA S. Y. Kondr. & Kärnefelt TELOSCHISTACEAE [Photobiont: *Trebouxia.* In honor of Anna Ivanivna Rusavska, mother of the Ukranian lichenologist, Sergey Yakovich Kondratyuk (1959 –), the latter a student of *Xanthoria* and its relatives. ~ Thallus foliose, saxicolous, adnate, orange, the upper cortex K+ magenta, forming rosettes, with elongate often branched lobes; lower cortex white with white hapters; apothecia, if present, concolorous with the thallus; spores 8, hyaline, polaribilocular, ellipsoid; anthraquinones, particularly parietin.]

1. Thallus esorediate; apothecia abundant. . . . . R. ELEGANS
1. Thallus sorediate; apothecia absent. . . . . R. SOREDIATA

Rusavskia elegans (Link) S. Y. Kondr. & Kärnefelt (L. *elegans*, neat, elegant; from its comely appearance) = *Xanthoria elegans* (Link) Th. Fr. Commoner in northwestern Illinois, our only local records are from weathered concrete and dolomitic boulders.

Dekalb-MOR, Kenosha-MOR, Ogle-MOR, Rock-MOR,WIS

Rusavskia sorediata (Vain.) S. Y. Kondr. & Kärnefelt (Gr. *soredion*, a little heap + *-atus*, an adjective ending; from the conspicuous soredia) = *Xanthoria sorediata* (Vain.) Poelt. Yet unknown from the region, this western species has been collected as near as Rock Island County, Illinois, where it grows on a limestone cliff north of Hillsdale, and Iowa County, Wisconsin (Lindblom 1997).

SARCOGYNE Fée ACAROSPORACEAE [Photobiont: *Trebouxia* and *Myrmecia.* Gr. *sarx*, flesh + *gyne*, a woman; probably from the tendency of a moistened hymenium to turn red. ~ Thallus saxicolous, mostly endolithic, grayish; apothecia sessile, lecideine, the paraphyses unbranched; asci much thickened at the tip, the spores numerous, hyaline, simple, bacilliform.]

1. Thallus epilithic, white or sordid. . . . . S. ARENOSA
1. Thallus endolithic, or if epilithic then black.
    2. Thallus on carbonate-rich rock or concrete; apothecia usually at least thinly pruinose.. . . . S. REGULARIS
    2. Thallus on non-carbonate rock; apothecia epruinose.
        3. Many of the apothecia more than 1 mm across, round but many proliferating forming clusters with more angular shared borders.. . . . . S. SIMILIS

3. Apothecia or less than 1 mm across, round or angular, but not notably proliferous.
   Apothecia mostly more than 0.8 mm in diameter; hypothecium nigrescent. . . . . S. CLAVUS
   Apothecia generally asymmetrical or angular, prevailingly less than 0.8 mm in diameter; hypothecium hyaline. . . . . S. HYPOPHAEA

Sarcogyne arenosa (Herre) Knudsen & Standley (L. *arena*, sand + *-osus*, denoting full of or prone toward; evidently with a propensity to sand) Our only record for this western species is from a chert pebble on an eroded slope in full sun. ~ Thallus epilithic, continuous to areolate, brown to gray or pallescent; apothecia 1 per areole, emersed, round, 0.4–1.2 mm across, the disk black, reddish when wet, plane to convex, the margin disappearing in age; spores 3.5–4.9 μm × 1.0–1.5 μm.

DuPage-MOR

Sarcogyne clavus (DC.) Kremp. (L. *clava*, club; from the shape of the ascus) Yet unknown from the Southern Lake Michigan region, it is occasional in ambient districts. This is our only species with a dark-colored hymenium. ~ Thallus endolithic; apothecia black, reddish when wet, the carbonized margin thick, verrucose to wavy; spores 4–6 μm × 1.0–1.5 μm.

Sarcogyne hypophaea (Nyl.) Arnold. (Gr. *hypo*, under, beneath + *phaios*, dusky, dark gray) = *Lecanora privigna* (Ach.) Nyl. The *Lecanora cervina* of Calkins (1896) probably should be referred here inasmuch as he said it was scarcely distinguishable from *L. privigna* and that it grew on siliceous rocks. Calkins, however, attributed the pruinose forms of *privigna* to siliceous rocks, an observation that is contrary to what is generally observed. ~ Thallus endolithic or with pallescent fragments associated with the apothecia; apothecia irregularly shape 0.3–0.7 mm across, the disk reddish to nigrescent, redder when wet, the margin flexuous, undulate, often split or compressed; spores 3–5 μm × 1.0–2.0 μm.

Cook, Will

Sarcogyne regularis Körb. (L. *regularis*, regular; perhaps regarded by Körber to occur routinely) = *Biatorella pruinosa* Ach. Probably including *Lecanora privigna* var. *pruinosa* of Calkins. Occasional on a wide variety of carbonate-rich substrates, including tufa rock, gravel, concrete, shale, and exposed dolomite. Some specimens called "*Lecanora cervina*" by Calkins are referable here. ~ Thallus endolithic; apothecia abundant, occasionally immersed in the substrate, subcircular 0.2–1.0 mm across, the disk plane or convex, black, reddish when wet, usually blueish to blue-gray pruinose, the margin black, thin, persistent, often pruinose; spores 3–5 μm × 1.5–2.2 μm.

Barry-MICH, Cass-MOR, Cook-MOR, DuPage-MOR, Grundy-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-F,MOR,NY, McHenry-MOR, Racine-MOR, Walworth-MOR, White-MOR, Will-MOR

Sarcogyne similis H. Magn. (L. *similis*, similar or resembling, an adjective usually used to modify nouns in the genitive or dative cases) Our only record for this species is from a collection made on exposed sandstone at Castle Rock. It has an unfortunate resemblance to *Porpidia crustulata*, which see, from which it must be distinguished by the numerous tiny spores and the fact that the disk, as in all *Sarcogyne*, turns vinaceous when wet. ~ Thallus endolithic; apothecia nigrescent, 0.5–2.0 mm across, the disk, black, reddish when wet, plane

or convex, the margin black, smoothish to rough, crenulate, or splitting, tending to disappear as the disk becomes convex; spores 4–6 μm × 1.1–2.3 μm.

Ogle-MOR

SCLEROPHORA Chevall. CONIOCYBACEAE [Photobiont: *Trentepohlia*. Gr. *skleroun*, to harden + *phoros*, a bearing; the allusion not clear. ~ Thallus crustose, endophloedeal; apothecia stipitate, mazaedial, the spores numerous, hyaline, globose, often warty.]

Sclerophora nivea (Hoffm.) Tibell (L. *nivea*, snow white) Our only record is from "trees" in LaSalle County, where represented by an undated specimen of Calkins (#370), which he called *Coniocybe pallida*. Generally it grows in the crevices of dry bark.

LaSalle-CUP

SCOLICIOSPORACEAE

One local genus. . . . . **Scoliciosporum**

SCOLICIOSPORUM A. Massal. SCOLICIOSPORACEAE [Photobiont: Chlorococcoid, often forming goniocysts. Gr. *skolekos*, of a worm + *spora*, seed; from the elongate, curved spores. ~ Thallus crustose, obscure; apothecia rather small, becoming convex, brown to nigrescent, weakly lecideine; epithecium blue-green to brownish, the paraphyses narrowly clavate or not expanded; spores 8, hyaline, 3–7 septate, acicular, coiled in the ascus; conidia bacilliform to filiform.]

1. Thallus corticolous. . . . . S. CHLOROCOCCUM
1. Thallus saxicolous. . . . . S. UMBRINUM

Scoliciosporum chlorococcum (Stenh.) Vězda (Gr. *chloros*, green + *kokkos*, a kernel, grain; from the green granular thallus) = *Bacidia chlorococca* (Stenh.) Lettau. Infrequent on various corticolous substrates, including *Acer rubrum*, *Larix laricina, Pinus banksiana, Rhus typhina,* and *Tilia americana*. Armstrong (1977) reported *Bacidia chlorantha* (as "*B. chlorocantha*") from Du Page County, but her specimen is referable to this species. *B. chlorantha* (Tuck.) Fink is similar, but has more than 8 spores per ascus and conspicuous oil droplets in the hymenium. ~ Thallus dark green or greenish, granular, convex, the margin soon disappearing; spores slenderly clavate, 4–7 septate, 18–40 μm × 3–5 μm.

Allegan-MSC, Barry-MSC, Berrien-MIN,MOR,MSC, Calhoun-MSC, DuPage-MOR, Jasper-MOR, Kalamazoo-MIN,MSC, LaPorte-MIN,MOR, LaSalle-MOR, Ottawa-MSC, Porter-MIN,MOR

Scoliciosporum umbrinum (Ach.) Arnold (L. *umbros*, full of shade + *-inus*, pertaining to; probably from the dark color of the nigrescent thallus granules) Our only records for this species are from a granitic erratics in open pastures and on old stone walls. ~ Thallus grayish green, thin, continuous, verruculose; apothecia 0.2–0.7 mm across, soon convex, epruinose;

spores acicular, mostly 3-septate, spirally coiled in the ascus, strongly curved outside the ascus, 17–40 μm × 5.5–7 μm.

Barry-MSC, Jefferson-WIS, Kane-MOR, Winnebago-MOR

SCYTINIUM (Ach.) Gray COLLEMATACEAE [Photobiont: *Nostoc.* Gr. *skytos*, leather; + *-inus*, pertaining to; perhaps from the texture of the thallus. ~ Thallus subcrustose to minutely foliose or fruticose, gelatinous, lead-gray to brownish; apothecia lecanorine, laminal, sessile, the asci I+ blue at the tip; spores 8, hyaline, 2–11 septate, 1–3 muriform.]

1. Thallus minute, to 1 mm across, subcrustose. . . . . S. FRAGRANS
1. Thallus usually larger, more or less fruticose or foliose.
   2. Thallus lobes narrow, the margins finely dissected into dense isidioid or coralloid branches; lobe surfaces longitudinally wrinkled. . . . . S. LICHENOIDES
   2. Thallus without coralloid branches; lobes smooth.
      Thallus olivaceous to nigrescent, isidiate. . . . . S. DACTYLINUM
      Thallus dark gray to nigrescent, without isidia.
         Thallus olivaceous, the apothecia commonly broader than the linear lobes on which they are located. . . . . S. APALACHENSE
         Thallus dark gray to dark green, the apothecia sitting well within the area of the area of the more or less broad lobes. . . . . S. JUNIPERINUM

Scytinium apalachense (Tuck.) Nyl. (Of the Appalachian Mountains) = *Leptogium apalachense* (Tuck.) Nyl. Not yet known from our region, Lendemer & Harris (1916) map this largely southern species from as nearby as Fayette County, Iowa, where it grew on calcareous rock. ~ Thallus 1–3 cm across, comprising dichotomously branched, narrowly radiating lobes (0.4–1.0 cm ± 0.5–1.0 cm), the latter flat but notably thickened distally; apothecia abundant, immersed to sessile, 0.1–0.6 mm across, the rim concolorous with the thallus, the disk usually browner or redder; spores ellipsoid, 15–25 μm × 6–14 μm, 3–5 septate, 1-muriform.

Scytinium dactylinum (Tuck.) Otálora, P. M. Jørg. & Wedin (Gr. *daktylos*, a finger, toe + *-inus*, pertaining to; from the flattened isidioid marginal lobules that supposedly resemble fingers) = *Leptogium dactylinum* Tuck. Our only records for this species are from shaded, often mossy dolomitic exposures. There is a Calkins specimen at ILL (*LE*-175) from "Illinois" that he called *L. myochroum*, but it looks to us like *L. dactylinum*. ~ Thallus 2–3 cm across, the lead-gray to brownish or olivaceous, the squamuliform lobes 1–4 mm wide, the margins entire to isidiate, the surfaces isidiate; apothecia frequent, on the lobe surfaces, 0.2–1.2 mm across, the disk brown to reddish; spores 13–20 μm × 5–8 μm, 2–3 septate, 0–1 muriform.

Boone-MOR, DuPage-MOR, Kane-MOR, Kankakee-MOR

Scytinium fragrans (Sm.) Ach. (L. *fragrans*, sweet-smelling; an inexplicable epithet) = *Collema microphyllum* of Calkins, who recorded it from "elm bark; Cook and Will counties," and regarded it as rare. ~ Thallus minute, olivaceous to nigrescent, irregularly lobulate, the lobes minute, ascending, more or less imbricate, granulose near the center; apothecia 0.15–0.25 mm

across, numerous, often more than one on each lobule, the disk concave to flat, reddish, the lecanorine margin thick; spores spheroidal to ellipsoid, 10–21 μm × 7–11 μm, 1–3 septate, 1–2 muriform.

Cook, Will

Scytinium juniperinum (Tuck.) Otálora, P. M. Jørg. & Wedin (*Juniperus*, juniper + *-inus*, pertaining to; perhaps from a resemblance of the thallus folds to the imbricated juniper leaves) = *Leptogium juniperinum* Tuck. Rare throughout the state, one local record is from shaded, argillaceous, silty dolomite in a canyon along the Des Plaines River. The McHenry County record is admixed with *Peltigera rufescens* (Hyerczyk #2745, MOR) collected on gravelly soil alongside a hill prairie. The La Salle County collection is from moss patches on a wooded slope under *Pinus strobus*. ~ Thallus to 4 cm across, lead-gray to olivaceous or brown, paler beneath, attached to substrate by a tuft of hairs, the lobes imbricate, entire to lacerate or lobulate; apothecia frequent, on the surface, the disk brown to reddish, 0.2–2.0 mm across; spores 17–23 μm × 11–16 μm, 3-septate, 0–1 muriform.

DuPage-MOR, McHenry-MOR

Scytinium lichenoides (L.) Otálora, P. M. Jørg. & Wedin (Gr. *leichen*, a lichen + *-oideos*, form of, type; with the form of a lichen) = *Leptogium lichenoides* (L.) Zahlbr.; *L. lacerum* of Calkins, who reported it from elms, although elsewhere in the Midwest, this species typically occurs on carbonate rocks, often with the moss, *Anomodon rostratus*. Our only contemporary records are from a dolomitic outcrop on a north slope along the east bank of the Fox River and from partially shaded rocks at Carver-Roehl County Park. ~ Thallus grayish above, usually lighter beneath, 1–5 cm across, comprising numerous elongate to orbicularly lobes (1.0–4.0 mm wide), the margins entire to lobulate; apothecia infrequent, sessile, 0.2–0.7 mm across, the disk concave, brownish to reddish, the rim lobulate to isidioid, concolorous with thallus; spores 18–45 μm × 11–16 μm, 5–9 septate, 1–3 muriform.

Kane-MOR, LaSalle-F,ILL, Rock-WIS

SOLITARIA Arup, Søchting & Frödén TELOSCHISTACEAE [Photobiont: *Chlorococcus*-like, not *Trentepohlia*. L. *solitarius*, solitary, only one. ~ Thallus crustose, corticolous, continuous to areolate, chromate-yellow to grayish, K+ magenta, sorediate; apothecia rare, spores not seen; anthraquinones]

Solitaria chrysophthalma (Degel.) Arup, Søchting & Frödén (Gr. *chrysos,* gold + *ophthalmos,* the eye; probably from the deep golden orange apothecia on a pale yellow background) = *Caloplaca chrysophthalma* Degel. This attractive species is known from as far north in Illinois as Woodford County and as far south in Minnesota as Winona County, but it is yet unknown from the Southern Lake Michigan region.

SOLORINA Ach. PELTIGERACEAE [Photobiont: *Chlorococcus*-like, and or *Trebouxia*. Possibly from the Indonesian, volcanic island of Solor, or from the Latin verb, *solor*, which evokes feelings of comfort and east; allusion to either

theory is abstruse. ~ Thallus foliose, the lobes suberect, not adnate, greenish to brownish or gray; apothecia reddish to black, deeply sunken in the upper cortex; spores brown, 1-8, 2-celled; ellipsoid to fusiform.]

Solorina saccata (L.) Ach. (L. *saccatus*, having the form of a sack) Known from as nearby as Ozaukee County, Wisconsin, where it grows on carbonate-rich soil, or soil over limestone or dolomite, it is yet unknown from the Southern Lake Michigan region. ~ Apothecia nigrescent, the spores 4, very large.

SPILONEMA Bornet COCCOCARPIACEAE [Photobiont: *Stigonema*. Gr. *spilos*, spot or blemish + *nema*, a slender thread or tube. ~ Thallus minutely fruticose, nigrescent, the branches fruticose; apothecia black, concave, lecideine, the asci I+ blue at the tip, the spores 8, hyaline, simple, ellipsoid; conidia narrowly ellipsoid.]

Spilonema revertens Nyl. (L. *revertens*, returning, turning back; the allusion unclear) Our only record for this easily overlooked lichen is on a specimen in association with *Psorula rufonigra*, which is said to be lichenicolous upon it. Both grew together on a siliceous, exposed rock at Magnolia Bluff in nearby Rock County, Wisconsin. The minute much-branched thallus filaments, no more than 0.3 mm long, are black to dark brown, sometimes with a bluish black hypothallus evident.

SQUAMULEA Arup, Søchting & Frödén TELOSCHISTACEAE [Photobiont: mostly *"Pseudotrebouxia."* L. *squamula*, small lobe, lodicule. ~ Thallus and apothecia orange, K+ magenta; apothecia lecanorine, the rim nearly concolorous with the thallus, the disk often a little more orange; spores polaribilocular, the isthmus more than ⅓ as long as the spore. Anthraquinones, particularly parietin.]

Squamulea subsoluta (Wedd.) Arup, Søchting & Frödén (Gr. *sub-* below, slightly, imperfectly, nearly + *solutus*, unbound, free; from the more or less dispersed areoles) = *Caloplaca subsoluta* (Wedd.) Zahlbr. *Placodium cinnabarinum* of Calkins. As it was in Calkins's day, this is a frequent species of a variety of carbonate rocks, including concrete; it also can grow on HCl– rocks. It grows in weedy areas as well as on rocks in natural contexts. Occasional asci will be found with 1 or 2 spores that are larger than normal, but typically the 8-spored asci contain broadly ellipsoid spores 10–11 μm long, with isthmi 3–4 μm long. The apothecia rarely exceed 0.4 mm across, and mostly run about 0.2–0.3 mm across. This species was long known locally as *Caloplaca cinnabarina* (Ach.) Zahlbr., which is a more distinctly reddish and placoid species with a southwestern distribution. Local specimens also have been called *C. velana* (A. Massal.) Du Rietz, a name that might apply to another species.

Barry-MOR, Boone-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Jasper-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Koskiusko-MOR, LaGrange-MOR, Lake Il-MOR, LaSalle-CUP,MIN,MOR, McHenry-MOR, Noble-MOR, Racine-MOR, Rock-MOR, Steuben-MOR, Will-MOR

STAUROTHELE Norman VERRUCARIACEAE [Photobiont: *Stichococcus*. Gr. *stauros*, a cross + *thele*, a nipple) ~ Thallus endolithic to surficial; perithecium with endohymenial algae; spores muriform, brown, 2 per ascus.]

1. Thallus endolithic, on carbonate rocks. . . . . S. ELENKENII
1. Thallus surficial, areolate-rimose to rimose, on siliceous rocks. . . . . S. FISSA

Staurothele elenkenii Oxner (presumably after A. A. Elenken, about whom more information would be welcome) ~ Possibly overlooked, this is a western species of dry carbonate rocks. It was reported by (Thompson 1991) from Union County, Illinois. At first glance it might be passed off as a *Verrucaria*. ~ Thallus endolithic ; spores 32–62 μm × 18–33 μm. ~ Thallus scant or absent; perithecia 1 per verruculose areole, 0.5 mm in diameter, the involucrellum carbonaceous; hymenium I+ blue; spores 8 septate, 3-muriform, 33–62 μm × 18–33 μm.

Staurothele fissa (Taylor) Zwakh (L. *findere*, to split; possibly from the rimose thallus) A species of siliceous rocks, it is yet unknown from our region, but occurs all around the Southern Lake Michigan Region with specimens from as nearby as Fulton County, Illinois. ~ Thallus epilithic, black, verrucose-rimose; perithecia 0.3–0.5 mm in diameter, the hymenium I+ blue turning violet; spores many-celled, 30–50 μm × 14–25 μm.

STEREOCAULACEAE

A. Thallus leprose. . . . . **Lepraria**
A. Thallus fruticose. . . . . **Stereocaulon**

STEREOCAULON Hoffm. STEREOCAULACEAE [Photobiont: *Trebouxia* in the algal layer; *Gloeocapsa, Nostoc, Scytonema*, and *Stigonema* in the cephalodia. Gr. *stereos*, solid, firm + *kaulos*, stalk, stem; from the solid podetia. ~ Thallus white to pale gray, fruticose, with a granular but evanescent primary thallus; pseudopodetia with a cartilaginous core, erect, gregarious, well beset with verrucae, or pustular isidia-like granules, often secondarily coralloid-branched; apothecia biatorine brown to nigrescent; spores acicular, 8, hyaline, 3–7 septate, needle-like.]

Stereocaulon saxatile H. Magn. (L. *saxatilis*, among the rocks; from its rocky habitat) Our only contemporary records for this species are from a sandstone exposure in a grazed prairie east of Pine Rock Nature Preserve. [lobaric acid, atranorin]

Barry-MSC, Ogle-MOR

STICTIDACEAE

One local genus. . . . . **Conotrema**

STRANGOSPORA A. Massal. BIATORELLACEAE [Photobiont: Chlorococcoid. Gr. *strangalan*, choke, twist + *spora*, seed; the allusion is not clear to me. ~ Thallus crustose, thin to obscure; apothecia lecideine, the asci apically thickened and I+ blue; spores numerous, hyaline, simple, subglobose.]

Strangospsora cyphalea (Tuck.) Zahlbr. (Perhaps from Gr. *kyphos*, humped, curved + *aleo*, exposed to the sun; perhaps after the tiny convex apothecia on open-grown trees) = *Biatora cyphalea* Tuck. Magnusson (1934) cited a Wolf specimen from elm bark, and he also cited a Calkins specimen from elms, "Chicago: Fox River." Actually, Calkins (1896) reported it as "rare on elms near the Fox River," a location that is more likely in Kane County. Fink (1935) restricted this species to Illinois, but. For a comprehensive treatment of the biatorine lichens, see Morse & Lendemer (1919). ~ Thallus pale to grayish, granular to verrucose; apothecia 0.5–0.8 mm across, the disk reddish to brown, rim darker, soon disappearing; spores, 3–4 μm long × 2–3 μm wide.

Kane

STRIGULA Fr. STRIGULACEAE [Photobiont: *Trentepohlia.* L. *strigula,* a scraper, flesh brush; perhaps from the brushlike appearance of the hymenium. ~ Thallus crustose, immersed; perithecia black, the pseudoparaphyses unbranched; spores 8, hyaline, 1–8 septate to submuriform. Compare with *Anisomeridium*.]

1. Spores 6–8 celled. . . . . S. SUBMURIFORMIS
1. Spores fewer than 6-celled
   Spores 2-celled. . . . . S. AMERICANA
   Spores 4-celled. . . . . S. JAMESII

Strigula americana R. C. Harris (of America) Harris (1975) mapped this species from just west and south of the Southern Lake Michigan region. There are specimens from DuPage County on *Gleditsia triacanthos* and *Carya cordiformis*. We have a specimen from farther south in Illinois growing on *Quercus velutina. ~ Strigula americana* is 1-septate, narrowly fusiform, with unequal cells; related, is *S. jamesii*, which is 4-celled and known from districts east and west of the Southern Lake Michigan Region. Macroconidia cylindrical. ~ Spores 1-septate, 16–25 μm long × 4–5.5 μm wide.

DuPage-MOR

Strigula jamesii (Swinsc.) R. C. Harris (in honor of the British lichenologist, Peter James, 1930–2014, once a fixture at the Natural History Museum in London) Rare, or overlooked like most-septate, 15-21 μm long × 4.5–7 μm wide.

DuPage-MOR

Strigula submuriformis ®. C. Harris) R. C. Harris (L. *sub,* below, almost, near + *muriformis,* having the appearance of brick walls; from the occasional 1–2 muriform spores) Our only records for this species are from the bark of *Ulmus* and *Gleditsia* in park-like settings. Similar species, ***Strigula stigmatella*** (Ach.) R. C. Harris (Gr. *stigma*, mark or brand, dot or point + -*ellus*, diminutive; possibly from the tiny ascocarps), with mostly longer spores, is known from just north or our region and elsewhere not too distant; its spores are symmetrical, while those of S. submuriformis have a tendency to be a bit curved. ~ Spores 5–7 septate, 20–27 μm long × 6–6.5 μm wide, usually with one or two cells longitudinally septate; macroconidia cylindrical.

Ogle-MOR, Winnebago-MOR

STRIGULACEAE

One local genus. . . . . **Strigula**

TELOSCHISTES Norman (TELOSCHISTACEAE Photobiont: *Trebouxia.* Gr. *telos*, end + *schistos*, split, divided; from the polaribilocular spores, the two end cells divided and rendered remote by an isthmus. ~ Thallus fruticose, bushy from a central hapter, orange, K+ magenta, the branches flattened to terete; apothecia terminal, deep orange, abruptly flared, lecanorine; spores 8, hyaline, polaribilocular, ellipsoid.)

1. Apothecial margins ciliate.. . . . . T. CHRYSOPHTHALMUS
1. Apothecial margins eciliate.. . . . . T. EXILIS

Teloschistes chrysophthalmus (L.) Th. Fr. (Gr. *chrysos*, gold + *ophthalmos*, eye; from the deep yellow or orange apothecia, particularly primordial ones, against the grayish background of the thallus) = *Theloschistes chrysophthalmus* of Calkins. There is an early specimen at the Chicago Academy of Sciences, collected at Lemont by Calkins. He reported it from "Lemont, on old rails in woods" (Calkins 1896). Also on old oak trees near the lake shore, Lake View." Very rare today, there hav been recent collections made on an open grown trees in both aboriginal and cultural landscape situations. ~ Thallus branches flattened, often branched and fringed; apothecial margins fringed or ciliate. [parietin]

Allegan-MOR, Cook-F, DeKalb-MOR, DuPage-MOR, Kane-MOR, LaSalle-ILL,NY, Marshall-MOR

Teloschistes exilis (Michx.) Vainio (L. *exilis*, small, undersized) A rather improbable disjunction from farther south, it was collected locally on a small branch of a dead, cultivated tree *Pinus banksiana*. ~ Thallus branches narrowly flattened to terete; apothecial margins without cilia [parietin]

DuPage-MOR

TELOSCHISTACEAE

A.. Thallus fruticose to foliose or subcrustose, but at least the lobe tips elevated or loosely adnate.
  B. Rhizines abundant
    Thallus saxicolous. . . . . **Rusavskia**

Thallus corticolous, usually sorediate. . . . . **Xanthomendoza**

B. Rhizines absent or quite scarce.

Thallus fruticose. . . . . **Teloschistes**

Thallus foliose. . . . . **Xanthoria**

A. Thallus placoidioid and effigurate to subcrustose, all portions tightly adnate.

C. Apothecia scarce or absent.

D. Thallus lignicolous or corticolous

Thallus chromate yellow. . . . . **Solitaria**

Thallus orange. . . . . **Caloplaca**

D. Thallus saxicolous.

Thallus margins effigurate; soredia in soralia confined to the ends of the interior lobes. . . . . **Leproplaca**

Thallus not effigurate; soredia in poorly delimited soralia. . . . . **Flavoplaca**

C. Apothecia frequent.

E. Apothecia black; thallus white or gray.

Apothecia at least thinly pruinose. . . . . **Pyrenodesmia**

Apothecia without pruina. . . . . **Caloplaca**

E. Apothecia black or orange; thallus not white or if so then the apothecial disk orange or pale.

F. Rims of apothecia white, gray, or nigrescent, not yellow or orange, or if so then the thallus effigurate at the margin. . . . . **Caloplaca**

F. Rims of apothecia yellow or orange, or apothecia absent; thallus absent, areolate, squamulose, but never effigurate.

G. Thallus absent or essentially so (rarely with scant yellow, appressed patches); saxicolous; apothecia less than 0.3 mm across; isthmus no more than ⅓ as long as the spore. . . . . **Xanthocarpia**

G. Thallus present, or if absent then the apothecia corticolous or lignicolous and the spore isthmus more than ⅓ the length of the spore.

H. Thallus or apothecia K-.

Thallus corticolous. . . . . **Blastenia**

Thallus saxicolous. . . . . **Rufoplaca**

H. Thallus or apothecia K+ deep purple.

I. Thallus distinctly orange-tinged, paler than to concolorous with the apothecia. . . . . **Squamulea**

I. Thallus distinctly yellow, notably paler than the orange or brownish apothecia, or absent.

J. Thallus absent or of scattered, loosely appressed squamules. . . . . **Athallia**

J. Thallus obvious, more or less continuous.

Thallus sorediate. . . . . **Solitaria**

Thallus esorediate. . . . . **Gyalolechia**

THELIDIUM A. Massal. VERRUCARIACEAE [Photobiont: *Trebouxia* and *Protococcus*. Gr. *thele*, a nipple + *-idion*, diminutive; from the tiny perithecia. ~ Thallus crustose, saxicolous, on base-rich substrates, sordid to pale gray; perithecia superficial or immersed in pits, the asci I–; spores 8, hyaline, 1–3 septate, ellipsoid.]

Thelidium zwackhii (Hepp) A. Massal. (In honor of the German lichenologist Philipp Franz Wilhelm von Zwach-Holzhausen, 1826-1903) = Local reports of *Thelidium microcarpon.* Rather frequent on a variety of carbonate-rich substrates, include concrete, mortar, and pebbles. If our specimens are interpreted as having no involucrellum, which I think is the case, they would key to *T. microcarpum* (Leight.) A. L. Sm. in Orange (1991), who does not treat T. Zwackhii. In all likelihood, the specimen that Calkins called *Verrucaria pyrenophora* is referable here; although there is a specimen in Calkins's bound *Lichenes Exsiccati,* we have not examined it. There is also a specimen at F, that was distributed by Calkins (#199) as *Verrucaria prospersella*, which is referable here. ~ Thallus olivaceous, epilithic, thin, continuous to dispersed-areolate; perithecia 0.1-0.3 mm in diameter, superficial, with no evident involucrellum; spores 23–36 μm × 10–15 μm, slightly constricted at the septa.

Cook-MOR, DeKalb-MOR, DuPage-MOR, Kane-MOR, Lake In-MOR, Walworth-MOR, Will-MOR

THELOCARPACEAE

One local genus. . . . . **Thelocarpon**

THELOCARPON Hue THELOCARPACEAE [Photobiont: Chlorococcoid. Gr. *thele*, a nipple + *karpos*, fruit; from the tiny yellow apothecia evocative of nipples. ~ Thallus crustose, manifesting yellow or yellows globose warts; ascoma perithecia-like, opening at the distal end by a pore; paraphyses present or absent; asci subglobose to pyriform, with numerous, hyaline, simple, spores.]

Thelocarpon laureri (Flotow) Nyl. (after Johann Friedrich Laurer, 1798–1873, German pharmacist, physician, and lichenologist) One of our records is from a granitic erratic on a gravelly kame, another is from an old fence rail at the Lockport Prairie. The Porter County record was collected from a log of *Populus deltoides*. ~ Spores subglobose, 1.5–4.0 μm long × 1.5–2.0 μm wide. [pulvinic acid derivitives]

Cook-MOR, Kane-MOR, Lake Il-MOR, LaSalle-F,ILL, Livingston-MOR, Porter-INDU,MIN, Will-MOR

THELOTREMATACEAE

One local genus. . . . . **Diploschistes**

THROMBIACEAE

One local genus. . . . . **Thrombium**

THROMBIUM Wallr. THROMBIACEAE [Photobiont: Clorococcoid. L. *thrombus*, a blood clot or curd of milk; from the gelatinous, membranaceous form of the sprawling thallus. ~ Thallus crustose, scarcely discernable; perithecia immersed, globose, the wall black throughout, with persistent paraphyses; asci I+ blue apically; spores 8, hyaline, simple, ellipsoid.]

Thrombium epigaeum (Pers.) Wallr. (Gr. *epi*, above + *ge*, earth; from its membranous growth on the ground) Yet unknown from our area, it occurs in immediate districts all around the Souther Lake Michigan Region, where it grows upon compact soil, mosses, and associated detritus. ~ Asci subcylindric, 130–170 μm × 17–25 μm, the spores 18–26 μm × 7–10 μm.

THYREA A. Massal. LICHINACEAE [Photobiont: *Chroococcus.* Gr. *thyreos*, a large, oblong, door-shaped shield; from the form of the thallus. ~ Thallus fruticose to subfoliose, gelatinous, dark gray, with strap like branches or lobes; apothecia uncommon, immersed, generally marginal; spores 8, hyaline, simple, subglobose to ellipsoid; conidia ellipsoid to bacilliform.]

Thyrea confusa Henssen (L. *confusus*, confused) = *Omphalaria pulvinata* Nyl. Our only record is from thin soil over dolomite, in full sun, in a dolomite prairie. Calkins & Huett (1898) reported it from La Salle County. ~ Apothecia rare locally; spores, 7.5–10 μm long × 5–7.5 μm wide.

Will-MOR

TONINIA A. Massal. RAMALINACEAE [Photobiont: *Chlorococcoid* or absent. In honor of Carlo Tonini (1803-1877) a pharmacist in Verona, Italy, and friend of Abramo Bartolommeo Massalongo. ~ Thalli independent or lichenicolous; apothecia lecideine, black, spores 8, 0-7 septate, bacilliform.]

Toninia tecta C. A. Morse & Ladd (L. = hidden, covered; from its ignominious position beneath the thallus of its host, *Dermatocarpon*. A species primarily of the Great Plains, our only record is from the lower surface of a specimen of *Dermatocarpon muhlenbergii* at Kankakee River State Park, which represents the northern and eastern- most range extension limit. ~ The apothecia are characterized by their prevailingly 3-septate spores, greyish epihymenium, and rufous hypothecium. ~ Spores 1–3-septate, 14.0 μm –18.7 μm × 3.7 μm –5.0 μm.

Kankakee-MOR

TRAPELIA M. Choisy TRAPELIACEAE [Photobiont: Chlorococcoid, or with *Protococcus* and *Chlorella.* Gr. *trapelos*, easily turned, changeable; perhaps from the variable, irregular morphology of the exciple. ~ Thallus crustose, saxicolous, pale gray, areolate; apothecia sessile, brown to nigrescent, weakly lecanorine; asci I+ bluish apically; spores 8, hyaline, simple; ellipsoid.]

1. Thallus sorediate; apothecia rare. . . . . T. PLACODIOIDES
1. Thallus esorediate; apothecia usually present though rarely gregarious.
   Thallus thick, with rounded areoles or deeply rimose section, often more or less lobulate. T. GLEBULOSA
   Thallus thin, continuous to rimose, without lobules our rounded areoles. . . . . T. COARCTATA

Trapelia coarctata (Sm.) M. Choisy (L. *coarctatus*, confined, drawn close together, perhaps from the commonly cohering areoles) = *Biatora coarctata.* Most of our specimens are from granitic erratics or sandstone cobbles or outcrops, sometimes partly shaded. Calkins reported it from both calcareous and arenaceous rocks. ~ Thallus continuous to rimose or with flattish areoles; apothecia 0.3–0.6 mm across, occasionally more or less stipitate upon a hyaline base, the margins ragged or incomplete; spores 14 μm –25 μm × 7 μm –13 μm. [gyrophoric acid, lecanoric acid]

Berrien-MOR, Cook-MOR, DuPage-MOR, Jasper-MOR, LaSalle-F,ILL, Porter-MOR, St. Joseph IN-MOR, Will-MOR

Trapelia glebulosa (Sm.) J. R. Laundon (L. *glebulosus*, with rounded elevations, or clods) = *Trapelia involuta* (Tayl.) Hertel Our records are all from granitic erratics or sandstone, sometimes partly shaded. Wetmore (1986) reports it from Porter County. ~ Thallus areolate, with discontinuous, usually convex areoles, or with some coalesced to appear continuous, the margins not erumpent-ragged, soon disappearing as to make the ascoma appear biatorine; spores 14 μm –28 μm × 7 μm –13 μm. [gyrophoric acid, lecanoric acid, ± 5-*0*-methylhiascic acid]

LaSalle-NY, McHenry-MOR, Porter-MIN, Will-MOR

Trapelia placodioides Coppins & P. James (*Placodium* + *-oideos*, form shape; probably from a superficial resemblance to *Placodium*) Our only local records are from partly shaded igneous boulders in remnant savannas. ~ Thallus generally thick, continuous, white or with tinctures of pink, smooth to rimose or areolate, weakly placodioid in some specimens, the soralia at the margins of areoles of on the surface, reacting C+ red; apothecia not seen locally. [gyrophoric acid]

Berrien-MOR, Cook-MOR, DuPage-MOR, Kendall-MOR, Lake Il-MOR, LaSalle-MOR, McHenry-MOR

TRAPELIACEAE

A. Thallus saxicolous. . . . . **Trapelia**
A. Thallus not saxicolous.
Thallus greenish gray or grayish, with soredia erupting from verrucae. . . . . **Trapeliopsis**
Thallus greenish to nigrescent, esorediate, minutely granular, without verrucae and cortical tissues. . . . . **Placynthiella**

TRAPELIOPSIS Hertel & Gotth. Schneid. TRAPELIACEAE [Photobiont: Chlorococcoid and *Pseudochlorella.* ~ Schmitt and Lumbsch (2001) report the photobiont as *Chlorella ellipsoidea* Gerneck. *Trapelia* + Gr. *opsis*, aspect, view, appearance; a segregate of *Trapelia*, which see. ~ Thallus crustose, granular or areolate, gray or grayish green; apothecia lecideine or biatorine; spores 8, hyaline, simple, ellipsoid; conidia bacilliform.]

1. Apothecia plane, with persistent margins; thallus gray-green to dark green, thin. . . . . T. FLEXUOSA
1. Apothecia typically convex, the margins disappearing; thallus gray, thick and convex to granular warty. . . . . T. GRANULOSA

Trapeliopsis flexuosa (Fr.) Coppins & P. James (L. *flexuosus*, with many bends, winding; from forms of the thallus that sometimes passes into a wrinkled, areolate crust, a rare manifestation in the Southern Lake Michigan region and perhaps no longer attributable to this species) = *Lecidea flexuosa* (Fr.) Nyl.; *L. aeruginosa* Borrer. This species is occasional on decorticate logs, dead limbs, old wood, fence rails, burnt wood, and over moss; we have several records from the limbs of trees, including willows. ~ Thallus verruculose-areolate, sorediate, grayish green to olivaceous; apothecia 0.3–0.7 mm across, nigrescent; spores 6 μm –10 μm × 3 μm –4.5 μm. [gyrophoric acid]

Cook-MOR, DuPage-MOR, Ford-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Kane-MOR, Kendall-MOR, Lake Il-MIN,MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Newton-MOR, Porter-MIN, Walworth-MOR, Will-MOR, Winnebago-MOR

Trapeliopsis granulosa (Hoffm.) Lumbsch (L. *granulus*, a small grain + *-osus*, having the nature or quality of; from the granular thallus) = *Lecidea granulosa* (Ehrh.) Ach. This species grows on substrates similar to those of the preceding entry. It is also known locally from stable sand in sand prairies. Without seeing the specimens, of course, it is difficult to know where to dispose of Calkins's report of *L. enteroleuca* from Will County. From his description, however, it is probable that some of the material is referable here. Esslinger (2017)) noted that reports of *L. enteroleuca* often refer to what are now recognized as various species of *Lecidella*. ~ Thallus verruculose-areolate, sorediate, grayish to grayish-green; apothecia 0.4–10 mm across, variously pink to brown, or nigrescent; spores 14 μm –14 μm × 4 μm –7 μm. [gyrophoric acid]

Allegan-MICH,MSC, Barry-MSC, Berrien-MOR, DuPage-MOR, Jasper-MOR, Kalamazoo-MSC, Kane-MOR, Lake Il-MOR, LaPorte-MOR, McHenry-MOR, Porter-MOR, St. Joseph In-MOR, Starke-MOR, Waukesha-MOR, Will

TRIMMATOTHELOPSIS Zschacke ACAROSPORACEAE [Photobiont: Chlorococcoid. (Gr. *trimmatos,* something crushed + *thele,* nipple + *opsis*, appears as something; from the perithecium-like apothecium. ~ Thallus subsquamulose, saxicolous, brown; apothecia generally exposed through a shallow, nipple-like pore in the areoles; spores numerous, hyaline, simple.]

Trimmatothelopsis dispersa (H. Magn.) K. Knudsen & Lendemer (L. *dispersa*, scattered, dispersed) = *Acarospora dispersa* H. Magn. Rather frequent farther south, our only record is from the south exposure of a granitic boulder at the Nachusa Grasslands. ~ Spores cylindrical 5–5.5 μm × 2.0–2.3 μm.

Ogle-MOR

TRYPETHELIACEAE

A. Ascomata aggregated in raised warts. . . . . **Trypethelium**
A. Ascomata solitary, not aggregated in raised warts. . . . . **Julella**

TRYPETHELIUM Spreng. TRYPETHELIACEAE [Photobiont: *Trentepohlia.* (Gr. *trypa,* hole + *thele,* nipple; from the perithecia imbedded in the pseudostroma. ~ Thallus crustose, corticolous, thin but continuous, greenish gray or yellowish gray; perithecia black, aggregated in warty pseudostromata; spores 8, hyaline, 3–several septate, fusiform; conidia bacilliform.]

Trypethelium virens Michener. (L. *virens,* becoming green; from the color of the green, endophloeic thallus) = *Viridothelium virens* (Michener) Lücking, M. P. Nelsen, & Aptroot. We have yet to voucher mature ascocarps from the Southern Lake Michigan region, but we have seen thalli on beech trees and on *Carpinus* in Berrien County. Harris (1973) cites specimens from as nearby as Tippecanoe County, Indiana, and there are specimens from Ozaukee County, Wisconsin. ~ Spores 5–11 septate, the walls unevenly thickened, not muriform, 38 μm –52 μm × 7 μm –10 μm.

TUCKERMANELLA Essl. PARMELIACEAE [Photobiont: *Trebouxia.* Evidently an awkward derivation of Tuckermannopsis, which see, but with the wise choice to deploy only a single *n*. ~ Thallus foliose, brown, more or less adnate, the lobes short and branched, the upper cortex with elongate pseudocyphellae along the margins; lower cortex tan, sparsely rhizinate; apothecia laminal, lecanorine, the disks brown with warty margins; spores small, 8, hyaline, simple, ellipsoid; conidia bifusiform]

Tuckermanella fendleri (Nyl.) Essl. (in honor of Augustus Fendler, 1813-1883, Prussian born American collector of natural history collections, noted for his fine specimens, many of which perished either by fire or flood) Yet unknown from the Southern Lake Michigan region, this species is frequent in nearby districts ambient to Chicago.

TUCKERMANNOPSIS Gyeln. PARMELIACEAE [Photobiont: *Trebouxia.* An awkward attempt to honor Edward Tuckerman, 1817–1886, the noted American botanist. There being no genus "Tuckermannia," however, the *-opsis* suffix suggests that these lichens offer a resemblance to Dr. Tuckerman, which assertion may offend his relatives. Brodo (2016) provides only 1 *n*, while most authorities add an *n* to the name, perhaps to keep the antepenultimate syllable short. ~ Thallus foliose, most often with erect, folded, or ruffled lobes, brown, olivaceous, or greenish, pseudocyphellae sparse or absent; apothecia lecanorine, the disks brown, developed ventrally on the lobe margins; spores small, 8, hyaline, simple, ellipsoid; conidia bifusiform.]

1. Medulla UV–; marginal lobules often developed. . . . . T. ORBATA
1. Medulla UV+ bright white; marginal lobules absent. . . . . T. AMERICANA

Tuckermannopsis americana (Spreng.) Hale (of America) = *Cetraria ciliaris* of Calkins (1896), who reported it from "old rails in Lemont Township; on old birch at Glencoe." Thomson (2003) maps *C. halei* W. L. Culb. & C. F. Culb. from nearly throughout Wisconsin, local reports of which probably should be referred here. There are old specimens from Marshall and McHenry counties (A. W. B. *s.n.*, WIS; Willey #69, ILL), originally called *Cetraria ciliaris*, which are referable here. ~ Thallus lobes brown to olivaceous, the margins commonly with brown, simple or forked cilia; lower cortex sparsely rhizinate, generally rugose. [atranorin, alectoronic acid]

Barry-MSC, Calhoun-MSC, Cook, Kalamazoo-MSC, LaSalle-F, Marshall-WIS, McHenry-ILL

Tuckermannopsis orbata (Nyl.) M. J. Lai (L. *orbatus*, deprive of, of which feature I am not certain) The only local record for the region is from Tamarack at Otis Lake Bog in Barry County. Thomson (2003) maps it from as nearby as Jefferson County, Wisconsin, and we have seen an Illinois specimen from Effingham, from where it grew on *Quercus imbricaria*. ~ Thallus olivaceous to greenish, with ascending lobulate lobes, the margins notably pycnidiate; lower cortex pale brown, with pale scattered rhizines, rugose. [atranorin, protolichesterinic acid]

Barry-MICH, Jefferson

USNEA Adans. PARMELIACEAE [Photobiont: *Trebouxia.* Ar. *oshnah*, moss; from its superficial resemblance to mosses. ~ Thallus fruticose, prevailingly yellowish green, bushy or pendent, the branches terete or angled, often isidioid, soredioid, or with fibrilose excrescences, with a medullary core and cartilaginous central axis; apothecia lecanorine, the disks tan; spores small, 8, hyaline, simple, ellipsoid.]

1. Thallus distinctly pendent.
   - Branches strongly segmented with crest or winged, without white warts; medulla K+ red. U. ANGULATA
   - Branches round, beset with abundant white warts; medulla K- . . . . . U. CERATINA

1. Thallus not pendent.
   2. Cortex or medulla with tinctures of red; apothecia absent
      - Medulla red; stictic acid absent. . . . . U. MUTABILIS
      - Medulla white; stictic acid present. . . . . U. RUBICUNDA
   2. Cortex yellow green, without tinctures of red; stictic acid absent.
      3. Cortex nigrescent proximally; thallus with tufts of isidia. . . . . U. SUBFLORIDANA
      3. Cortex concolorous throughout; thallus without tufts of isidia.
         - Thallus branches angular or ridged in cross-section. . . . . U. HIRTA
         - Thallus branches terete in cross-section. . . . . U. STRIGOSA

Usnea angulata Ach. (L. *angulatus*, with corners or sharp angles) Our only records are old, collected prior to 1900. [usnic acid, norstictic acid]

Fulton-NY, LaSalle-F

Usnea ceratina Ach. (L. *ceratinus*, horny, or with horn-like projections) This species, sometime bushy, but often pendent occurs in districts ambient to the Southern Lake Michigan region, but we have seen no specimens. [usnic, diffractaic acid]

Usnea hirta (L.) F. H. Wigg. (L. *hirtus,* stiffly hairy; from the isidiose soredia) The only contemporary record we have seen is from a shrub of *Prunus americana* at Kankakee River State Park. There is a specimen from a Tamarack swamp at Pennfield Bog northeast of Battle Creek, Michigan. Thomson (2003) reports it from Walworth County. [usnic acid]

Barry-WIS, Calhoun-MSC, Kalamazoo-MSC, Kent-MSC,, Marshall-WIS, Walworth, Will-MOR

Usnea mutabilis Stirton (L. *mutabilis*, changeable) This species occurs in districts ambient to the Southern Lake Michigan region, but we have seen no specimens. [usnic acid]

Usnea rubicunda Strirton (L. = *rubicundus*, red, ruddy) There are specimens from as nearby as Dane County, Wisconsin, as well as from Illinois and Indiana farther south, but we have yet to discover it locally. [usnic acid, stictic acid, ±norstictic acid, ±salazinic acid]

Usnea strigosa (Ach.) Eaton (L. *strigosus*, thin, lean, meager; from the slender, stringy thallus) Calkins & Huett (1898) reported *Usnea barbata* and *Usnea barbata* var. *florida* from La Salle County; probably they both should be referred here. [usnic acid, ± norstictic acid, ± galbinic acid, ± fumarprotocetraric acid, ± psoromic acid]

DuPage-MOR, Marshall-WIS, Will-MOR

Usnea subfloridana Stirton (resembling *U. floridana*) Our only records for this species are from the branches of a large tree of *Quercus macrocarpa* and *Prunus serotina*. [usnic acid, squamatic acid]

Cook-MOR, Lake Il -MOR

USNOCETRARIA Nyl. PARMELIACEAE [Photobiont: Chlorococcoid. Evoking the idea of a *Cetraria* with usnic acid. ~ Thallus yellowish green, adnate, the lobes narrow, appearing more or less parallel and more or less concave, without pseudocyphellae, the medulla C–; lower cortex pale to white, sparsely rhizinate; apothecia rare; soredia elongate, along the lobe margins]

Usnocetraria oakesiana (Tuck.) M. J. Lai & J. C. Wei (In honor of the American lawyer and botanist, William Oakes, 1799–1848, who died young when he fell off a ferry boat between Boston and East Boston) Our only record for this species is from the bark of an adventive Lonicera shrub at English Prairie southeast of Kempton, Illinois. ~ Soralia farinose. This species resembles *Flavopunctelia soredica*, but the medulla of the latter is C+ red. [caperatic acid, lichesterinic acid, protolicesterinic acid, usnic acid]

Ford-ILLS

VARICELLARIA Nyl. PERTUSARIACEAE [Photobiont: Chlorococcoid. L. *varius*, pustule or pox + *-cella*, diminutive; evocative of small pox. ~ Thallus pale gray verruculose; apothecia lecanorine, wart-like; spores large, thick-walled, 1–8, hyaline, simple]

Varicellaria velata (Turner) Schmidt & Lumbsch (L. *vellus*, a veil, covering + *-atus*, adjective ending; from the apothecia covered by soredia) = *Pertusaria velata* (Turner) Nyl.

Calkins (1896) reported this species from both rocks and trees. Most of our specimens from southern Illinois are from oaks; all lack lichexanthone. ~ Thallus gray, with a narrow pale margin; apothecia with the disks heavily pruinose; spores 130–210 μm × 30–64 μm, the inner wall smooth. [lecanoric acid]

Allegan-MSC, Cook-MIN,NY,WIS, LaGrange-MOR, Milwaukee-MIL, Winnebago-MOR

VERRUCARIA Schrad. VERRUCARIACEAE [Photobiont: *Diplosphaera, Myrmecia,* and *Protococcus.* L. *verruca*, wart + *-arius*, like or connected with; from the wart-like appearance of the ascoma. We have little confidence that the specimens upon which the following names are based look much like their type material. ~ Thallus crustose, nearly prevailingly saxicolous, endolithic to thin and continuous to areolate or thickly rimose; perithecia immersed to subsurficial, black, the hamathecium without paraphyses, the hymenial gel I+ bluish, becoming orange; spores 8, hyaline to brownish, simple, ellipsoid.]

1. Areoles sorediate along the margins. . . . . V. MACROSTOMA
1. Areoles esorediate.
   2. Medulla black throughout, sumptuous; thallus thick, continuous to rimose.
      3. Thallus dark brown or nigresent; perithecia evident. . . . . V. NIGRESCENS
      3. Thallus pale to dark gray; perithecia immersed or evident at the surface.
         Areoles with more than 5 tiny black dots evident at the surface, the perithecia wholly immersed . . . . . V. FAYETTENSIS
         Areoles with fewer than 5 dots or ostioles, which represent partly emersed perithecia. . . . . V. FUSCELLA
   2. Medulla white or poorly developed; thallus thick, thin, continuous to rimose or areolate, or wholly epilithic.
      4. Thallus white, pale gray, absent, or endolithic.
         5. Spores mostly more than 12 μm wide; aquatic in clean-water springs. . . . . V. ELAEOMELAENA
         5. Spores rarely as much as 12 μm wide; not aquatic.
            6. Exciple black, fused to the involucrellum above, extending around the bottom of the perithecium. . . . . V. CALKINSIANA
            6. Exciple hyaline, the black involucrellum not completely encircling the perithecium.
               Thallus epilithic; apothecia to 0.25 mm across. . . . . V. ILLINOISENSIS
               Thallus endolithic; apothecia mostly more than 0.25 mm across. . . . . V. MURALIS
      4. Thallus brown to brown, olive, or nigrescent.
         7. Thallus smooth, very thin, continuous, the perithecia evidently surficial. . . . . V. SORDIDA
         7. Thallus thin to thick, not usually smooth throughout and continuous, rimose to areolate, the perithecia more or less immersed
            8. Many spores more than 25 μm long, usually halonate; thallus wet rocks in or along a stream . . . . . V. AETHIOBOLA
            8. Spores to 25 μm long, not halonate; thallus usually on dry rocks.
               Thallus surface rather rough and irregular; perithecia about half emersed, the ostioles evident. . . . . V. NIGRESCENTOIDEA
               Thallus surface warty, the perithecia wholly immersed, the surface without evident ostioles but, rather, with nigrescent areas flush with the thallus surface. . . . . .

Verrucaria aethiobola Wahlenb. (Gr. *aetho*, burnt, blackened + *bolos*, clod or lump; the allusion open to the imagination) There are several alleged records of this species from rocks in streams in LaSalle County, which we have not yet seen. Another aquatic calcicolous and related species, *Verrucaria margacea* (Wahlenb.) Wahlenb. (L. *marga*, marl; from its wet chalky substrate), in the northern Great Lakes area has generally larger, non-halonate spores. See also notes under *V. sordida*. ~ Asci clavate, the spores 25–30 μm × 10–12 μm.

LaSalle-FH, MICH,WIS

Verrucaria calkinsiana Servít (after Col. William Wirt Calkins, 1842–1914, American amateur mycologist and lichenologist) This is our most common *Verrucaria*. It grows on all manner of carbonate rocks, such as dolomite, limestone, weathered concrete, calcareous pebbles and cobbles, and even bone and tufa rock. The thallus can vary from appearing wholly endolithic to rather thick and creamy or sordid white, but a few cuts through the perithecia reveal a black, globular exciple. Usually, early collectors called this lichen *V. muralis* or *V. rupestris,* but occasionally it was called *V. pyrenophora* or *V. inundata.* ~ Asci clavate, 70–80 μm × 15–25 μm, the spores 18–25 μm × 8–12 μm.

Boone-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Grundy-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-F,NY, Lee-MOR, Livingston-MOR, McHenry-MOR, Ogle-MOR, Starke-MOR, Walworth-MOR, Will-MOR, Winnebago-MOR

Verrucaria elaeomelaena (A. Massal.) Arnold (Gr. *elaion,* oil + *melaina,* black; from the black perithecia heavily inspersed with oil droplets) This species is confined locally to the tufa runs and flats in our calcareous fens, where associates include *Carex sterilis, Eleocharis rostellata,* and *Rhynchospora capillacea.* Several herbaria (FH, MICH, WIS) have posted specimens of Verrucaria aethiobola Wahlenb., another semi-aquatic species, from LaSalle County—all Calkins specimens from slate or shale near Deer Park. It generally grows on siliceous substrates and has smaller spores; I am including it here until I have seen the specimens. See also notes under *Bacidia egenula* and *Verrucaria sordida*. ~ Spores 20–30 μm × 12–16 μm.

Kane-MOR, LaSalle-FH,MICH,WIS

Verrucaria fayettensis Servít (after Fayette County, Iowa) = *V. iowensis* Servít. This species is uncommon locally on weathered dolomite. It was most commonly called *V. fuscella* by early collectors, although Calkins called a Cook County specimen *V. viridula*. ~ Spores 11–14 μm × 6–7 μm.

Boone-MOR[with *Rinodina bischoffii*], Cook-F, DuPage-MOR, Grundy-MOR, McHenry-MOR, Ogle-MOR, Will-MOR,NY.

Verrucaria fuscella (Turner) Winch (L. *fuscus*, brown + *-ellus*, diminutive; from the color of the thallus) This species, if we are interpreting it properly, is rare, our only record being from a dolomitic outcrop in southeastern DuPage County. Fink (1906) reports it from an esker in Kane County. Navarro-Rosines *et al.* (2007) call this species *Placopyrenium fuscella* (Turner) Gueidan & Cl. Roux. ~ Asci clavate, 40–50 μm × 14–17 μm, the spores 12–16 μm × 5–7 μm.

Cook-MOR, DuPage-MOR, Kane

Verrucaria glaucovirens Grumman (L. *glaucus*, pale blue or whitish + *virens,* greenish; perhaps from the sometimes greenish brown color of the thallus) This is an occasional species from carbonate rocks. ~ Spores 17–21 μm × 8–10 μm.

Kane-MOR, Kenosha-MOR, Lake Il-MOR, McHenry-MOR

Verrucaria illinoisensis Servít (after the state of Illinois) This species was described from calcareous rocks in La Salle County by Servít (1950). One local record is a Calkins specimen from Riverside, in Cook County. Interestingly enough, he called this specimen *Verrucaria* (*Pyrenocollema*) *prospersella,* to which it has a superficial resemblance. We also have a specimen from weathered concrete in Cass County. It is known from a hill prairie in nearby Woodford County, Illinois. ~ Apothecia 0.2–0.25 mm across; periphyses 20–25 μm; spores 18–24 μm × 8–10 μm.

Cass-MOR, Cook-F, LaSalle-MOR,NY

Verrucaria macrostoma DC. (Gr. *makros,* long, large + *stoma,* mouth; presumably from an enlarged ostiole) Rare, our only local specimens are from carbonate rock. This is the name applied to Old World specimens that have areolate to subsquamulose, pale brown to olive-green thalli, sterile forms of which are sorediate along the margins of the areoles. Whether our specimens are this species is yet to be determined, but they strongly resemble the photograph in Dobson (1981) that has been called *V. tectorum auct.,* now regarded by Purvis *et al.* (1992) as a synonym of *V. macrostoma.* ~ Asci clavate, 85–105 μm × 25–30 μm, the spores 20–28 μm × 10–13 μm.

DuPage-MOR, Lake Il-MOR

Verrucaria muralis Ach. (L. *muralis*, growing on walls; from the habitat, often on rock walls) Including *V. rupestris* Schrad., which Esslinger (2016) recognizes as a distinct species. This species is occasional on a variety of carbonate-rich substrates, including weathered concrete, flagstone, and even small pebbles. It closely resembles V. calkinsiana, but the perithecia are generally more deeply imbedded in the substrate and there is scant if any epilithic thallus. ~ Apothecia 0.25–0.4 mm across; periphyses 30–60 μm; asci clavate, 65–75 μm × 16–22 μm, the spores 17–25 μm × 8–12 μm.

Cook-F-MOR, DuPage-MOR, Kenosha-MOR, Lake Il-MOR, Lake In-MOR, LaSalle-NY, McHenry-MOR, Porter-MIN, Will-MOR

Verrucaria nigrescens Pers. (L. *nigrescens*, blackening; from the color of the thallus) This species is rather frequent on carbonate-rich outcrops, pebbles, and erratics, although we have one record from a basaltic erratic. Calkins reported this species from limestone along streams, but several older specimens under this name we have referred elsewhere. Early specimens have been called *V. fuscella, V. viridula,* and even *Lecidea tessellata.* ~ Asci clavate, 70–90 μm × 20–30 μm, the spores 17–27 μm × 8–13 μm.

DuPage-MOR, Kendall-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Will-MOR

Verrucaria nigrescentoidea Fink (from *V. nigrescens*, + *-oideus*, form, type; resembling *Verrucaria nigrescens*) This species is occasional on a variety of carbonate-rich substrates. It resembles V. nigrescens in general appearance, but the hypothecium is white. ~ Spores 14–25 μm × 5–7.5 μm.

Cook-MOR, DuPage-MOR, Kane-MOR, Kankakee-MOR, Kenosha-MOR, McHenry-MOR, Racine-MOR, Winnebago-MOR

Verrucaria sordida Fink (L. *sordidus*, dirty, foul; from the dirty brown color of the thallus) Uncommon locally, this species occurs on carbonate-rich rock, although we have a specimen from a chert pebble in Ralls County, Missouri that looks like this species. This appears to be a little-known species, and we are calling it *V. sordida*, not particularly because it closely fits Fink's description, but because it looks like specimens we have seen that Fink himself called *V. sordida*. Many of the specimens Calkins called *V. aethiobola* are referable here. We are also referring here a specimen (NY) he called *V. nigrescens*. It somewhat resembles *V. nigrescentoidea*, but the latter has a notably thicker thallus. ~ Thallus partly, sordid, smoothish; apothecia 0.15–0.25 mm across, the ostiole minute; hypothecium pale; asci clavate to variously shaped, the spores 16–22 μm × 9–12 μm.

Berrien-MOR, Cook-NY, DuPage-MOR, Kane-MOR, Kendall-MOR, Koskiusko-MOR, LaSalle-MOR, Walworth-MOR, Winnebego-MOR

VERRUCARIACEAE

A. Perithecia always absent.
  Thallus leprose. . . . **Botryolepraria**
  Thallus squamulose. . . . **Agonimia**
A. Perithecia usually present.
  B. Spores simple.
    C. Thallus umbilicate or squamulose, terricolous or saxicolous
      Thallus umbilicate, saxicolous. . . . **Dermatocarpon**
      Thallus squamulose, terricolous. . . . **Placidium**
    C. Thallus crustose or absent, the ascomata lichenicolous.
      D. Ascomata lichenicolous in the apothecia of Teloschistaceous lichens. . . . **Muellerella**
      D. Ascomata not lichenicolous.
        Perithecia deeply imbedded in the substrate; saxicolous. . . . **Baglietto**a
        Perithecia epilithic or only partially immersed in the substrate. . . . **Verrucaria**
  B. Spores septate or muriform.
    E. Spores abundantly muriform.
      F. Spores 4-8 per ascus. . . . **Willeya**
      F. Spores 2 per ascus.
        Spores hyaline in the ascus. . . . **Endocarpon**
        Spores brown in the ascus. . . . **Staurothele**
    E. Spores not septate or with a few transverse septa.
      G. Ascospore strictly 1–septate. . . . **Placidiopsis**
      G. Many of the ascospores more than 1–septate.
        Thallus lignicolous. . . . **Psoroglaena**
        Thallus saxicolous. . . . **Thelidium**

WILLEYA Müll. Arg. VERRUCARIACEAE [Photobiont: *Stichococcus, Protococcus,* and *Myrmecia.* In honor of the New England newspaper editor and lichenologist, Henry Willey, 1824-1907, productive but rather eccentric student of Edward Tuckerman.] ~ Thallus crustose, well developed, grayish to brown;

perithecia immersed or emergent; asci with algae in the hymenial gel; spores muriform, 4–8, hyaline. According to Morse & Ladd (2019) there are 8-spored species in *Staurothele*, so I am still unclear as to how one distinguishes fundamentally it from Willeya.

Willeya diffractella (Nyl.) Müll. Arg. (L. *dis-*, away from + *fractus*, broken + *-ella*, diminutive; probably from the tendency of the thallus to break up into small, sometimes remote areoles) = *Endocarpon diffractellum* (Nyl.) Gueidan & Cl. Roux; *Staurothele diffractella* (Nyl.) Tuck. Uncommon locally on shaded or sheltered dolomitic boulders or cliff faces as well as siliceous rock. ~ Thallus gray to grayish-brown; spores hyaline, 15–28 μm × 9–12 μm.

Cook-MOR, DuPage-MOR, Kankakee-MOR, LaSalle-NY

XANTHOCARPIA A. Massal. & De Not. (TELOSCHISTACEAE Photobiont: mostly "*Pseudotrebouxia*.". Gr. *xanthos*, the various shades of yellow + karpos, fruit. ~ Thallus crustose, mostly endolithic; apothecia lecanorine, K+ magenta; spores 8, hyaline, polaribilocular, the isthmus no more than ⅓ the length; anthraquinones, particularly parietin.)

1. Disks of apothecia clear yellow or yellowish-orange, not much darker than the rim. . . . . X. CRENULATELLA
1. Disks of apothecia burnt orange, notably darker than the bright yellow rims. . . . . X. FERACISSIMA

Xanthocarpia crenulatella (Nyl.) Frödén, Arup & Søchting (L. *crenulata*, having small rounded teeth + *-ellus*, diminutive.) = *Caloplaca crenulatella* (Nyl.) H. Oliver. Frequent on base-rich rock, including weathered concrete, dolomite, slag, gravel, and occasionally on granitic erratics. It can occur with *Xanthocarpia feracissima*, particularly on weathered concrete.

Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Ford-MOR, Fulton-MOR, Iroquois-MOR, Jasper-MOR, Kane-MOR, Kendall-MOR, Koskiusko-MOR, Lake IL-MOR, McHenry-MOR, Milwaukee-MOR, Ogle-MOR, Ottawa-MO, Rock-MOR, St.Joseph IN-MOR, White-MOR, Will-MOR

Xanthocarpia feracissima (H. Magn.) Frödén, Arup & Søchting (L. *ferax*, rich, fertile + *-issimus*, superlative suffix; from the masses of tiny yellow apothecia) = *Caloplaca feracissima* H. Magn. This species accounts for most of the dirty yellow incrustations on sidewalks, flagstones, and weathered concrete. It grows routinely with *Endocarpon petrolepideum* and *Myriolecis dispersa*. Occasional specimens have paraphyses in which the terminal 1 or 2 cells expand to 7 or 8 μm, said to be characteristic of *Xanthocarpia lactea* (A. Massal.) A. Massal. (L. *lacteus*, milky), but so many of our specimens grade from 3 to 6 μm in this respect that it seems there is no discontinuous segregation. The reports of *Caloplaca arenaria* by McKnight, Wilhelm, & Whiteside (1987) are referable here. Rarely, the apothecia are closely associated with the parasitic fungus, *Thelidiella blastenicola* Fink, which is characterized by black, globular or subconic, scarcely ostiolate, perithecia.

Benton-MOR, Berrien-MOR, Boone-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kalamazoo-MSC, Kane-MOR, Kenosha-MOR, Koskiusko-MOR, Lake IL-MOR, Lake IN-MOR, LaSalle-MOR,NY, Lee-MOR, Livingston-MOR, Marshall-WIS, Milwaukee-MOR, Newton-MOR, Ogle-MOR, Ottawa-MOR, Porter-MOR, Racine-MOR, Rock-

MOR,WIS, St. Joseph IN-MOR, Steuben-MOR Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

XANTHOMENDOZA S. Y. Kondr. & Kärnefelt TELOSCHISTACEAE [Photobiont: *Trebouxia.* Gr. *xanthos,* the various shades of yellow + (evidently) Mendoza, a town in Argentina; seemingly an awkward constriction, since I do not think that there is a genus Mendoza, certain jumping spiders notwithstanding. ~ Thallus minutely foliose or suffruticose, orange, K+ magenta, much branched; lower cortex white, rhizines evident or lacking; spores 8, hyaline, polaribilocular; anthraquinones, particularly parietin.]

1. Thallus esorediate. . . . . X. HASSEANA
1. Thallus sorediate.
    2. Thallus lobes dichotomously branched, all long and narrow, the ultimate lobes notably longer than broad . . . . . X. WEBERI
    2. Thallus lobes irregularly palmately to flabellate-lobed, the ultimate lobes about as long as broad.
        3. Soredia fine, often greenish-yellow, confined to soralia formed at openings or slits between the upper and lower cortices, often between major lobe segments; larger lobes commonly more than 0.7 mm broad. . . . . X. FALLAX
        3. Soredia fine to granular, always yellow-orange, in marginal soralia or on the distal portions of the lobes and lower cortex; thallus lobes more or less than 0.7 mm broad.
            4. Soredia in marginal or even discrete laminal soralia, not produced along the distal portions of the lower surface; lobes often more than 0.5 mm broad orange; pimple-like pycnidia rare; thallus with the distinct tincture of ochre. . . . . X. ULOPHYLLODES
            4. Soredia mostly along the lobe margins and extending in decorticate arrays beneath the lobe tips; lobes less than 0.5 mm broad; pycnidia frequent, appearing pimple-like on the upper surface; thallus distinctly orange.
                Soralia formed in the open cavity of hook-like or helmet-like lobe tips.. . X. GALERICULATA
                Lobe tips flat or more or less crowned, but not helmet-like. . . . . X. FULVA

Xanthomendoza fallax (Arnold) Søchting, Kärnefelt & S. Y. Kondr. (L. *fallax*, deceptive; probably from its superficial resemblance to other species) = *Xanthoria fallax* (Arnold) Arnold. Frequent, more than half of our specimens are from fast-growing roadside trees such as *Acer platanoides, Populus deltoides, Fraxinus* spp., and *Ulmus* spp. It also grows on open-grown oaks and walnuts, as well as on weathered fence rails. A frequent associate is *Candelaria concolor*. Other associates include *Hyperphyscia adglutinata, Phaeophyscia ciliata, Physcia millegrana, Xanthomendoza fulva*, and *Xanthomendoza ulophyllodes*. Several local reports of this species have been misidentifications of *Xanthomendoza ulophyllodes*.

Allegan-MOR, Barry-MOR, Benton-MOR, Berrien-MOR, Boone-MOR, Calhoun-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kenosha-MOR, Kent-MOR, Kosciusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake IN-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, Livingston-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Porter-MIN,MOR, Pulaski-MOR, Rock-MOR, Starke-MOR, Steuben-MOR, Van Buren-MOR, Walworth-MOR, Waukesha-MOR, White-MOR, Will-MOR, Winnebago-MOR

Xanthomendoza fulva (Hoffm.) Søchting, Kärnefelt & S. Y. Kondr. (L. *fulvus,* reddish yellow, from the conspicuous pycnidia) Frequent on open-grown corticolous substrates as well as both siliceous and carbonate rock. A frequent associate is *Candelaria concolor.* ~ As we are interpreting it, this is perhaps the more variable of our species in the genus, as we are interpreting it. It is characterized as having very narrow lobes that tend to dilate distally into a flabelliform array of lobules no more than twice as long as wide. See also the comments under *Xanthomendoza weberi*.

Allegan-MOR, Barry-MOR, Benton-MOR, Boone-MOR, Cass-MOR, Cook-MOR, DeKalb-MOR, Elkhart-MOR, Ford-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kankakee-MOR, Kosciusko-MOR, Lake IL-MOR, Lake-IN-MOR, LaSalle-MOR, Lee-MOR, LaPorte-MOR, Marshall-MOR, McHenry-MOR, Milwaukee-MOR, Newton-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Pulaski-MOR, Rock-MOR, Steuben-MOR, Van Buren-MOR, Waukesha-MOR, White-MOR, Winnebago-MOR

Xanthomendoza galericulata L. Lindblom (L. *galericulatus*, shaped like a hood) Rare, our only records are from corticolous substrates, commonly with other species of *Xanthomendoza*.

DeKalb-MOR, DuPage-MOR, Kenosha-MOR, Lake-IN -MOR, Will-MOR

Xanthomendoza hasseana (Räsänen) Søchting, Kärnefelt & S. Y. Kondr. (in honor of the American lichenologist, Hermann Edward Hasse, 1836-1915, who produced the "Lichens of Southern California") = *Theloschistes lychneus* of Calkins; local reports of *Xanthoria polycarpa* and *Polycauliona polycarpa*. This species is rather infrequent on fallen branches and on trees in cultural landscape settings.

Allegan-MOR,MSC, Berrien-MOR, Cass-MOR, Cook-FH,ILL,MOR, DeKalb-MOR, DuPage-MOR, Grundy-MOR, Jefferson-MOR, Kane-MOR, Kenosha-MOR, Lake Il-MOR, LaSalle-NY, Marshall-MOR, McHenry-ILL-MOR, Porter-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

Xanthomendoza ulophyllodes (Räsänen) Søchting, Kärnefelt & S. Y. Kondr. (Gr. *ulo,* a scar, curly + *phyll,* leaf + *ode,* like) = *Xanthoria ulophyllodes* Räsänen This species is common on a wide variety of corticolous substrates, mostly in disturbed areas. It also grows on exposed dolomitic boulders and concrete. Frequent associates include *Candelaria concolor, Physcia millegrana, Physcia stellaris*, and *Xanthomendoza fallax*. The St. Joseph County, Indiana, record is on the same card as *X. fallax*.

Barry-MOR, Calhoun-MOR, Cook-MOR, DeKalb-MOR, DuPage-MOR, Fulton-MOR, Grundy-MOR, Jasper-MOR, Jefferson-MOR, Kane-MOR, Kenosha-MOR, Lake IN-MOR, Lake IN-MOR, Lee-MOR, Livingston-MOR, McHenry-MOR, Milwaukee-MOR, Ogle-MOR, Porter-MIN, Racine-MOR, St. Joseph IN-MOR, Starke-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR

Xanthomendoza weberi (S. Y. Kondr. & Kärnefelt) L. Lindblom (in honor of the American lichenologist, William Alfred Weber, 1918– , prolific student of lichens and professor at the University of Colorado at Boulder) This species is occasional on corticolous substrates, particularly oaks and on and carbonate rocks, but we also have specimens from weathered wood. ~ This species is perhaps no more than varietally distinct locally from *Xanthomendoza fulva*. As we are interpreting this species, it differs in having the ultimately lobes longer than wide and nearly without a tendency to dilate distally, none of the lobes more than 0.2 mm wide.

Allegan-MOR, Barry-MOR, Cass-MOR, DeKalb-MOR, DuPage-MOR, Fulton-MOR, Grundy-MOR, Iroquois-MOR, Kosciusko-MOR, Lake Il-MOR, Lake IN-MOR, McHenry-MOR, Ogle-MOR, Porter-MOR, Pulaski-MOR, Rock-MOR, Steuben-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

XANTHOPARMELIA (Vain.) Hale PARMELIACEAE [Photobiont: *Trebouxia.* Gr. *xanthos*, the various shades of yellow + *Parmelia*; a segregate genus of *Parmelia*, which see, with strong tints of yellow. ~ Thallus foliose, rather large but adnate, yellow-green; lower cortex white to tan to brown or black; apothecia, if present, sessile, lecanorine, the disks brown; spores 8, hyaline, simple, ellipsoid; conidia bacilliform to variously fusiform; usnic acid]

1. Thallus without isidia.
   2. Thallus jet black below except near the margins.
      Medulla K–. . . . . X. HYPOMELAENA
      Medulla K+ yellow to red. . . . . X. HYPOFUSCA
   2. Thallus tan to brown below.
      Salazinic acid present; medulla K+ red. . . . . X. VIRIDULOUMBRINA
      Salazinic acid absent; medulla K+ yellow or very slowly turning reddish yellow. X. CUMBERLANDIA
1. Thallus isidiate.
   3. Medulla K–. . . . . X. SUBRAMIGERA
   3. Medulla K+ yellow or red.
      4. Lower cortex black except near the margins
         Medulla K+ yellow turning red. . . . . X. AUSTRALASICA
         Medulla K+ yellow, or yellow turning slowly to reddish. . . . . X. CONSPERSA
      4. Lower cortex tan or brown nearly throughout.
         Salazinic acid present. . . . . X. MEXICANA
         Salazinic acid absent. . . . . X. PLITTII

Xanthoparmelia australasica D. Galloway (of southern Asia) = *Parmelia conspersa* of Calkins (1896), who indicated that his specimens were often isidiate, "fuscous-black" beneath, and grew on stones in Lemont and Will County. We have taken the liberty of including these reports here inasmuch as all modern records of isidiate morphs with black lower surfaces in northern Illinois are referable to *X. australasica.* Recent specimens of this species have been collected in nearby Ogle County on sandstone outcrops in open pasture west of Pine Rock Nature Preserve. Calkins's assertion that it grew on old wood near Elgin would represent a rare observation today. This species was called *X. tinctina* (Maheu & A. Gillet) Hale *in* Hale (1979). [usnic acid, salazinic acid, norstictic acid]

Cook, Ogle-MOR, Will

Xanthoparmelia conspersa (Ach.) Hale (L. *conspersus*, thickly and regularly aggregated) Yet unknown from the Southern Lake Michigan region, it is rather frequent in districts south and north. There is a report of a specimen from the bark of *Quercus velutina* (Hale #1024 WIS) in Waukesha County, determined by J. W. Thomson. A little farther north there is a record from a quartzite boulder. [usnic acid, stictic acid, with traces of constictic, cryptostictic, norstictic, and connorstictic acids, ± traces of hyposalazinic acid.]

Xanthoparmelia cumberlandia (Gyeln.) Hale (after Cumberland, Maine, in the United States) Perhaps Berry's (1941) report (Cheney #3485, WIS) of *Parmelia conspersa* should be referred here. This is the more frequent *Xanthoparmelia* locally. It grow on siliceous rock, usually in the open [usnic acid, stictic acid, norstictic acid]

Berrien-MSC, Cook-MOR, Ford-MOR, Grundy-MOR, Kankakee-MOR, LaSalle-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR, Will-MOR, Winnebago-MOR

Xanthoparmelia hypofusca (Gyeln.) Hodkinson & Lendemer (Gr. *hypo-* under, beneath + L. *fusca*, dark-colored—an awkward mixture of Greek and Latin in allusion to the black lower cortex) = *X. tasmanica* of local authors. This species, common in southern Illinois and the Missouri Ozarks, is recorded from as nearby as Sauk County, Wisconsin. ~ With this species the thallus is loosely attached and easily removed from the rock; a similar species, also K+ (norstictic and stictic acids), *X. angustiphylla* (Gyeln.) Hale (L. *angustus*, narrow + Gr. *phylla*, leaf) is too tightly adherent to the rock to remove easily. [usnic, salazinic, norstictic acids]

Xanthoparmelia hypomelaena (Hale) Hale (Gr. *hypo*, under, beneath, less than usual + *melaina*, black; from the color of the lower cortex) Our only record of this species is from a west-facing basalt boulder nestled in the bank of a drainage way in a pastured valley on the Waish Kee Shaw Reservation. [usnic acid, fumarprotocetraric acid]

Kendall-MOR

Xanthoparmelia mexicana (Gyeln.) Hale (of Mexico) This species is rather frequent in our western sector, where it grows on sandstone and granite. [usnic acid, salazinic acid, norstictic acid]

Kane-MOR, LaSalle-MOR, Lee-MOR, McHenry-MOR, Ogle-MOR

Xanthoparmelia plittii (Gyeln.) Hale (In honor of the American botanist and lichenologist, Charles Christian Plitt, 1869–1933) This species is infrequent on sandstone and on granitic erratics and tombstones. [usnic acid, stictic acid]

Barry-MICH,MSC, Fulton-MOR, LaSalle-MOR, Ogle-MOR, Pulaski-MOR, Rock-MOR, Waukesha-MOR

Xanthoparmelia subramigera (Gyeln.) Hale (L. *sub-* below, slightly, imperfectly, nearly + *ramus*, branch + *gero*, to carry, bear; from the branched thallus) This species, common in southern Illinois, but our only local collection is from a granite boulder south of Sheridan along the Fox River. [usnic acid, fumarprotocetraric acid]

Xanthoparmelia viriduloumbrina (Gyelnik) Lendemer (L. *viridis*, green + *ulus*, diminutive + *umbrina*, full of shade) = *X. somloënsis* (Gyeln.) Hale Rare, the Will County record is from a granitic boulder along the Dr. Zales Nature Trail at Joliet Junior College; the Ogle County record is from a massive sandstone exposure. [usnic acid, salazinic acid, norstictic acid. Previous reports of *X. stenophylla* (Ach.) Ahti & D. Hawksw. (Gr. *stenos*, short + *phyllon*, leaf) are referable here.

Ogle-MOR, Will-MOR

XANTHOPYRENACEAE

One local genus. . . . . **Pyrenocollema**

XANTHORIA (Fr.) Th. Fr. TELOSCHISTACEAE [Photobiont: *Trebouxia.* Gr. *xanthos,* the various shades of yellow + L. *orius,* a place suitable for something; from yellow portion of the spectrum. ~ Thallus foliose, K+ magenta, adnate, the lower cortex white, without rhizines; apothecia lecanorine, the disks usually a deeper orange than the thalline rims; spores 8, hyaline, polaribilocular; anthraquinones, particularly parietin.]

Xanthoria parietina (L.) Th. Fr. (L. *parietis*, of a wall + *inus*, pertaining to; from its tendency to grow on walls) = *Theloschistes parietinus* of Calkins. A maritime species, this lichen is generally rare in the Midwest. There is a specimen of Calkins's from Cook County at the Chicago Academy of Sciences, which is correctly identified, but Another early Cook County specimen (Calkins #16 NY), originally called *X. parietina,* is referable to *Xanthomendoza hasseana.* He (1896) treated it casually, stating that it grew "along the lake shore, on oaks and poplars; also in Lemont and elsewhere." Rudolph (1955) also reports it from Cook County. Interestingly, Tuckerman (1860) reported it from Kendall County, well removed from Lake Michigan. In recent years it as begun to appear on planted trees in corporate campus or landscape settings, inevitably on young landscape trees with smooth bark. By the time a tree once rich with it grows to 7 or 8 inches in diameter, the thalli have disappeared. Trees upon which we have collected it include *Acer platanoides, Acer rubrum, Acer saccharum, Carpinus, Celtis occidentalis, Cercis canadensis, Ginkgo biloba, Gleditsia triacanthos, Gymnocladus dioica, Tilia cordifolia,* and *Ulmus*. Hardly common, persistent hunting in corporate-scale landscapes with young trees will often prove satisfying. Although we have it rarely from *Gleditsia triacanthos*, it is rare on this ubiquitously planted tree. ~ With us this species is varies from adnate-foliose to suffruticose, the older portions of the thallus often blanching to gray.

Allegan-MOR, Boone-MOR, Cass-MOR, Cook-CASC,MOR, DeKalb-MOR, DuPage-MOR, Elkhart-MOR, Fulton-MOR, Grundy-MOR, Kane-MOR, Kankakee-MOR, Kendall-MOR, Kenosha-MOR, Koskiusko-MOR, LaGrange-MOR, Lake Il-MOR, Lake In-MOR, LaPorte-MOR, LaSalle-MOR, Lee-MOR, McHenry-MOR, Milwaukee-MOR, Noble-MOR, Ogle-MOR, Ottawa-MOR, Porter-MOR, Racine-MOR, Rock-MOR Steuben-MOR, St. Joseph In-MOR, Walworth-MOR, Waukesha-MOR, Will-MOR, Winnebago-MOR

ZWACKHIA Körber LECANOGRAPHACEAE [Photobiont: *Trentepohlia.* In honor of the German lichenologist Philipp Franz Wilhelm von Zwach-Holzhausen (1826-1903). Thallus crustose; apothecia black, the hymenium I+ blue to orange, the epithecium pale; small; spores mostly 8, hyaline, 11–15 septate, acicular.]

Zwackhia viridis (Ach.) Poetsch & Schied. (L. *viridis*, green; from the greenish thallus of some specimens) = *Opegrapha viridis* Ach. The only Southern Lake Michigan Region records for this species were collected on *Ulmus americana* and a stump of *Acer negundo*. ~ Apothecia prevailingly less than 1 mm across; spores 25 μm –60 μm × 6 μm –9 μm.

DuPage-MOR, LaSalle-MOR

INDEX OF SYNONYMS AND MISAPPLIED NAMES

The following is a listing of names that have been used or applied locally for Southern Lake Michigan region lichens. These names are not necessarily taxonomic synonyms or even routinely misapplied names; they may represent misidentifications or legitimate older names that are known now to have narrower distributions. In some cases, they are related species that appear in text where taxonomic issues are discussed. All of these names are indexed to the species under which they are listed or discussed.

Cladonia didyma subulata — Cladonia didyma
Cladonia fimbriata coniocraea — Cladonia ochrochlora
Cladonia fimbriata simplex — Cladonia chlorophaea, C. conista, C. cylindrica
Cladonia gracilis — Cladonia gracilis turbinata
Cladonia gracilis verticillata — Cladonia gracilis, C. verticillata
Cladonia grayi aberrans — Cladonia grayi
Cladonia humilis — Cladonia conista
Cladonia macilenta — Cladonia macilenta bacillaris
Cladonia mitrulla squamulosa — Cladonia peziziformis
Cladonia pityrea — Cladonia ramulosa
Cladonia pityrea zwackhii squamulifera — Cladonia ramulosa
Cladonia pityrea zwackhii subacuta — Cladonia ramulosa
Cladonia polycarpoides — Cladonia subcariosa
Cladonia pulchella — Cladonia didyma
Cladonia pyxidata pocillum — Cladonia chlorophaea
Cladonia rangiferina — Cladina rangiferina
Cladonia rangiferina sylvatica — Cladina subtenuis
Cladonia subapodocarpa — Cladonia petrophila
Cladonia subtenuis — Cladina subtenuis
Cladonia subulata — Cladonia coniocraea
Cladonia sylvatica — Cladina mitis
Clauzadea immersa — Protoblastenia rupestris
Claviscidium lacinulatum — Placidium lacinulatum
Claviscidium umbrinum — Placidium umbrinum
Collema bachmanianum — Enchylium bachmanianum
Collema conglomeratum — Enchylium conglomeratum
Collema granosum — Lathagrium auriforme
Collema limosum — Enchylium limosum
Collema microphyllum — Scytinium fragrans
Collema polycarpon — Enchylium polycarpon
Coniocybe pallida — Sclerophora nivea
Dendriscocaulon umhausense — Dendriscocaulon intricatulum
Dermatocarpon lachneum — Placidium lachneum
Dermatocarpon miniatum — Dermatocarpon muhlenbergii
Dermatocarpon pusillum — Endocarpon petrolepideum
Dimerella pineti — Coenogonium pineti
Ditremis biformis — Anisomeridium biforme
Ditremis nyssagenum — Anisomeridium polypori
Endocarpon arboreum — Placidium arboreum
Endocarpon diffractellum — Willeya diffractella
Endocarpon hepaticum — Placidium lachneum
Endocarpon miniatum — Dermatocarpon muhlenbergii
Endocarpon miniatum complicatum — Dermatocarpon muhlenbergii
Endocarpon miniatum muhlenbergii — Dermatocarpon muhlenbergii
Endocarpon pusillum — Endocarpon petrolepideum
Endocarpon pusillum garovaglii — Endocarpon petrolepideum
Endocarpon rufescens — Placidium lachneum
Gasparinia microphyllina — Caloplaca microphyllina
Gonohymenia cribellifera — Lichinella cribellifera
Gonohymenia nigritella — Lichenella nigritella
Graphina abaphoides — Graphis scripta
Graphis comma — Graphis lineola
Graphis dendritica — Graphis scripta
Graphis elegans — Graphis scripta
Heppia adglutinata— Heppia conchiloba
Heppia despreauxii — Heppia conchiloba
Heppia lutosa — Heppia conchiloba
Hypocenomyce anthracophila – Hypocenomyce scalaris
Julella sericea — Julella fallaciosa
Lecania perproxima — Caloplaca atroalba
Lecanora albella — Lecanora albellula
Lecanora aipospila — Caloplaca atroalba
Lecanora calcarea — Circinaria calcarea
Lecanora calcarea contorta — Circinaria contorta
Lecanora cervina — Sarcogyne hypophaea, Sarcogyne regularis
Lecanora cinereofusca appalachensis — Lecanora saxigena
Lecanora dispersa — Myriolecis dispersa
Lecanora erysibe — Lecania perproxima
Lecanora expallens — Lecanora thysanophora
Lecanora glabrata — Lecanora hybocarpa
Lecanora hagenii — Myriolecis hagenii
Lecanora hagenii sambuci — Myriolecis sambuci
Lecanora layana — Lecanora nothocaesiella
Lecanora muralis — Protoparmeliopsis muralis
Lecanora pallida — Lecanora caesiorubella
Lecanora perproxima — Lecania perproxima
Lecanora piniperda — Lecanora albellula
Lecanora privigna — Sarcogyne hypophaea
Lecanora privigna pruinosa — Sarcogyne regularis
Lecanora pseudo-chlarotera — Lecanora hybocarpa
Lecanora sambuci — Myriolecis sambuci
Lecanora subfusca — Lecanora hybocarpa
Lecanora subfusca allophana — Lecanora hybocarpa
Lecanora valesiaca — Protoparmeliopsis muralis
Lecanora varia — Lecanora laxa
Lecanora varia saepinicola — Lecanora symmicta
Lecanora varia symmicta — Lecanora symmicta
Lecidea aeruginosa — Trapeliopsis flexuosa
Lecidea cyrtidia — Leimonis erratica
Lecidea enteroleuca — Lecidella euphorea, Trapeliopsis granulosa
Lecidea erratica – Leimonis erratica
Lecidea flavidolivens — Fellhanera minnisinkorum
Lecidea flexuosa — Trapeliopsis flexuosa
Lecidea granulosa — Trapeliopsis granulosa
Lecidea macrocarpa — Porpidia crustulata
Lecidea sp. #4 — Lecania croatica
Lecidea uliginosa — Placynthiella icmalea
Lecidea varians — Pyrrhospora varians
Lecidella elaeochroma — Lecidella euphorea
Lepraria cryophila — Lepraria hodkinsoniana
Lepraria incana — Lepraria hodkinsoniana
Lepraria lesdainii — Botryolepraria lesdainii
Lepraria lobificans — Lepraria normandinoides
Leptogium bolacinum — Dendriscocaulon intricatulum
Leptogium chloromelum — Leptogium milligranum
Leptogium dactylinum — Scytinium dactylinum
Leptogium hirsutum — Leptogium hirsutum
Leptogium juniperinum — Scytinium juniperinum
Leptogium lacerum — Scytinium lichenoides
Leptogium lichenoides — Scytinium lichenoides
Leptogium myochroum — Scytinium dactylinum
Leptogium pulchellum — Leptogium corticola
Leptogium saturninum — Leptogium hirsutum
Lichenothelia metzleri — Lichenothelia scopularia
Lithothelium phaeospora — Lithothelium septemseptatum
Melanelia septentrionalis — Melanohalea septentrionalis
Melanelia subaurifera — Melanelixia subaurifera
Micarea micrococca — Micarea byssacea
Micarea misella –- Micarea byssacea
Micarea prasina — Micarea byssacea
Microthelia micula — Kirschsteiniothelia aethiops
Muellerella lichenicola — Gyalolechia flavovirescens
Mycobilimbia sabuletorum – Bilimbia sabuletorum
Mycocalicium albonigrum — Mycocalicium subtle
Mycomicrothelia — Kirschsteiniothelia aethiops
Mycobilimbia berengeriana — Mycobilimiba tetramera
Mycobilimbia hypnorum — Bryobilimbia hypnorum
Mycoglaena quercicola — Mycoglaena meridionalis
Mycoporum pycnocarpum — Mycoporum compositum
Omphalaria pulvinata — Thyrea pulvinata
Opegrapha atra — Arthonia atra

Opegrapha pulicaris — Alyxoria varia
Opegrapha varia — Alyxoria varia
Opegrapha viridis — Zwackhia viridis
Pannaria lanuginosa — Lepraria finkii
Pannaria nigra — Cryptothele permiscens, Placynthium nigrum, Rhizocarpon reductum
Parmelia andreana — Flavopunctelia flaventior
Parmelia aurulenta — Myelochroa aurulenta
Parmelia bolliana — Punctelia bolliana
Parmelia borreri — Punctelia bolliana, P. caseana
Parmelia borreri rudecta — Punctelia rudecta
Parmelia caperata — Flavoparmelia caperata
Parmelia cetrata — Parmotrema cetratum
Parmelia colpodes — Anzia colpodes
Parmelia crinita — Parmotrema crinitum
Parmelia flaventior — Flavopunctelia flaventior
Parmelia frondifera -- Punctelia bolliana
Parmelia galbina — Myelochroa galbina
Parmelia olivacea — Melanelixia subaurifera
Parmelia perforata — Parmotrema perforatum
Parmelia perlata — Parmotrema reticulatum
Parmelia physodes — Hypogymnia physodes
Parmelia rudecta — Punctelia rudecta
Parmelia saxatilis sulcata — Parmelia sulcata
Parmelia septentrionalis — Melanohalea septentrionalis
Parmelia soredica — Flavopunctelia soredica
Parmelia subaurifera — Melanelixia subaurifera
Parmelia subrudecta — Punctelia caseana
Parmelia tiliacea — Hypotrachyna livida, Myelochroa galbina
Parmelia tiliacea sulphurosa — Myelochroa galbina
Parmelia ulophyllodes — Flavopunctelia soredica
Parmelina obsessa — Myelochroa obsessa
Parmeliopsis aleurites — Imshaugia aleurites
Parmotrema chinense — Parmotrema perlatum
Peltigera aphthosa — Peltigera leucophlebia
Peltigera canina — Peltigera polydactylon
Peltigera canina rufescens — Peltigera rufescens
Peltigera canina rufescens innovans — Peltigera praetextata
Peltigera spuria — Peltigera didactyla
Pertusaria amara — Lepra amara
Pertusaria communis — Pertusaria macounii
Pertusaria leucostoma — Pertusaria leioplaca
Pertusaria multipuncta — Lepra multipuncta
Pertusaria paratuberculifera — Pertusaria macounii
Pertusaria pertusa — Pertusaria macounii
Pertusaria trachythallina — Lepra trachythallina
Pertusaria velata — Varicellaria velata
Phaeographis dendritica — Graphis scripta
Phaeophyscia cernohorskyi — Phaeophyscia hirsuta
Phaeophyscia chloantha — Physciella chloantha
Phaeophyscia imbricata — Physciella melanchra
Physcia adglutinata — Hyperphyscia adglutinata
Physcia chloantha — Physciella chloantha
Physcia granulifera — Heterodermia granulifera, Physcia aipolia
Physcia obscura — Phaeophyscia ciliata
Physcia pulverulenta — Anaptychia palmulata
Physcia speciosa — Heterodermia speciosa
Physcia stellaris aipolia — Physcia aipolia
Physcia stellaris tuberculata — Physcia stellaris
Physcia subtilis — Physcia dakotensis
Physcia tribacia — Physcia millegrana
Physciopsis adglutinata — Hyperphyscia adglutinata
Physciopsis syncolla — Hyperphyscia syncolla
Physconia detersa — Physconia leucoleiptes
Physconia grisea — Physconia leucoleiptes
Physconia distorta — Anaptychia palmulata
Placodium aurantiacum — Caloplaca ulmorum, Gyalolechia flavorubescens
Placodium cinnabarinum — Squamulea subsoluta
Placodium ferrugineum — Blastenia ferruginea, Caloplaca cerina
Placodium microphyllinum — Caloplaca microphyllina
Placodium vitellinum — Candelariella vitellina
Placodium vitellinum aurellum — Candelariella aurella
Placopyrenium fuscella — Verrucaria fuscella
Placynthiella dasaea — Placynthiella icmalea
Plagiocarpa hyalosporra — Lithothelium hyalosporum
Plagiocarpa septemseptata — Lithothelium septemseptatum
Polyblastiopsis fallaciosa — Julella fallaciosa
Porina chlorotica — Pseudosagedia chlorotica
Porpidia macrocarpa — Porpidia crustulata
Porpidia tahawasiana — Porpidia subsimplex
Protoparmeliopsis gyrophorica — Protoparmeliopsis muralis
Pseudoparmelia baltimorensis — Flavoparmelia baltimorensis
Pseudoparmelia caperata — Flavoparmelia caperata
Pseudoparmelia crozalsiana — Crespoa crozalsiana
Pseudoparmelia texana — Canoparmelia texana
Psora scalaris — Hypocenomyce scalaris
Psorotichia frustulata — Pycnocarpon thelostomum
Punctelia flaventior — Flavopunctelia flaventior
Punctelia semansiana – Punctelia graminicola
Punctelia soredica — Flavopunctelia soredica
Punctelia subrudecta — Punctelia caseana
Pyrenula analepta — Naetrocymbe punctiformis
Pyrenula gemmata — Eophyrenula intermedia
Pyrenula glabrata — Constrictolumina cinchonae, Pyrenula pseudobufonia
Pyrenula imperfecta — Pyrenula pseudobufonia
Pyrenula laevigata — Pyrenula pseudobufonia
Pyrenula neglecta — Pyrenula pseudobufonia
Pyrenula nitida — Pyrenula pseudobufonia
Pyrenula punctiformis — Kirschsteiniothelia aethiops, Naetrocymbe punctiformis
Pyxine caesiopruinosa
Ramalina calicaris fastigiata — Ramalina sinensis
Ramalina calicaris fraxinea — Ramalina sinensis
Ramalina complanata — Ramalina sinensis
Ramalina culbersoniorum – Ramalina americana
Ramalina fastigiata subampliata — Ramalina sinensis
Ramalina subampliata — Ramalina sinensis
Ramalina unifolia — Ramalina sinensis
Rhizocarpon obscuratum — Rhizocarpon reductum
Rhizoplaca chrysoleuca — Rhizoplaca subdiscrepans
Rimelia cetrata — Parmotrema citratum
Rimelia reticulata — Parmotrema reticulatum
Rinodina sophodes — Rinodina cana
Saccomorpha icmalea — Placynthiella icmalea
Saccomorpha oligotropha — Placynthiella oligotropha
Sagedia oxyspora — Leptorhaphis epidermidis
Santessoniolichen punctiforme — Naetrocymbe punctiformis
Sarcinulella banksiae — Anisomeridium polypori
Staurothele diffrractella — Willeya diffractella
Sticta quercizans — Lobaria quercizans
Stictis urceolatum -- Conotrema urceolatum
Strigula stigmatella — Strigula submuriformis
Thelidium microcarpon — Thelidium zwackhii
Thelidiella blastenicola — Xanthocarpia feracissima
Theloschistes chrysophthalmus – Teloschistes chrysophthalmus
Theloschistes concolor — Candelaria concolor
Theloschistes lychneus — Xanthomendoza hasseana
Theloschistes parietinus — Xanthoria parietina
Trapelia involuta — Trapelia glebulosa
Trichothelium chloroticum — Pseudosagedia chlorotica

Urceolaria scruposa — Diploschistes muscorum
Usnea barbata — Usnea strigosa
Usnea barbata florida — Usnea strigosa
Variolaria amara — Lepra amara
Verrucaria aethiobola — Bacidia egenula, Verrucaria elaeomelaena
Verrucaria baldensis — Bagliettoa baldensis
Verrucaria calciseda — Bagliettoa calciseda
Verrucaria inundata — Verrucaria calkinsiana
Verrucaria iowensis — Verrucaria fayettensis
Verrucaria margacea — Verrucaria aethiobola
Verrucaria marmorea — Bagliettoa marmorea
Verrucaria prospersella — Pyrenocollema prospersella
Verrucaria pyrenophora — Thelidium zwackhii, Verrucaria calkinsiana
Verrucaria rupestris — Verrucaria calkinsiana
Verrucaria tectorum — Verrucaria macrostoma
Viridothelium virens — Trypethelium virens
Xanthocarpia lactea — Xanthocarpia feracissima
Xanthoparmelia angustiphylla — Xanthoparmelia hypofusca
Xanthoparmelia somloënsis — Xanthoparmelia viriduloumbrina
Xanthoparmelia stenophylla — Xanthoparmelia viriduloumbrina
Xanthoparmelia tasmanica — Xanthoparmelia hypofusca
Xanthoparmelia trinctina — Xanthoparmelia australasica
Xanthoria elegans — Rusavskia elegans
Xanthoria fallax — Xanthomendoza fallax
Xanthoria polycarpa — Xanthomendoza hasseana
Xanthoria sorediata — Rusavskia sorediata
Xanthoria ulophyllodes — Xanthomendoza ulophyllodes

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