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The Lichen Flora of Logan County, Illinois

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ABSTRACT

Sixty species of lichens are reported from Logan County, Illinois. Thirty-four lichens are of the crustose growth form, 24 are foliose and 2 are fruticose. Forty-one lichens are considered to be rare, 14 are occasional, 3 are frequent and 2 are common. The most commonly occupied corticolous substrate in Logan County is *Quercus rubra*, weathered concrete is the most common saxicolous substrate and weathered wood is the most common lignicolous substrate. Lichens were also found growing on other substrates such as fungi, cloth, steel, painted aluminum fencing and a fiberglass boat frame. A key to the lichen flora of Logan County is provided as well as information on their habitats, abundance and distribution.

INTRODUCTION

This project was undertaken to document and collect voucher specimens of the lichen flora of Logan County, Illinois, develop an identification key to the lichen flora there and provide information on their habitats, abundance and distribution. No previous work has been devoted to the lichen flora of Logan County, Illinois.

Logan County is located in central Illinois, 56 kilometers north of the State capitol of Springfield (Figure 1). It has a land area of approximately 1,600 square kilometers (Gaquin & DeBrandt, 2006). According to the U.S. Bureau of the Census (1995) the population is approximately 31,000.

Prior to European settlement, Logan County was 85% prairie, 14% forested and 1% water and swamp (Illinois Natural History Survey, 2007). Along with herbaceous prairie vegetation, upland trees included *Carya ovata*, *Quercus alba*, *Q. macrocarpa* and *Q. velutina*. Trees growing along waterways included *Acer saccharinum*, *Fraxinus* sp. and *Ulmus americana*. According to the USDA (2007), today nearly 90% of the County is devoted to agricultural crops, thus limiting the lichen flora to natural areas along waterways (Sugar, Salt and Kickapoo Creeks), in cemeteries, parks and Illinois Nature Preserves at Elkhart (Elkhart Grove) and Atlanta (Bellrose).

According to Schwegman (1973), the natural divisions described for central Illinois that occur in Logan County mainly include the Grand Prairie Natural Division, with much of it represented by the *Springfield Section*. The *Grand Prairie Section* of the Grand Prairie Natural Division is represented in the northeastern part of the County. A small portion in the northwestern part of the County is in the *Illinois River Section* of the Upper Missis-

sippi River and Illinois River Bottomlands Division.

The terrain is generally rolling to hilly, but level to undulating in upland areas. Elevations range from a low of 155 meters above sea level along the western border in the Salt Creek and Sugar Creek waterways, to a high of 235 meters at Elkhart Hill in Elkhart. (Illinois State Geological Survey, 2006). Centrally located, the city of Lincoln is approximately 181 meters above sea level.

The climate is considered continental with fairly cold winters and warm summers (Bair, 1992). The average temperatures in January range from a high of .5° C to a low of –8.8° C. The average July temperatures range from a high of 30.5° C to a low of 18.3° C. The average annual precipitation is 91 cm with 61 cm occurring as snow.

MATERIALS AND METHODS

This project began in 1993 with a few collections of lichens being made by the author near the cities of Atlanta, Broadwell, Elkhart and Lincoln. After a 13-year hiatus from visiting Logan County, the author revisited those cities in 2006 and sampled the remainder of the County. During 2006, three trips were made in this respect.

Seventeen locations were sampled throughout Logan County for this study (Table 1). An attempt was made to collect and identify lichens from as many types of habitats as possible. Surveys were conducted by walking each of the sample locations for 2 hours with all lichens found identified in that period. This technique was repeated at all seventeen locations. The majority of sample locations were visited only once, as they were small in size and had fewer substrates to examine, while larger locations were sampled multiple times.

The abundance and distribution of the lichen flora was determined by counting the number of locations each lichen species was found at and assigning that species an abundance category. Assignment of abundance categories was based on the following criteria: rare (found at 1-4 locations), occasional (5-9 locations), frequent (10-14 locations) and common (15-17 locations). These abundance categories refer to values relative to Logan County and not the rest of Illinois.

To assist in lichen identification, tests for chemical substances produced by lichens were made on specimens with two chemical reagents: calcium hypochlorite [$Ca(ClO)^2$, abbreviated as C] and potassium hydroxide [KOH, abbreviated as K] and follow Hale (1973). Some species of lichens contain acids, which react to these reagents, resulting in color changes of their upper cortex (upper fungal layer) or medulla (middle fungal layer). The presence or absence of reactions between these acids and these reagents were used to identify some lichen species.

The growth form of each lichen was determined: *foliose* (leaf-like), *crustose* (crust-like) or *fruticose* (shrub-like) as well as the substrate: *saxicolous* (growing on concrete, dolomite or granite), *corticolous* (growing on the bark of trees or shrubs), *lignicolous* (growing on wood or decorticate logs) or other (growing on steel, paint, fiberglass, fungi, etc.). Nomenclature and species concepts for vascular plants identified as substrates follow Dirr (1998) or Swink and Wilhelm (1994).

All lichen collections have been deposited in the herbarium at the Morton Arboretum (MOR), Lisle, Illinois.

RESULTS AND DISCUSSION

Sixty species of lichens in 35 genera are reported from Logan County, Illinois. Thirty-four lichens (57%) are of the crustose growth form, 24 (40%) are foliose and 2 (3%) are fruticose. Based on the abundance and distribution criteria, 41 species (68%) are considered to be rare in Logan County, 14 (24%) are occasional, 3 (5%) are frequent and 2 (3%) are common. Two lichens, *Candelaria concolor* and *Physcia millegrana* were the most common lichens in Logan County and were found on all three types of substrates. These two lichens are pollution tolerant and usually thrive in disturbed situations. No lichens found here are threatened or endangered in Illinois.

Of the 41 lichens that are rare, 26 were found at single locations and are indicated in the annotated species list as such. Half of these 26 species, though routinely found in central Illinois, were rare in Logan County because substrate material was limited:

- On wood fencing: *Caloplaca holocarpa, Cladonia cristatella, C. macilenta* var. *bacillaris, Cyphellium tigillare, Lecanora umbrina, Trapeliopsis flexuosa*
- On fungi: *Phaeocalicium polyporaeum*
- On weathered concrete: *Thelidium zwackhii, Candelariella aurella, Caloplaca cf. feracissima*
- On gravel: *Verrucaria muralis*
- On bark: *Lecanora symmicta*
- On *Juglans nigra*: *Caloplaca ulmorum*

The remaining 13 lichens are typically rare or uncommon in central Illinois:

- On granite headstones: *Xanthoparmelia conspersa*
- On granite boulders: *Rinodina oxidata*
- On concrete: *Caloplaca citrina* and *Caloplaca* species (Hyerczyk #2117)
- On *Liquidambar styraciflua: Biatora* species (Hyerczyk #2066).
- On *Acer saccharinum: Amandinea dakotensis*
- On *Celtis occidentalis*: *Arthonia* species (Hyerczyk #2067) and *Opegrapha varia*
- On *Crataegus mollis*: *Myelochroa aurulenta*
- On *Juglans nigra*: *Lecanora hagenii*
- On *Populus deltoides*: *Physcia americana*
- On *Quercus rubra* trunk: *Flavopunctelia soredica*
- On *Quercus rubra* fencing: *Amandinea dakotensis* and *Buellia stillingiana*

Lichens were found on 45 different species trees and shrubs in Logan County (Appendix I). The five most common corticolous substrates were *Quercus rubra* with 20 lichen species, followed by *Juglans nigra* (15 species), *Quercus alba* and *Celtis occidentalis* (14 species) and *Acer saccharinum* (13 species). Twelve or fewer lichens were found on the remaining trees and shrubs.

Some lichens growing on the bark of young, smooth, twigs and stems included *Amandi-*

nea dakotensis, Arthonia species (Hyerczyk #2067), *Graphis scripta* and *Lecanora strobilina*. Lichens found on the trunks and canopy branches of older, larger trees included *Anisomeridium polypori, Flavoparmelia caperata, Julella fallaciosa, Lepraria lobificans, Parmotrema hypotropum, P. reticulatum, Physcia aipolia, Punctelia* spp., and *Xanthomendoza* spp. The lichen flora was generally found growing at the base of trees or on canopy branches. Here soil evaporation or transpiration may contribute to their growth.

Weathered wood was the most common lignicolous substrate in Logan County with 22 lichen species. Lichens growing on weathered wood fencing, and other lignicolous substrates, included *Amandinea punctata, Caloplaca holocarpa, C. microphyllina, Cladonia cristatella, Cyphelium tigillare* and *Trapeliopsis flexuosa*.

Weathered concrete was the most common saxicolous substrate with 14 lichen species. Lichens growing on concrete, and other saxicolous substrates, included *Bacidina egenula, Caloplaca citrina, C. subsoluta, Candelariella aurella, Endocarpon pallidulum, Lecanora dispersa, Phaeophyscia hirsuta, Physconia leucoleiptes, Rinodina oxydata* and *Verrucaria muralis*.

Six or fewer species of lichens were found on each of the remaining substrates, which included fungi, cloth, steel, painted aluminum fencing and a fiberglass boat frame.

The lichen flora of Logan County appears to be similar in composition and diversity to other areas in central Illinois such as the Lincoln Memorial Garden (LMG) in Springfield (Sangamon County, Illinois) and counties north of Logan County. The LMG grounds are a mixture of woodlands and prairie plantings. Hyerczyk (2004, unpublished) reported 23 species of lichens at LMG, 19 of which are also known from Logan County.

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LITERATURE CITED

Aptroot, A. 2003. A new perspective on the sorediate Punctelia (*Parmeliaceae*) species of North America. Bryologist 106: 317-319.

Bair, Frank E. 1992. The Weather Almanac, 6th edition. Gale Research, Inc. Detroit Michigan.

Brodo, I.M., S. D. Sharnoff, and S. Sharnoff. 2001. Lichens of North America. Yale University Press, New Haven and London. xxiv + 795 pp.

Dirr, Michael A. 1998. Manual of woody landscape plants: their identification, ornamental character, culture, propagation and uses. 5th ed. Stipes Publishing, Champaign, IL.

Esslinger. T.L. 1978. Studies in the lichen family Physciaceae. II. The lichen genus *Phaeophyscia* in North America. Mycotaxon 7: 283-320.

Esslinger, T. L. 2007. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm (First Posted 1 December 1997, Most Recent Update 2 April 2007), Fargo, North Dakota.

Gaquin, D.A. and K.A. DeBrandt. 2006. 2006 County and city extra, annual metro, city and county data book, 14th ed. Bernan Press, Lanham, MD.

Hale, M. E., Jr. 1973. The biology of lichens. Ed. Arnold (Publishers), 300 North Charles Street, Baltimore, MD 21201

Hale, M. E., Jr. 1974. New combinations in the lichen genus Parmotrema Massalongo. Phytogia 28: 334-339.

Hale, M.E., Jr. 1979. How to know the lichens. 2nd ed. W. C. Brown, Dubuque, Iowa.

Harris, R.C. and W.R.Buck. 1978. Lichens of the Mackinac Straite region II. Candelariella Müll. Arg. Michigan Bot. 17: 155-161.

Hyerczyk, R.D. 2004. The lichen flora of the Lincoln Memorial Garden, Sangamon County, Illinois. Unpublished.

Illinois Natural History Survey. 2007. Champaign, Illinois. http://www.inhs.uiuc.edu./cwe/maps/logan.pdf Last updated: Friday, 02-Feb-2007.

Illinois State Geological Survey. 2007. Champaign, Illinois. http://www.isgs.uiuc.edu/hi_low/logan.html Last updated: 1/29/2007.

Krog, H. 1982. *Punctelia*, a new lichen genus in the Parmeliaceae. Nordic Journal of Botany 2: 287-292.

Lindblom, L. 2006. *Xanthomendoza galericulata*, a new sorediate lichen species, with notes on similar species in North America. The Bryologist. 109(1), pp. 1-8.

Schwegman, J.E. 1973. Comprehensive plan for the Illinois Nature Preserves System. Part 2. The natural divisions of Illinois. Illinois Nature Preserves Commission, Rockford, Illinois.

Sheard, J.W. and P.F. May. 1997. A synopsis of the species of *Amandinea* (lichenized Ascomycetes, Physciaceae) as presently known in North America. Bryologist 100: 159-169.

Swink, F., and G. Wilhelm. 1994. Plants of the Chicago region. 4th ed. Indiana Academy of Science, Indianapolis.

Thomson, J.W. 1963, The lichen genus *Physcia* in North America. Beth. Nova Hedwigia 7:172 pp.

Thomson, J.W. 2003. Lichens of Wisconsin. University of Wisconsin Board of Regents, Madison.

United States Bureau of the Census (Population Division). Washington, DC. 1995. ILLINOIS Population of Counties by Decennial Census: 1900 to 1990. Compiled and edited by Richard L. Forstall.

United States Department of Agriculture. 2006. http://www.ams.usda.gov/statesummaries/IL/county/county_pdf/logan.pdf Last updated: 1/11/2006.

Wilhelm, G. and D. Ladd. 1992. A new species of the lichen genus *Punctelia* from the midwestern United States. Mycotaxon 44: 495-504.

Wilhelm, Gerould S. 1998. The lichen flora of Chicago and Vicinity: One hundred years of lichenology. Erigenia 16:3-36.

Willey, H. 1890. A synopsis of the genus *Arthonia*. New Bedford, MA: 62pp.

KEY TO GROUPS & GENERA AND ANNOTATED SPECIES LIST

This section includes a key to the groups and genera of the lichens of Logan County, Illinois. Following this section, arranged alphabetically by genus and species, is an annotated species list with abundance and distribution information, and a brief description of habitat. A key is provided for each genus that is represented in Logan County by more than one species. All collections were made by the author and are identified with an accession number following the substrate upon which the collection was made (e.g. (*Rhus glabra* (#1234)). Nomenclature and authorities follow Esslinger (2007). At least one representative specimen has been chosen to voucher each reported species.

1. Fruiting body terminating a slender black stalk ..... PHAEOCALICIUM
1. Fruiting body sessile to immersed, not terminating a slender black stalk, or fruiting body absent ..... 2.
2(1). Thallus scale-like, of ascending squamules; fruiting bodies, if present, red, on simple to slightly branched podetia; podetia resembling pointed or blunt clubs ..... CLADONIA
2. Thallus not as above ..... 3.
3(2). Thallus leaf-like, usually attached to substrate by rhizines; with both an upper and lower cortex present ..... I - FOLIOSE LICHENS
3. Thallus crust like, tightly attached to substrate, lacking rhizines and a lower cortex ..... 4.
4(3). Fruiting bodies absent ..... II - STERILE CRUSTOSE LICHENS
4. Fruiting bodies present ..... 5.
5(4). Fruiting body flask-like, embedded in the upper cortex with only the apex visible, opening by an apical pore; a perithecium ..... III - CRUSTOSE LICHENS WITH PERITHECIA
5. Fruiting body substellate, elongated, round or disk-like, sessile with upper cortex; an apothecium ..... IV - CRUSTOSE LICHENS WITH APOTHECIA

I - FOLIOSE LICHENS

1. Thallus some shade of orange, yellow or yellowish green ..... 2.
1. Thallus some shade of brown, gray or green ..... 6.
2(1). Thallus K+ violet ..... XANTHOMENDOZA.
2. Thallus K- ..... 3.
3(2). Thallus yellow (or yellow green when wet), lobes 0.1-0.3 mm wide; lower surface white ..... CANDELARIA
3. Thallus yellow green, lobes 1.5-8 mm wide; lower surface brown to black ..... 4.
4(3). Thallus esorediate; lobes 1.5-4 mm wide ..... XANTHOPARMELIA
4. Thallus sorediate ..... 5.
5(4). Upper cortex with white pores; medulla C+ red; lobes 4-8 mm wide .. FLAVOPUNCTELIA
5. Upper cortex without pores; medulla C-; lobes 2-8 mm wide ..... FLAVOPARMELIA
6(1). Thallus brownish gray, greenish gray or dark gray; K- ..... 7.
6. Thallus whitish gray to bluish gray; K+ yellow or rarely K- ..... 9.
7(6). Thallus lobes white pruinose ..... PHYSCONIA
7. Thallus lobes epruinose ..... 8.
8(7). Rhizines absent, thallus tightly attached to substrate ..... HYPERPHYSCIA
8. Rhizines present, thallus loosely attached to substrate ..... PHAEOPHYSCIA
9(6). Lower surface mostly brown to black (may have a wide white or tan zone along the margin) ..... 10.
9. Lower surface white to pale tan ..... 12.
10(9). Medulla pale yellow to cream colored ..... MYELOCHROA
10. Medulla white ..... 11.
11(10). Upper cortex with white angular markings; margins of lobes eciliate; lobes 2-5 mm wide with squared ends; rhizines to margin ..... PARMELIA

11. Upper cortex without markings; margins of lobes ciliate; lobes 6-20 mm wide with rounded ends; wide marginal zone without rhizines ..... PARMOTREMA
12(9). Thallus K- ..... PHYSCIELLA
12. Thallus K+ yellow ..... 13.
13(12). Upper cortex with white pores; medulla C- or C+ red ..... PUNCTELIA
13. Upper cortex without pores; medulla C- ..... PHYSCIA

II - STERILE CRUSTOSE LICHENS

1. Thallus lemon yellow ..... CANDELARIELLA
1. Thallus gray or green ..... 2.
2(1) Thallus leprose, entirely sorediate ..... LEPRARIA
2. Thallus areolate, the areoles producing soralia ..... 3.
3(2). Thallus C+ pink ..... TRAPELIOPSIS
3. Thallus C- ..... BIATORA

III - CRUSTOSE LICHENS WITH PERITHECIA

1. Thallus corticolous ..... 2.
1. Thallus saxicolous ..... 3.
2(1). Thallus white; alga absent; spores muriform; conidia bacilliform ..... JULELLA
2. Thallus gray; alga present; spores 1-3 septate, with one larger cell; conidia elliptical ..... ANISOMERIDIUM
3(1). Spores simple ..... VERRUCARIA
3. Spores muriform or septate ..... 4.
4(3). Thallus brown (or green when wet), squamulose; spores muriform ..... ENDOCARPON
4. Thallus green, thin, granulose; spores 3 septate ..... THELIDIUM

IV - CRUSTOSE LICHENS WITH APOTHECIA

1. Apothecia substellate, round or irregular; thallus a thin crust or thallus leprose, entirely sorediate ..... 2.
1. Apothecia round or disk-like; thallus well developed to absent ..... 4.
2(1). Apothecial rim absent, spores 3-5 septate ..... ARTHONIA
2. Apothecia rim present, spores 5 to multi-septate ..... 3.
3(2). Apothecia oblong; spores 5-7 septate, cells rectangular ..... OPEGRAPHA
3. Apothecia elongated to branching; spores 5-15 septate, cells lens-shaped ..... GRAPHIS
4(1). Apothecial rim thalloid, with algal cells ..... 5.
4. Apothecial rim without algae ..... 10.
5(4). Spores non-septate ..... 6.
5. Spores polarilocular or septate ..... 7.
6(5). Apothecia yellow ..... CANDELARIELLA
6. Apothecia not yellow ..... LECANORA
7(5). Spores polarilocular ..... CALOPLACA
7. Spores septate ..... 8.
8(7). Asci disintegrating into a mass of spores at maturity ..... CYPHELIUM
8. Asci evident at maturity ..... 9.
9(8). Spore wall thin; lumen of cells cylindrical ..... AMANDINEA
9. Spore wall thick; lumen of cells angular ..... RINODINA
10(4). Apothecia and thallus K+ red ..... BUELLIA
10. Apothecia and thallus K- ..... 11.
11(10). Spores brown, ellipsoid, 1-septate ..... AMANDINEA
11. Spores hyaline, acicular, 3-7 septate ..... BACIDINA

ANNOTATED SPECIES LIST

AMANDINEA M. Choisy *ex* Scheid. & H. Mayrh.

Reference: Sheard & May (1997).

1. Thallus thin, greenish to gray; apothecia with algal cells, with a thalloid margin, the rim concolorous with the disk; spores ovoid, constricted at septum ..... *Amandinea dakotensis*
1. Thallus gray; apothecia without algal cells, lacking a thalloid margin, the rim and disk black; spores elliptical, not constricted at septum ..... *Amandinea punctata*

Amandinea dakotensis (H. Magn.) P. May & Sheard
Rare on young smooth twigs and branches of *Acer saccharinum* (#2037, #2050) and *Quercus rubra* (#2094). Known only from a single location.

Amandinea punctata (Hoffm.) Coppins & Scheid.
Rare on weathered wood fencing (#2255) and on young twigs and branches of various trees.

ANISOMERIDIUM (Müll. Arg.) M. Choisy

Anisomeridium polypori (Ellis & Everh.) M. E. Barr
Rare in shaded woodlands on the lower trunks of *Quercus alba* (#2048) and other trees. This species is often present on White Oak where it gives the trunk its' grayish color. It can be confused with *Julella*, which lacks a photobiont while *Anisomeridium* has *Trentepohlia*.

ARTHONIA Ach.

Reference: Brodo, I.M., S. D. Sharnoff, and S. Sharnoff (2001), Thomson (2003), Willey (1890).

1. Photobiont chlorococcoid; thallus green, granulose-leprose, entirely sorediate; apothecia ± round, blue-gray, pruinose; spores 3-(5) septate.
1. Photobiont *Trentepholia*; thallus smooth, thin, silvery gray, esorediate; apothecia substellate to irregular, black, but appearing pruinose due to growth under epidermal cells of twigs; spores 2 septate.

Arthonia caesia (Flotow) Körber
Occasional on smooth shrubs and tree branches (#2049, #2099). It was also found on an old fiberglass boat frame. The blue-gray, pruinose apothecia and green granulose-leprose thallus are good diagnostic features of this lichen.

Arthonia species (Hyerczyk #2067, *sensu* the Lichen Flora of Logan County, Illinois)
Rare on the smooth young twigs and branches of *Celtis occidentalis* (#2067).
This lichen grows under the epidermal cells of smooth, young twigs, giving the apothecia a "pruinose" look. The thin, silvery gray thallus is a good indicator of this lichen.
Thallus smooth, thin, silvery gray, esorediate; photobiont *Trentepholia*; apothecia substellate to irregular, black, but appearing pruinose due to growth under epidermal cells of twigs; spores hyaline, 1-septate, 2 celled, 20-25 μm long X 10 μm wide; 8 spores per ascus. This lichen has pyriform asci similar to the illustration of *A. radiata* (Pers.) Ach. in Brodo (2001) pg. 26 Figure 14n, but spores are 1-septate, 2-celled not 5 celled as in *A. radiata*. Asci: 40 um high x 30 wide including a 10 um neck x 10um long. Known only from a single location.

BACIDINA Vèzda

Bacidina egenula (Nyl.) Vèzda
Rare on weathered concrete (#2047, #2089) and calcareous gravel (#2101, #2116) in moist, shaded habitats.

BIATORA Fr.

Biatora species (Hyerczyk #2066).
Rare at the base of *Liquidambar styraciflua* (#2066). This species has an areolate thallus which breaks up into pustular soredia. No lichen substances were found in this collection using thin-layer chromatography. It compares well with *Lecidea* sp. #4 *sensu* Harris (1977) (Richard Harris, New York Botanical Garden, pers. comm.). Known only from a single location.

BUELLIA De Not.

Buellia stillingiana J. Steiner
Rare on the bark of *Quercus rubra* (#2041). This collection was made off oak logs used as decorative split rail fencing at the Mount Pulaski Courthouse in Lincoln. It is not known if the lichen, or the oak logs used for fencing, is native or introduced to Logan County. Only four collections from Illinois were found in the herbarium at the Morton Arboretum, three from Johnson, Hardin and Gallatin Counties in southern Illinois and one from Ogle County in northern Illinois. This lichen is included in this flora because it is possible it is native and with further sampling it will eventually be found in the County. Known only from a single location.

CALOPLACA Th. Fr.

Reference: Thomson (2003).

1. Growing on bark or wood .....2.
1. Growing on concrete, bricks or cinders .....4.
   2(1). Apothecia and thallus K-; apothecial disk a dull waxy yellow with a white pruinose rim ..... *Caloplaca ulmorum*
   2. Apothecia K+ violet, thallus K- or K+ violet .....3.
3(2). Thallus pale to light gray, K-, apothecial disk and rim yellow-orange.. *Caloplaca holocarpa*
3. Thallus orange, K+ violet, consisting of sorediate areoles; apothecia rare .... *Caloplaca microphyllina*
   4(1). Thallus granular sorediate, K+ violet; apothecia K+ violet..... *Caloplaca citrina*
   4. Thallus esorediate or absent, K- or K+ violet ; apothecia K+ violet .....5.
5(4). Thallus yellow K+ violet, lobed, continuous, but mostly around apothecia; spores 9-13 μm x 5.5-7.0 μm, isthmus 3.5-4.5 μm..... *Caloplaca subsoluta*
5. Thallus thin, gray K-, or absent .....6.
   6(5). Thallus thin, gray; spores 12-12.5 μm x 5-6 μm, isthmus 2-2.5 μm ....*Caloplaca* species (Hyerczyk #2117)
   6. Thallus absent; spores 15.0 μm x 3.5 μm, isthmus 2.5 μm ....*Caloplaca cf. feracissima*

Caloplaca citrina (Hoffm.) Th. Fr.
Rare on a weathered concrete feed trough (#2106) at Old Gillett Farm. This lichen may be confused with the foliose lichen, *Candelaria concolor* (Dickson) Stein, which has a rhizinate lower cortex and a K- upper cortex. Known only from a single location.

Caloplaca cf. feracissima H. Magn.
Rare on weathered concrete (#996). Known only from a single location.

Caloplaca holocarpa (Hoffm. *ex* Ach.) A. E. Wade
Rare on weathered wood fencing (#2053). Known only from a single location.

Caloplaca microphyllina (Tuck.) Hasse
Occasional on weathered wood fencing (#1004, #1005, #2077) and on the trunk of *Liriodendron tulipifera*. This lichen resembles rust stains on wood fencing.

Caloplaca subsoluta (Nyl.) Zahlbr.
Occasional on weathered bricks and concrete (#2090, #2095).

Caloplaca ulmorum (Fink) Fink
Rare at the base of *Juglans nigra* (#1023) at a cemetery. The dull waxy yellow apothecial disk with a white pruinose rim are good field indicators. Known only from a single location.

Caloplaca species (Hyerczyk #2117, *sensu* the Lichen Flora of Logan County, Illinois)
Rare on weathered concrete. This lichen has a thin, gray thallus with a K- reaction. The apothecia are yellow and are K+ violet. The disk is a dark yellow and the rim is lighter yellow. The ascospores measure 12.0-12.5 μm long X 5-6 μm wide, and have an isthmus 2-2.5 μm wide. Hypothallus not present. Known only from a single location.

CANDELARIA A. Massal.

Candelaria concolor (Dickson) Stein
Common on a variety of substrates including a fiberglass boat frame, cloth, painted aluminum fencing (#2080), weathered concrete, granite and wood, and on the limbs and trunks of several species of trees including *Acer saccharum* (#980), *Juglans nigra* (#1031), *Quercus alba* (#1008) and *Ulmus rubra* (#994). Totally sorediate forms of this lichen, referred to as *Candelaria concolor* var. *effusa* (Tuck.) Burnham may intergrade with this species. This lichen may also be mistaken for the crustose lichen, *Caloplaca citrina* (Hoffm.) Th. Fr., which lacks a lower cortex and is K+ violet.

CANDELARIELLA Müll. Arg.

References: Harris & Buck (1978), Thomson (2003).

1. Thallus sorediate, consisting of rounded areoles which break down into a leprose crust .... *Candelariella reflexa*
1. Thallus esorediate .....2.
   2(1). Thallus growing on wood or bark, consisting mainly of corticate granules; apothecia rare .....*Candelariella xanthostigma*
   2. Thallus growing on concrete, lacking or not evident (growing within substrate); apothecia common; spores simple, 12.5 x 7.5 μm long, eight per ascus ....*Candelariella aurella*

Candelariella aurella (Hoffm.) Zahlbr.
Rare on weathered concrete (#986, #2039). Known only from a single location. This lichen could be mistaken for another crustose lichen, *Caloplaca cf. feracissima* H. Magn, which has K+ violet apothecia and polarilocular spores.

Candelariella reflexa (Nyl.) Lettau
Rare on the lower trunk of *Celtis occidentalis* (#2103). *Candelariella reflexa* is a western species that has 8 spores per ascus. *C. efflorescens* R. C. Harris & W. R. Buck, is an eastern species with 32 spores per ascus. Based on thallus characters alone, the two species are virtually indistinguishable in their sterile conditions. Since fertile specimens from most of central Illinois have 8 spores per ascus all sterile collections are defaulted to *C. reflexa*.

Candelariella xanthostigma (Ach.) Lettau
Rare on weathered wood fencing and on the lower trunks of *Juglans nigra* (#1022, #1024)), *Populus deltoides* (#2111) and *Quercus alba* (#1006, #2068).

CLADONIA P. Browne

References: Brodo, I.M., S. D. Sharnoff, and S. Sharnoff (2001), Hale (1979)

1. Thallus and podetia K-, esorediate; podetia wholly corticate, slightly branched at the apex; basal squamules finely divided, more than 2mm long..... *Cladonia cristatella*
1. Thallus and podetia often weakly K+ yellow, sorediate; podetia unbranched to slightly branched at the apex; basal squamules undivided, with marginal soredia, less than 2mm long ..... *Cladonia macilenta* var. *bacillaris*

Cladonia cristatella Tuck.
Rare on weathered wood fencing (#992). This is the "British Soldier" lichen. Known only from a single location.

Cladonia macilenta var. ***bacillaris*** (Genth) Schaerer
Rare on weathered wood fencing (#2056). Known only from a single location.

CYPHELIUM Ach.

Cyphelium tigillare (Ach.) Ach.
Rare on weathered wood fencing (#993, #2076). Known only from a single location.

ENDOCARPON Hedwig

Endocarpon pallidulum (Nyl.) Nyl.
Occasional on weathered concrete (#997), dolomite (#985) and calcareous gravel (#2096). This species, which lack rhizines, is similar *to E. pusillum* Hedw., a species with rhizines on the lower surface.

FLAVOPARMELIA Hale

Flavoparmelia caperata (L.) Hale
Rare on the trunks and lower canopy branches of a variety of trees including *Quercus rubra* (#2069).

FLAVOPUNCTELIA (Krog) Hale

Flavopunctelia soredica (Nyl.) Hale
Rare on the lower trunk of *Quercus rubra* (#2093). The C+ red reaction of the medulla separates this genus from *Flavoparmelia*. Known only from a single location.

GRAPHIS Adans.

Graphis scripta (L.) Ach.
Rare on the lower trunks of smooth barked trees such as *Carya ovata* (#2114, #2114a) and *Celtis occidentalis* (#2035).

HYPERPHYSCIA Müll. Arg.

Hyperphyscia adglutinata (Flörke) H. Mayrh. & Poelt
Rare at the base of *Celtis occidentalis* (#2071). This foliose species can be mistaken for a crustose lichen as it lacks rhizines and is tightly appressed to the bark.

JULELLA Fabre

Julella fallaciosa (Arnold) R. C. Harris
Rare in shaded woodlands on the lower trunks of *Celtis occidentalis* (#2086) and *Quercus alba* (#2048a). *Jullella* lacks a photobiont and may be confused with *Anisomeridium* which has *Trentepohlia*.

LECANORA Ach.

Reference: Brodo, I.M., S. D. Sharnoff, and S. Sharnoff (2001), Thomson (2003).

1. Thallus growing on concrete (rarely on wood) ..... *Lecanora dispersa*
1. Thallus growing on wood or bark ..... 2.
   2(1). Thallus with yellowish tints ..... 3.
   2. Thallus without yellowish tints ..... 4.
3(2). Apothecia irregular, smooth, rim disappearing with age ..... *Lecanora symmicta*
3. Apothecia round, granular sorediate, rim ecorticate, persistant ..... *Lecanora strobilina*
   4(2). Apothecia heavily pruinose, rim persistant ..... *Lecanora hagenii*
   4. Apothecia epruinose or slightly frosted, rim often disappearing with age ..... *Lecanora cf. umbrina*

Lecanora dispersa (Pers.) Sommerf.
Occasional on weathered concrete (#999) and wood.

Lecanora hagenii (Ach.) Ach.
Rare at the base of *Juglans nigra* (#1025) in a cemetery. Known only from a single location.

Lecanora strobilina (Sprengel) Kieffer
Occasional on weathered wood fencing (#989, #2055, #2074) and on open grown trees including a landscape planted *Pseudotsuga menziesii* (#2070).

Lecanora symmicta (Ach.) Ach.
Rare on the bark of an unknown dead tree (#2098). Known only from a single location.

Lecanora cf. umbrina (Ach.) A. Massal.
Rare on weathered wood fencing (#981). Known only from a single location.

LEPRARIA Ach.

Lepraria lobificans Nyl.
Rare on weathered limestone and bricks, and on the trunks of *Acer saccharinum* (#2038), *Quercus alba* (#1014) and other trees in moist, shaded habitats.

MYELOCHROA (Asahina) Elix & Hale

Myelochroa aurulenta (Tuck.) Elix & Hale
Rare on the lower trunk of *Crataegus mollis* (#2107). Known only from a single location.

OPEGRAPHA Ach.

Opegrapha varia Pers.
Rare on the lower trunk of *Celtis occidentalis* (#2100) in shaded woods at Elkhart Grove Nature Preserve. Known only from a single location.

PARMELIA Ach.

Parmelia sulcata Taylor
Occasional on weathered wood and bark, a granite monument (#1029) and on the lower trunk of *Gleditsia triacanthos*.

PARMOTREMA A. Massal.

Reference: Hale (1974).

1. Upper cortex distinctly white maculate; lower surface black, with a wide white or tan rhizine-free zone along the margin; upper cortex without reticulate cracks .... *Parmotrema hypotropum*
1. Upper cortex dull, emaculate; lower surface brown or black with rhizines up to the margin; upper cortex reticulately cracked ..... *Parmotrema reticulatum*

Parmotrema hypotropum (Nyl.) Hale
Occasional on weathered wood and on the lower trunks and branches of *Fraxinus pennsylvanica* var. *subintegerrima* (#2051) and other trees.

Parmotrema reticulatum (Taylor) M. Choisy
Occasional on weathered wood and on the lower trunks and branches of *Acer saccharinum, Fraxinus pennsylvanica* var. *subintegerrima* (#2054), *Liquidambar styraciflua* and *Quercus rubra* (#2040, #2092).

PHAEOCALICIUM A. F. W. Schmidt

Phaeocalicium polyporaeum (Nyl.) Tibell
Rare on the polyporous fungi, *Trichaptum biform*e (Fr.) Ryvarden, which was growing on *Prunus serotina* and *Quercus rubra* (#2109). Known only from a single location.

PHAEOPHYSCIA Moberg

Reference: Esslinger (1978).

1. Thallus esorediate ..... *Phaeophyscia ciliata*
1. Thallus sorediate ..... 2.
   2(1). Medulla orange-red ..... *Phaeophyscia rubropulcha*
   2. Medulla white ..... 3.
3(2). Lobe tips of thallus with pale, cortical hairs; soredia marginal ..... *Phaeophyscia hirsuta*
3. Lobe tips lacking cortical hairs; soredia capitate ..... *Phaeophyscia pusilloides*

Phaeophyscia ciliata (Hoffm.) Moberg
Rare on weathered wood fencing (#2075) and *Populus deltoides* (#2110).

Phaeophyscia hirsuta (Mereschk.) Essl.
Occasional on a variety of substrates including a fiberglass boat frame, weathered wood fencing, concrete (#1015b), granite boulders, limestone headstones in cemeteries (#982), and on the lower trunks of *Juglans nigra, Liquidambar styraciflua* (#2083) and other trees. The pale, cortical hairs along the edge of the thallus are good field characteristics.

Phaeophyscia pusilloides (Zahlbr.) Essl.
Rare at the base and trunks of *Acer saccharum* (#2045) and other trees.

Phaeophyscia rubropulchra (Degel.) Essl.
Occasional at the base of *Fraxinus americana* (#1011), *Juglans nigra* (#1026, #1032), *Quercus rubra* (#2073) and other trees in moist, shaded habitats. Although the orange-red medulla of this lichen is distinctive, some parts may be white.

PHYSCIA (Schreber) Michaux

Reference: Thomson (1963).

1. Thallus esorediate ..... 2.
1. Thallus sorediate ..... 3.
   2(1). Medulla K+ yellow; upper cortex with white spots ..... *Physcia aipolia* var. *aipolia*
   2. Medulla K-; upper cortex without white spots ..... *Physcia stellaris*

3(1). Thallus lobes to 0.5 mm wide; medulla and soredia K-; soredia granular .... *Physcia millegrana*
3. Thallus lobes more than 0.7 mm wide; medulla and soredia K+ yellow; soredia fine and powdery..... *Physcia americana*

Physcia aipolia (Ehrh. *ex* Humb.) Fürnr. var. ***aipolia***
Rare on *Acer saccharum* (#1018, #1020), *Liquidambar styraciflua* (#2085) and other trees.

Physcia americana G. Merr.
Rare at the base of *Populus deltoides* (#2118). Known only from a single location.

Physcia millegrana Degel.
Common on a variety of substrates including a fiberglass boat frame, cloth, steel, painted aluminum fencing (#2078), weathered bark, wood, granite and concrete, and on the limbs and trunks of several species of trees including *Acer saccharinum* (#1013), *A. saccharum* (#978) and *Quercus alba* (#1010).

Physcia stellaris (L.) Nyl.
Frequent on a variety of substrates including a fiberglass boat frame, steel, painted aluminum fencing (#2079), fallen branches, weathered wood fencing (#990), concrete, and on the limbs and trunks of several species of trees including *Fraxinus americana* (#1012) and *Liquidambar styraciflua* (#2085).

PHYSCIELLA Essl.

Physciella chloantha (Ach.) Essl.
Frequent on a fiberglass boat frame, steel, weathered headstones, concrete, and on the limbs and trunks of several species of trees including *Celtis occidentalis* (#2072) and *Juglans nigra* (#2084)

PHYSCONIA Poet

Physconia leucoleiptes (Tuck.) Essl.
Rare on weathered concrete, limestone headstones (#1002) and on *Juglans nigra* (#1016, #1027). Easily recognized in the field by the pruinose lobes.

PUNCTELIA Krog

References: Aptroot (2003), Krog (1982), Wilhelm & Ladd (1992).

1. Thallus without isidia or soredia; medulla C- ..... *Punctelia. bolliana*
1. Thallus isidiate or sorediate; medulla C+ red .....2.
2(1). Thallus isidiate .....*Punctelia rudecta*
2. Thallus sorediate ..... *Punctelia missouriensis*

Punctelia bolliana (Müll. Arg.) Krog
Occasional at the base and lower canopy branches of *Quercus alba* (#995, #1009, #1019, #2046) and other trees.

Punctelia missouriensis G. Wilh. & Ladd
Rare on weathered wood fencing and at the base and lower canopy branches of *Acer saccharum* (#1017), *Quercus alba* (#2033) and *Q. macrocarpa*.

Punctelia rudecta (Ach.) Krog
Frequent on weathered wood fencing and at the base and lower canopy branches of *Juglans nigra* (#1028), *Quercus alba* (#1003, #1007, #2032) and other trees.

RINODINA (Ach.) Gray

Rinodina oxydata (A. Massal.) A. Massal.
Rare on a granite boulder (#2115) in shaded woods at the Bellrose Nature Preserve. Known only from a single location.

THELIDIUM A. Massal.

Thelidium zwackhii (Hepp) Massal.
Rare on weathered calcareous gravel (#2091) in shaded woods. According to Theodore Esslinger and Dick Harris (pers. comm.) this is a European species synonymous with *Thelidium microcarpum* (Leight.) A.L. Sm. Known only from a single location.

TRAPELIOPSIS Hertel & Gotth. Schneider

Trapeliopsis flexuosa (Fr.) Coppins & P. James
Rare on weathered wood fencing (#991, #2052, #2088). Known only from a single location.

VERRUCARIA Schrader

Verrucaria muralis Ach.
Rare on calcareous gravel in a shaded woodland (#2034) at The Elkhart Grove Nature Preserve. Known only from a single location.

XANTHOMENDOZA S. Kondr. & Kärnefelt

Reference: Lindblom, 2006

1. Thallus cushion-like, often forming extensive colonies; thallus thin, delicate, lobes narrow 0.2-0.6 mm wide; rhizines absent or sparse, usually not visible from above; powdery soredia formed at lobe tips .....*Xanthomendoza fulva*
1. Thallus rosette-like, ± distinct; rhizines usually abundant, visible from above or not; soredia formed in marginal crescent-shaped slits between the upper and lower cortex; lobes adnate to loosely adnate, 0.8-2.0 mm wide .....*Xanthomendoza fallax*

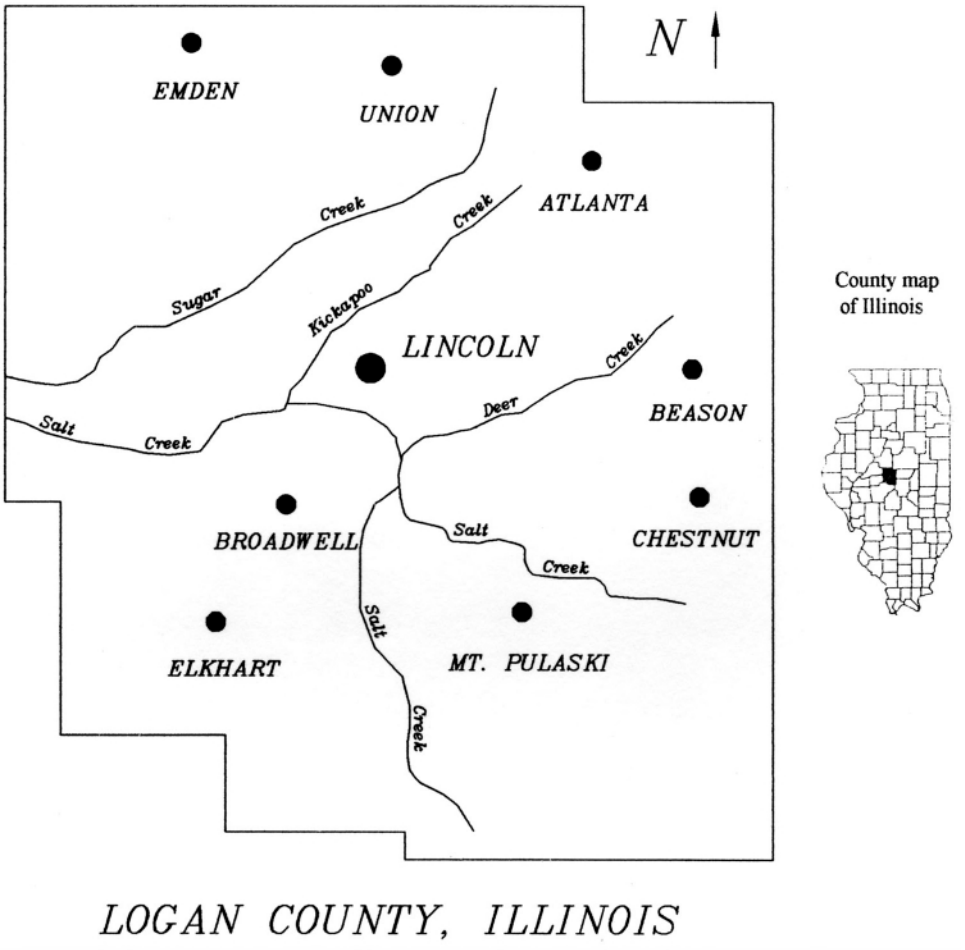
Xanthomendoza fallax (Hepp *ex* Arnold) Søchting, Kärnefelt & S. Kondr.
Occasional on painted aluminum fencing, weathered wood fencing and on the lower limbs of *Acer saccharum* (#979, #2042) and other trees.

Xanthomendoza fulva (Hoffm.) Søchting, Kärnefelt & S. Kondr.
Occasional on painted aluminum fencing (#2081), weathered headstones (#984, #1001) weathered wood fencing and on the lower limbs of *Crataegus mollis* (#2108), *Juniperus virginiana* (#983, #2082) and other trees.

XANTHOPARMELIA (Vainio) Hale

Xanthoparmelia conspersa (Ehrh. *ex* Ach.) Hale
Rare on a granite monument (#1030) in Elkhart Cemetery. Known only from a single location.

Figure 1. Map of Logan County, Illinois.



Appendix I. Substrates and the lichens associated with them.

Tree Species/Substrate	Lichen Species						
	Amandinea dakotensis	*Amandinea punctata*	*Anisomeridium polypori*	*Arthona caesia*	*Arthonia* #2067	*Bacidina egenula*	*Biatora* #2066
Acer negundo							
Acer platanoides							
Acer saccharinum		X		X			
Acer saccharum							
Betula papyrifera							
Carya ovata			X				
Catalpa speciosa							
Celtis occidentalis				X	X		
Crataegus crus-galli				X			
Crataegus mollis							
Fagus species							
Fraxinus americana							
Fraxinus quadrangulata							
Fraxinus pennsylvanica var. subintegerrima							
Gingko biloba							
Gleditsia triacanthos		X		X			
Gymnocladus dioica							
Juglans nigra				X			
Juniperus virginiana							
Larix decidua							
Liquidambar styraciflua				X			X
Liriodendron tulipifera							
Lonicera species							
Maclura pomifera				X			
Morus alba							
Picea pungens							
Pinus strobis							
Platanus occidentalis							
Populus alba							
Populus deltoides				X			
Prunus serotina				X			
Prunus species							
Pseudotsuga menziesii							
Ptelea trifoliata							
Quercus alba			X				
Quercus imbricaria							
Quercus macrocarpa			X	X			
Quercus palustris				X			
Quercus rubra	X	X		X			
Rhus glabra		X		X			
Rhus radicans							
Robinia pseudoacacia							
Rubus species							
Trichaptum biforme							
Ulmus americana			X				
Ulmus rubra							
Bark							
Brick							
Paint							
Steel							
Fiberglass boat frame				X			
Cloth							
Granite							
Wood		X					
Limestone							
Concrete						X	
Dolomite, pebbles, gravel						X	

Tree Species/Substrate	Lichen Species						
	Buellia stillingiana	*Caloplaca citrina*	*Caloplaca cf. feracissima*	*Caloplaca holocarpa*	*Caloplaca microphyllina*	*Caloplaca subsoluta*	*Caloplaca ulmorum*
Acer negundo							
Acer platanoides							
Acer saccharinum							
Acer saccharum							
Betula papyrifera							
Carya ovata							
Catalpa speciosa							
Celtis occidentalis							
Crataegus crus-galli							
Crataegus mollis							
Fagus species							
Fraxinus americana							
Fraxinus quadrangulata							
Fraxinus pennsylvanica var. subintegerrima							
Gingko biloba							
Gleditsia triacanthos							
Gymnocladus dioica							X
Juglans nigra							
Juniperus virginiana							
Larix decidua							
Liquidambar styraciflua					X		
Liriodendron tulipifera							
Lonicera species							
Maclura pomifera							
Morus alba							
Picea pungens							
Pinus strobis							
Platanus occidentalis							
Populus alba							
Populus deltoides							
Prunus serotina							
Prunus species							
Pseudotsuga menziesii							
Ptelea trifoliata							
Quercus alba							
Quercus imbricaria							
Quercus macrocarpa							
Quercus palustris	X						
Quercus rubra							
Rhus glabra							
Rhus radicans							
Robinia pseudoacacia							
Rubus species							
Trichaptum biforme							
Ulmus americana							
Ulmus rubra							
Bark						X	
Brick							
Paint							
Steel							
Fiberglass boat frame							
Cloth							
Granite				X	X		
Wood							
Limestone		X	X			X	
Concrete							
Dolomite, pebbles, gravel							

Tree Species/Substrate	Lichen Species						
	Caloplaca #2117	*Candelaria concolor*	*Candelariella aurella*	*Candelariella reflexa*	*Candelariella xanthostigma*	*Cladonia cristatella*	*Cladonia mac.* var. *bac.*
Acer negundo							
Acer platanoides		X					
Acer saccharinum		X					
Acer saccharum		X					
Betula papyrifera		X					
Carya ovata							
Catalpa speciosa		X					
Celtis occidentalis		X		X			
Crataegus crus-galli		X					
Crataegus mollis		X					
Fagus species		X					
Fraxinus americana							
Fraxinus quadrangulata		X					
Fraxinus pennsylvanica var. subintegerrima		X					
Gingko biloba		X					
Gleditsia triacanthos		X					
Gymnocladus dioica							
Juglans nigra		X			X		
Juniperus virginiana							
Larix decidua		X					
Liquidambar styraciflua		X			X		
Liriodendron tulipifera		X					
Lonicera species							
Maclura pomifera		X					
Morus alba		X					
Picea pungens		X					
Pinus strobis		X					
Platanus occidentalis		X					
Populus alba		X					
Populus deltoides		X			X		
Prunus serotina							
Prunus species		X					
Pseudotsuga menziesii		X			X		
Ptelea trifoliata		X					
Quercus alba		X			X		
Quercus imbricaria		X					
Quercus macrocarpa		X					
Quercus palustris							
Quercus rubra		X		X	X		
Rhus glabra		X					
Rhus radicans		X					
Robinia pseudoacacia							
Rubus species		X					
Trichaptum biforme							
Ulmus americana		X					
Ulmus rubra		X					
Bark							
Brick							
Paint		X					
Steel							
Fiberglass boat frame		X					
Cloth		X					
Granite		X					
Wood		X			X	X	X
Limestone							
Concrete	X	X	X				
Dolomite, pebbles, gravel							

Tree Species/Substrate	Lichen Species						
	Cyphlelium tigillare	*Endocarpon pallidulum*	*Flavoparmelia caperata*	*Flavopunctelia soredica*	*Graphis scripta*	*Hyperphyscia adglutinata*	*Julella fallaciosa*
Acer negundo							
Acer platanoides							
Acer saccharinum							
Acer saccharum					X	X	
Betula papyrifera							
Carya ovata					X		
Catalpa speciosa							
Celtis occidentalis					X	X	X
Crataegus crus-galli							
Crataegus mollis							
Fagus species							
Fraxinus americana							
Fraxinus quadrangulata							
Fraxinus pennsylvanica var. subintegerrima							
Gingko biloba							
Gleditsia triacanthos			X			X	
Gymnocladus dioica							
Juglans nigra						X	
Juniperus virginiana							
Larix decidua							
Liquidambar styraciflua			X				
Liriodendron tulipifera							
Lonicera species							
Maclura pomifera							
Morus alba							
Picea pungens							
Pinus strobis							
Platanus occidentalis							
Populus alba							
Populus deltoides			X				
Prunus serotina							
Prunus species			X				
Pseudotsuga menziesii							
Ptelea trifoliata					X		
Quercus alba			X				X
Quercus imbricaria							
Quercus macrocarpa							
Quercus palustris							
Quercus rubra			X	X	X	X	
Rhus glabra							
Rhus radicans							
Robinia pseudoacacia							
Rubus species							
Trichaptum biforme							
Ulmus americana							
Ulmus rubra							
Bark							
Brick							
Paint							
Steel							
Fiberglass boat frame							
Cloth							
Granite							
Wood	X						
Limestone							
Concrete		X					
Dolomite, pebbles, gravel		X					

Tree Species/Substrate	Lichen Species						
	Lecanora dispersa	*Lecanora hagenii*	*Lecanora strobilina*	*Lecanora symmicta*	*Lecanora cf. umbrina*	*Lepraria lobificans*	*Myelochroa aurulenta*
Acer negundo							
Acer platanoides							
Acer saccharinum			X			X	
Acer saccharum							
Betula papyrifera							
Carya ovata							
Catalpa speciosa							
Celtis occidentalis							
Crataegus crus-galli							
Crataegus mollis						X	X
Fagus species							
Fraxinus americana							
Fraxinus quadrangulata							
Fraxinus pennsylvanica var. subintegerrima							
Gingko biloba							
Gleditsia triacanthos			X				
Gymnocladus dioica							
Juglans nigra		X					
Juniperus virginiana							
Larix decidua							
Liquidambar styraciflua							
Liriodendron tulipifera							
Lonicera species							
Maclura pomifera							
Morus alba							
Picea pungens							
Pinus strobis			X				
Platanus occidentalis							
Populus alba							
Populus deltoides						X	
Prunus serotina							
Prunus species							
Pseudotsuga menziesii			X				
Ptelea trifoliata							
Quercus alba			X			X	
Quercus imbricaria							
Quercus macrocarpa							
Quercus palustris			X				
Quercus rubra			X				
Rhus glabra			X				
Rhus radicans							
Robinia pseudoacacia							
Rubus species							
Trichaptum biforme							
Ulmus americana							
Ulmus rubra							
Bark				X			
Brick						X	
Paint							
Steel							
Fiberglass boat frame							
Cloth							
Granite							
Wood	X		X		X		
Limestone						X	
Concrete	X						
Dolomite, pebbles, gravel							

Tree Species/Substrate	Lichen Species						
	Opegrapha varia	*Parmelia sulcata*	*Parmotrema hypotropum*	*Parmotrema reticulatum*	*Phaeocalicium polyporaeum*	*Phaeophyscia ciliata*	*Phaeophyscia hirsuta*
Acer negundo							
Acer platanoides							
Acer saccharinum			X	X			
Acer saccharum			X				
Betula papyrifera							
Carya ovata							
Catalpa speciosa							
Celtis occidentalis	X		X				
Crataegus crus-galli							
Crataegus mollis							
Fagus species							
Fraxinus americana							
Fraxinus quadrangulata							X
Fraxinus pennsylvanica var. subintegerrima			X	X			X
Gingko biloba							
Gleditsia triacanthos		X	X				
Gymnocladus dioica							
Juglans nigra							X
Juniperus virginiana							
Larix decidua							
Liquidambar styraciflua				X			X
Liriodendron tulipifera							
Lonicera species							
Maclura pomifera							
Morus alba							
Picea pungens							
Pinus strobis							
Platanus occidentalis							
Populus alba							
Populus deltoides						X	X
Prunus serotina			X				
Prunus species			X				
Pseudotsuga menziesii							
Ptelea trifoliata							
Quercus alba							
Quercus imbricaria							
Quercus macrocarpa							
Quercus palustris							
Quercus rubra			X	X			
Rhus glabra							
Rhus radicans							
Robinia pseudoacacia							
Rubus species							
Trichaptum biforme					X		
Ulmus americana							
Ulmus rubra							
Bark		X					
Brick							
Paint							
Steel							
Fiberglass boat frame							X
Cloth							
Granite		X					X
Wood		X	X	X		X	X
Limestone							X
Concrete							X
Dolomite, pebbles, gravel							

Tree Species/Substrate	Lichen Species						
	Phaeophyscia pusilloides	*Phaeophyscia rubropulchra*	*Physcia aipolia*	*Physcia americana*	*Physcia millegrana*	*Physcia stellaris*	*Physciella chloantha*
Acer negundo							X
Acer platanoides							
Acer saccharinum	X				X	X	X
Acer saccharum	X		X		X	X	X
Betula papyrifera					X		
Carya ovata	X				X		
Catalpa speciosa					X		X
Celtis occidentalis					X	X	X
Crataegus crus-galli						X	
Crataegus mollis		X			X	X	
Fagus species					X	X	
Fraxinus americana		X				X	
Fraxinus quadrangulata			X		X	X	X
Fraxinus pennsylvanica var. subintegerrima		X			X	X	X
Gingko biloba			X		X	X	
Gleditsia triacanthos					X	X	
Gymnocladus dioica					X		
Juglans nigra		X	X		X	X	X
Juniperus virginiana							
Larix decidua					X		
Liquidambar styraciflua			X		X	X	X
Liriodendron tulipifera			X		X	X	
Lonicera species					X		
Maclura pomifera	X				X	X	X
Morus alba					X	X	
Picea pungens					X	X	X
Pinus strobis					X	X	X
Platanus occidentalis	X	X			X	X	X
Populus alba					X		
Populus deltoides				X	X	X	X
Prunus serotina					X	X	X
Prunus species							
Pseudotsuga menziesii					X		
Ptelea trifoliata					X		
Quercus alba					X	X	X
Quercus imbricaria	X				X	X	X
Quercus macrocarpa					X	X	X
Quercus palustris		X					
Quercus rubra		X			X	X	X
Rhus glabra					X	X	
Rhus radicans					X		
Robinia pseudoacacia					X		
Rubus species					X	X	
Trichaptum biforme							
Ulmus americana	X				X	X	
Ulmus rubra							
Bark					X		
Brick							
Paint					X	X	
Steel					X	X	X
Fiberglass boat frame					X	X	X
Cloth					X		
Granite					X		
Wood					X	X	
Limestone							X
Concrete					X	X	X
Dolomite, pebbles, gravel							

Tree Species/Substrate	Lichen Species						
	Physconia leucoleiptes	*Punctelia bolliana*	*Punctelia missouriensis*	*Punctelia rudecta*	*Rinodina oxydata*	*Thelidium zwackhii*	*Trapeliopsis flexuosa*
Acer negundo							
Acer platanoides							
Acer saccharinum				X			
Acer saccharum			X				
Betula papyrifera							
Carya ovata							
Catalpa speciosa							
Celtis occidentalis			X				
Crataegus crus-galli							
Crataegus mollis							
Fagus species		X					
Fraxinus americana							
Fraxinus quadrangulata				X			
Fraxinus pennsylvanica var. subintegerrima				X			
Gingko biloba							
Gleditsia triacanthos							
Gymnocladus dioica							
Juglans nigra	X			X			
Juniperus virginiana							
Larix decidua							
Liquidambar styraciflua				X			
Liriodendron tulipifera				X			
Lonicera species							
Maclura pomifera							
Morus alba							
Picea pungens							
Pinus strobis							
Platanus occidentalis							
Populus alba							
Populus deltoides							
Prunus serotina							
Prunus species		X	X				
Pseudotsuga menziesii				X			
Ptelea trifoliata							
Quercus alba		X	X	X			
Quercus imbricaria				X			
Quercus macrocarpa			X				
Quercus palustris							
Quercus rubra				X			
Rhus glabra							
Rhus radicans							
Robinia pseudoacacia							
Rubus species							
Trichaptum biforme							
Ulmus americana							
Ulmus rubra							
Bark							
Brick							
Paint							
Steel							
Fiberglass boat frame							
Cloth							
Granite					X		
Wood			X	X			X
Limestone	X						
Concrete	X						
Dolomite, pebbles, gravel						X	

Tree Species/Substrate	Lichen Species			
	Verrucaria muralis	*Xanthomendoza fallax*	*Xanthomendoza fulva*	*Xanthoparmelia conspersa*
Acer negundo				
Acer platanoides				
Acer saccharinum		X		
Acer saccharum		X		
Betula papyrifera				
Carya ovata				
Catalpa speciosa			X	
Celtis occidentalis		X		
Crataegus crus-galli				
Crataegus mollis			X	
Fagus species		X		
Fraxinus americana				
Fraxinus quadrangulata				
Fraxinus pennsylvanica var. subintegerrima				
Gingko biloba				
Gleditsia triacanthos		X		
Gymnocladus dioica				
Juglans nigra		X		
Juniperus virginiana			X	
Larix decidua				
Liquidambar styraciflua				
Liriodendron tulipifera				
Lonicera species				
Maclura pomifera				
Morus alba				
Picea pungens				
Pinus strobis				
Platanus occidentalis				
Populus alba				
Populus deltoides		X		
Prunus serotina		X	X	
Prunus species				
Pseudotsuga menziesii				
Ptelea trifoliata				
Quercus alba			X	
Quercus imbricaria				
Quercus macrocarpa		X		
Quercus palustris				
Quercus rubra		X		
Rhus glabra				
Rhus radicans				
Robinia pseudoacacia				
Rubus species				
Trichaptum biforme				
Ulmus americana				
Ulmus rubra				
Bark				
Brick				
Paint		X	X	
Steel				
Fiberglass boat frame				
Cloth				
Granite				X
Wood			X	
Limestone			X	
Concrete				
Dolomite, pebbles, gravel	X			

Table 1. List of study locations, nearest city, number of timed surveys conducted and approximate size.

Study location	Nearest city	Number of surveys	Size
Atlanta Municipal parks	Atlanta	2	< 4.047 ha
Bell-Rose Nature Preserve	Atlanta	1	28.734 ha
Broadwell along roadside	Broadwell	1	< 4.047 ha
Chestnut-Beason Park District	Chestnut-Beason	1	< 10.118 ha
Edward R. Madigan State Park	Lincoln	4	394.178 ha
Elkhart Cemetery	Elkhart	2	< 10.118 ha
Elkhart Grove Nature Preserve	Elkhart	2	55.039 ha
Emden along roadside	Emden	1	< 4.047 ha
Gillett Farm	Elkhart	1	283.29 ha
Holy Cross Cemetery	Lincoln	1	< 10.118 ha
Kickapoo Creek County Park	Lincoln	3	135.575 ha
Latham Park	Lincoln	1	< 4.047 ha
Lincoln Cemetery	Lincoln	1	< 20.235 ha
Mount Pulaski Courthouse	Mount Pulaski	1	< 4.047 ha
New Union Cemetery	Lincoln	1	< 20.235 ha
Old Union Cemetery	Lincoln	1	< 20.235 ha
Postville Courthouse	Lincoln	1	< 4.047 ha