

THE LICHEN FLORA OF HOOSIER PRAIRIE STATE NATURE PRESERVE

Richard D. Hyerczyk
5204 South Natoma Avenue
Chicago, Illinois 60603-1222

ABSTRACT: Twenty-nine species of lichens are reported from Hoosier Prairie State Nature Preserve in Lake County, Indiana. Thirteen are of the crustose growth form, thirteen are foliose, and three are fruticose. An annotated species list with information on the habitats and distribution for each species is provided. The results of this study indicate that lichenized fungi are relatively uncommon at this nature preserve.

KEYWORDS: Arenicolous, corticolous, crustose, foliose, fruticose, lichen, lignicolous, saxicolous.

INTRODUCTION

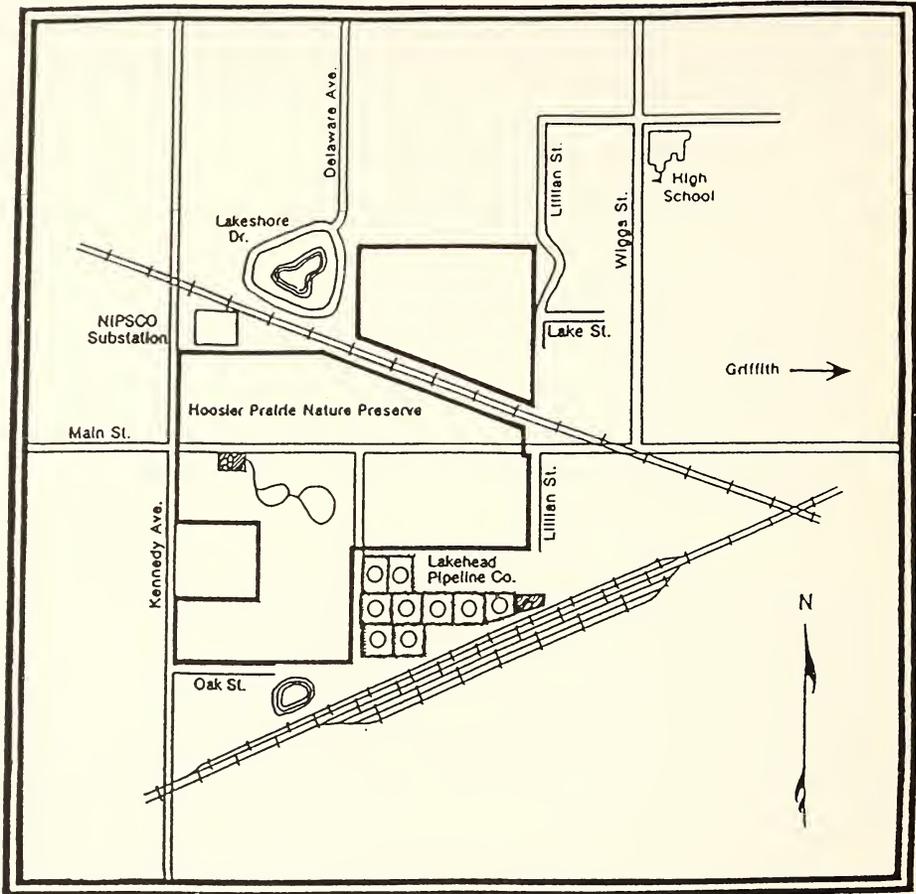
The Hoosier Prairie State Nature Preserve is located about 43 km (27 miles) southeast of downtown Chicago in Lake County, Indiana (Figure 1). This 177 hectare (439 acre) State Nature Preserve, which is located in the Northwestern Morainal Natural Region (Homoya, *et al.*, 1985), is owned and managed by the Indiana Department of Natural Resources. The prairie developed on beach sand lying over lake bottom clay after Lake Michigan water levels receded from this area about 9,000 years ago.

The topography is nearly level, with the elevation averaging 189 m (620 feet). Soils are generally sandy and predominantly of the Brems, Maumee, and Watseka Series (Persinger, 1972). For northwestern Indiana, the average January temperature ranges from a high of -1° C (30° F) to a low of -9° C (16° F), and the average July temperature, from a high of 28° C (83° F) to a low of 17° C (63° F). An average of 91 cm (36") of precipitation falls per year (Bair, 1992).

Several natural communities are found at Hoosier Prairie. Dry savannas occur on sand rises and are dominated by *Quercus alba* L. and *Q. velutina* Lam. Mesic sand prairie openings lie between the rises and swales and are dominated by *Populus deltoides* Marshall, *P. tremuloides* Michx., and *Salix interior* Rowlee. Wet prairies, sedge meadows, and marshes are scattered throughout the preserve in depressions and flats.

Management of the prairie includes brush cutting and prescribed burning. Other human influences include concrete curbing in a gravel parking lot, wood rail fencing, a mowed hiking trail, and a few piles of concrete rubble. The surrounding land is approximately 75% residential and 25% industrial.

Hoosier Prairie is within the boundaries of Calkins' (1896) flora, but none of the 125 species he reported were cited specifically from Lake County, Indiana. Wetmore (1986) reported 62 species of lichens from the Indiana Dunes National Lakeshore, but he did not include any from nearby Hoosier Prairie.



Hoosier Prairie State Nature Preserve

Map courtesy of the Indiana Department of Natural Resources:
Division of Nature Preserves

Figure 1. Hoosier Prairie Nature Preserve.

Since no lichenological studies were conducted in Hoosier Prairie, the purpose of this study was to provide information on the habitats and distribution of the lichen flora there.

MATERIALS AND METHODS

Between August 1991 and April 1997, six trips were made to Hoosier Prairie to collect voucher specimens and information on the habitats of these lichens.

Spot tests for chemical substances were made on the collected specimens using sodium hypochlorite and potassium hydroxide. Thin-layer chromatography (Culbertson, 1972) was used to verify secondary-product chemistry of the *Cladoniae*. Specimens were identified using keys by Brodo (1988), Hale (1979), and Wilhelm (1995). A set of voucher specimens has been deposited in the herbariums at the Indiana Dunes National Lakeshore, Porter, Indiana, and at the Morton Arboretum, Lisle, Illinois.

RESULTS AND DISCUSSION

Twenty-nine species of lichenized fungi in 19 genera are reported from Hoosier Prairie State Nature Preserve (see Checklist). Thirteen species are of the crustose growth form, thirteen are foliose, and three are fruticose. Two species were common, three were frequent, ten were occasional, and fourteen were rare. The most common lichens were *Candelaria concolor* and *Physcia millegrana*. These two species are ubiquitous throughout northwestern Indiana.

Nearly 62% of the flora was generally found on corticolous substrates (*Quercus*, *Populus*, and *Salix* spp.), 17% was lignicolous (on a wooden fence around the parking lot and on decorticate logs), 14% was saxicolous (on concrete curbing and rubble), and 7% was arenicolous (on sandy soil).

Only 11 of the 125 species reported by Calkins were found at Hoosier Prairie. Of the 62 species reported by Wetmore, only 17 were found. The study areas of both Calkins and Wetmore were much larger than Hoosier Prairie and probably had more habitats and substrates available for lichen colonization. Eleven species of lichens were found that were not included in Calkins' and Wetmore's studies. At least 6 of those species were found on substrates that were brought in for construction of the parking lot (concrete and wood) and were not found in a natural setting.

The effect prescribed burning is having on the Hoosier Prairie lichen flora is not known, and no attempt was made to determine this. However, Wetmore (1981) mentions that frequent burning reduces lichen abundance, which may account for their low numbers here.

ACKNOWLEDGMENTS

The author would like to thank Dr. Gerould Wilhelm and Linda Masters, both of Conservation Design Forum, Inc., Elmhurst, Illinois, for doing the thin-layer chromatography on the *Cladoniae* and for their help and assistance in the identification and verification of specimens. Also, thanks to Tom Post, Regional Ecologist with the Indiana Department of Natural Resources, and John A. Bacone, Director of the Indiana Division of Natural Resources, for permission to do this study at an Indiana State Nature Preserve and to two anonymous reviewers for their comments and suggestions. Finally, thanks to volunteer Deb Petro for initially suggesting a lichen study at Hoosier Prairie and for showing me around the Nature Preserve.

LITERATURE CITED

- Bair, F.E. 1992. The weather almanac, 6th ed. Gale Research, Inc., Detroit, Michigan, 855 pp.
- Brodo, I.M. 1988. Lichens of the Ottawa region, 2nd ed. Nat. Mus. Natur. Sci., Ottawa, Canada, 115 pp.
- Calkins, W.W. 1896. The lichen flora of Chicago and vicinity. Chicago Acad. Bull. 1, 50 pp.
- Culberson, C.F. 1972. Improved conditions and new data for the identification of lichen products by a standardized thin-layer chromatography method. J. Chromatogr. 72: 113-125.
- Esslinger, T. and R.C. Egan. 1995. A sixth checklist of the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. The Bryologist 98(4): 467-549.
- Hale, M.E., Jr. 1979. How to know the lichens, 2nd ed. Wm. C. Brown Co., Dubuque, Iowa, 246 pp.
- Homoya, M.A., D.B. Abrell, J.R. Aldrich, and T.W. Post. 1985. The natural regions of Indiana. Proc. Indiana Acad. Sci. 94: 245-268.
- Persinger, I.D. 1972. Soil survey of Lake County, Indiana. Purdue Univ. Agr. Exp. Station. U.S. Dep. Agr. Soil Conser. Serv., 66 pp.
- Wetmore, C.M. 1981. Lichen studies on Allison Savanna. J. Minnesota Acad. Sci. 47: 2-3.
- _____. 1986. Lichens and air quality in the Indiana Dunes National Lakeshore. Mycotaxon 33: 25-39.
- Wilhelm, G. 1995. Lichens of the Chicago region. Unpub. manuscript, 95 pp.

**CHECKLIST OF THE LICHENS OF HOOSIER PRAIRIE STATE
NATURE PRESERVE**

The following is an annotated list of the lichenized fungi collected at Hoosier Prairie. Their arrangement is alphabetical by genus and then species. Presence, along with a brief description of habitat, is followed by the growth form and substrate(s), which are listed in brackets. The collection number is given in parentheses. All collections were made by the author. Nomenclature and authority follow Esslinger and Egan (1995). Lichens reported by Wetmore (1986) are indicated by a "W."

Amandinea Choisy *ex* Scheid. & H. Mayrh.

Amandinea punctata (Hoffm.) Coppins & Scheid. Rare; on a weathered wood rail fence (196). [CRUSTOSE / LIGNICOLOUS]. W.

Anisomeridium (Müll. Arg.) Choisy

Anisomeridium nyssigenum (Ellis & Everh.) R.C. Harris. Rare; on the lower trunk of *Quercus alba* in a shaded mesic woodland (1371). The conidial state of this lichen, which has been called *Sarcinulella banksiae* Sutton & Alcorn, is represented here. [CRUSTOSE / CORTICOLOUS].

Arthonia Ach.

Arthonia caesia (Flotow) Körber. Occasional; on the trunks of *Populus tremuloides* and *Quercus velutina* (201). [CRUSTOSE / CORTICOLOUS]. W.

Caloplaca Th. Fr.

Caloplaca feracissima H. Magn. Rare; on weathered concrete curbing (250). [CRUSTOSE / SAXICOLOUS]. W.

Caloplaca holocarpa (Hoffm. *ex* Ach.) M. Wade. Occasional; on a weathered wood rail fence and a decorticate log (350). [CRUSTOSE / LIGNICOLOUS].

Caloplaca microphyllina (Tuck.) Hasse. Rare; on a weathered wood rail fence (193). [CRUSTOSE / LIGNICOLOUS].

Candelaria A. Massal.

Candelaria concolor (Dickson) Stein. Common; on the lower branches of *Populus deltoides* and *Quercus velutina* (206). [FOLIOSE / CORTICOLOUS]. W.

Candelaria concolor var. *effusa* (Tuck.) G. Merr & Burnham. Occasional; on the trunks of *Populus deltoides* and *Quercus velutina* (813). [FOLIOSE / CORTICOLOUS].

***Candelariella* Müll. Arg.**

Candelariella reflexa (Nyl.) Lettau. Occasional; on a weathered wood rail fence and lower branches of *Quercus velutina* (1368). [CRUSTOSE / CORTICOLOUS - LIGNICOLOUS].

***Cladonia* P. Browne**

Cladonia peziziformis (With.) J.R. Laundon. Rare; on sandy soil along a mowed hiking trail (214). [FRUTICOSE / ARENICOLOUS]. W.

Cladonia polycarpoides Nyl. Rare; on sandy soil in a wet depression with *Drosera intermedia* (346). [FRUTICOSE / ARENICOLOUS]. W.

Cladonia ramulosa (With.) J.R. Laundon. Occasional; at the base of *Quercus velutina* (1372). [FRUTICOSE / CORTICOLOUS]. W.

***Cyphelium* Ach.**

Cyphelium tigillare (Ach.) Ach. Rare; on a weathered wood rail fence (1494). [CRUSTOSE / LIGNICOLOUS].

***Endocarpon* Hedwig**

Endocarpon pusillum Hedwig. Rare; on concrete rubble (812). [CRUSTOSE / SAXICOLOUS]. W.

***Flavopunctelia* (Krog) Hale**

Flavopunctelia flaventior (Stirton) Hale. Rare; on the lower trunk of *Quercus rubra* (205-A). [FOLIOSE / CORTICOLOUS].

***Hyperphyscia* Müll. Arg.**

Hyperphyscia adglutinata (Flörke) H. Mayrh. & Poelt. Occasional; on a decorticate oak log and on the lower branches of *Quercus velutina* (1318, 1370) and *Salix interior* (1373). [FOLIOSE / CORTICOLOUS - LIGNICOLOUS].

***Lecanora* Ach.**

Lecanora dispersa (Pers.) Sommerf. Rare; on weathered concrete curbing (253). [CRUSTOSE / SAXICOLOUS]. W.

Lecanora strobilina (Sprengel) Kieffer. Rare; on the lower trunk of *Quercus alba* (1495). [CRUSTOSE / CORTICOLOUS].

Lecanora symmicta (Ach.) Ach. Frequent; on the lower trunks of *Quercus velutina* (202) and *Salix interior* and on a weathered wood rail fence (192). [CRUSTOSE / CORTICOLOUS-LIGNICOLOUS].

***Melanelia* Essl.**

Melanelia subaurifera (Nyl.) Essl. Rare; on the lower branches of *Salix interior* (1496). [FOLIOSE / CORTICOLOUS].

***Parmelia* Ach.**

Parmelia sulcata Taylor. Frequent; on the lower branches of *Populus tremuloides* (224), *Quercus velutina*, and *Salix interior* (207). [FOLIOSE / CORTICOLOUS]. W.

***Phaeophyscia* Moberg**

Phaeophyscia pusilloides (Zahlbr.) Essl. Occasional; at the base of *Quercus velutina* (815) [FOLIOSE / CORTICOLOUS]. W.

Phaeophyscia rubropulchra (Degel.) Essl. Occasional; at the bases of *Populus deltoides* (210) and *Salix interior* (1369). [FOLIOSE / CORTICOLOUS]. W.

***Physcia* (Schreber) Michaux**

Physcia adscendens (Fr.) H. Olivier. Occasional; on the lower trunk of *Populus deltoides* (211). [FOLIOSE / CORTICOLOUS]. W.

Physcia millegrana Degel. Common; on the trunks and lower branches of *Populus deltoides*, *Quercus velutina* (198), and *Salix interior* (213). [FOLIOSE / CORTICOLOUS]. W.

Physcia stellaris (L.) Nyl. Frequent; on the trunks and lower branches of *Populus deltoides* and *Quercus velutina* (209). [FOLIOSE / CORTICOLOUS]. W.

***Punctelia* Krog**

Punctelia rudecta (Ach.) Krog. Rare; on the trunk of *Quercus rubra* (205). [FOLIOSE / CORTICOLOUS]. W.

***Thelidium* Massal.**

Thelidium microcarpum (Leight.) A.L. Sm. Rare; on concrete rubble (344). [CRUSTOSE / SAXICOLOUS].

***Xanthoria* (Fr.) Th. Fr.**

Xanthoria fallax (Hepp) Arnold. Occasional; on the lower branches of *Quercus velutina* (814) and on a wood rail fence (251). [FOLIOSE / CORTICOLOUS - LIGNICOLOUS]. W.

