

Macrolichen Flora of Crane Hollow, Hocking County, Ohio¹

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ABSTRACT. The macrolichen flora of Crane Hollow, Hocking County, Ohio, was investigated, and 77 species were found. Twenty-three species are new records for Hocking County, five are on the Ohio Biological Survey endangered and threatened plant list, and one, *Parmotrema arnoldii* (DR.) Hale, is new to Ohio.

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INTRODUCTION

Crane Hollow in Laurel Township, Hocking County, Ohio, is a deep gorge cut through Mississippian sandstone, and is topographically similar to some of the well-known Hocking County state parks. The topography, geology, soils, climate, and vascular plant flora of this area have been described by Lammers (1985). Crane Hollow is almost completely forested and has remained undisturbed in recent years. Most of Crane Hollow is owned and protected by Crane Hollow, Inc., a non-profit organization dedicated to nature preservation. The purpose of this study was to develop an inventory of the macrolichens present in Crane Hollow.

METHODS

Lichens were collected from tree bark, soil, and rock substrates. Most collections were from dry, sunny places such as mixed oak or pine forests on ridge tops or south- and west-facing slopes, south- and west-facing sandstone outcrops, and soil at the top of sandstone outcrops. These sites contained the most diverse lichen flora. At more densely forested sites, lichens were restricted to the upper branches of trees and were inaccessible unless a wind-thrown tree could be found. Old field habitats, which normally contain a number of *Cladonia* species, were rather sparse in this study area.

Lichens were identified with manuals by Taylor (1967, 1968) and Hale (1979). All nomenclature follows Hale (1979). A voucher collection of all species was deposited in The Ohio State University Lichen Herbarium.

RESULTS AND DISCUSSION

Seventy-seven macrolichen species were found in the Crane Hollow study area (Table 1). Twenty-three species are new records for Hocking County, five are on the Ohio Biological Survey (OBS) endangered and threatened plant list (Cooperrider 1982), and one is a new record for Ohio. The following are brief comments about the one Ohio record and five threatened and endangered species.

Baeomyces absolutus. This species is reported as rare by Hale (1979) and is put in the threatened category on the OBS list (Showman 1982). In Ohio, there are early (pre-1950) records from Adams and Fairfield counties. One extant population is known from Athens County. This species was found growing on moist, shaded sandstone outcrops at several locations in Crane Hollow.

Dermatocarpon tuckermanii. This eastern United States species grows on trees, especially white oak (*Quercus alba* L.), in open woods. It is thought to be widespread but not commonly found. It is listed as "status undetermined" by the OBS publication (Showman 1982). In Ohio, pre-1950 records are known from three counties. There is one recent record from Adams County (Kaucher and Snyder 1982). In the Crane Hollow area, a

TABLE 1

The Macrolichen Flora of Crane Hollow, Hocking County, Ohio. *, species listed in Cooperrider (1982); NH, new species for Hocking County; NO, new species for Ohio.

| | |
|--------------------------------------------------|------|
| <i>Anaptychia palmatula</i> (Michx.) Vain. | |
| <i>Baeomyces absolutus</i> Tuck. | * NH |
| <i>B. fungoides</i> (Sw.) Ach. | |
| <i>Candelaria concolor</i> (Dicks.) Stein. | NH |
| <i>Cetraria ciliaris</i> Ach. | |
| <i>C. fendleri</i> (Nyl.) Tuck. | |
| <i>C. oakesiana</i> Tuck. | |
| <i>Cladina rangiferina</i> (L.) Harm. | |
| <i>C. subtenuis</i> (Abb.) Hale & Culb. | |
| <i>Cladonia apodocarpa</i> Robb. | |
| <i>C. caespiticia</i> (Pers.) Flk. | |
| <i>C. caroliniana</i> (Schwein.) Tuck. | |
| <i>C. coniocraea</i> (Flk.) Spreng. | |
| <i>C. cristatella</i> Tuck. | |
| <i>C. cylindrica</i> (Evans) Evans | |
| <i>C. furcata</i> (Huds.) Schrad. | |
| <i>C. piedmontensis</i> Merr. | NH |
| <i>C. polycarpoides</i> Nyl. | |
| <i>C. pyxidata</i> (L.) Hoffm. | |
| <i>C. squamosa</i> (Scop.) Hoffm. | |
| <i>C. uncialis</i> (L.) Wigg. | |
| <i>C. verticillata</i> (Hoffm.) Schaer. | |
| <i>Collema subflaccidum</i> Degel. | NH |
| <i>Dermatocarpon fluviatile</i> (G. Web.) Th.Fr. | |
| <i>D. tuckermanii</i> (Rav.) Zahlbr. | * NH |
| <i>Heterodermia obscurata</i> (Nyl.) Trev. | NH |
| <i>H. speciosa</i> (Wulf.) Trev. | |
| <i>Hypogymnia physodes</i> (L.) Nyl. | |
| <i>Hypotrachyna livida</i> (Tayl.) Hale | NH |
| <i>H. showmanii</i> Hale | * NH |
| <i>Lasallia papulosa</i> (Ach.) Llano | |
| <i>Leptogium cyanescens</i> (Ach.) Korb. | |
| <i>L. tenuissimum</i> (Dicks.) Fr. | * NH |
| <i>Lobaria quercizans</i> Michx. | |
| <i>Parmelia flaventior</i> Stirt. | NH |
| <i>P. rudecta</i> Ach. | |
| <i>P. squarrosa</i> Hale | |
| <i>P. subaurifera</i> Nyl. | |
| <i>P. subrudecta</i> Nyl. | |
| <i>P. sulcata</i> Tayl. | |
| <i>P. ulophyllodes</i> (Vain.) Sav. | NH |
| <i>Parmelina aurulenta</i> (Tuck.) Hale | |
| <i>P. dissecta</i> (Nyl.) Hale | |
| <i>P. galbina</i> (Ach.) Hale | |
| <i>Parmeliopsis aleurites</i> (Ach.) Nyl. | |
| <i>P. placodioides</i> (Ach.) Nyl. | |
| <i>Parmotrema arnoldii</i> (DR.) Hale | NO |
| <i>P. hypotropum</i> (Nyl.) Hale | NH |
| <i>P. perlatum</i> (Huds.) Choisy | NH |
| <i>P. stippeum</i> (Tayl.) Hale | NH |
| <i>P. xanthinum</i> (Muell. Arg.) Hale | NH |
| <i>Peltigera canina</i> (L.) Willd. | |
| <i>Phaeophyscia adiantola</i> (Essl.) Essl. | |
| <i>P. imbricata</i> (Vain.) Essl. | |
| <i>P. pusilloides</i> (Zahlbr.) Essl. | |
| <i>P. rubropulchra</i> (Degel.) Moberg | |
| <i>Physcia aipolia</i> (Ehrh.) Hampe | |
| <i>P. americana</i> Merr. | |

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TABLE 1 (continued)

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|---------------------------------------------------------|------|
| <i>P. chloantha</i> Ach. | |
| <i>P. millegrana</i> Degel. | |
| <i>P. stellaris</i> (L.) Nyl. | |
| <i>Physconia deterosa</i> (Nyl.) Poelt | |
| <i>Platismatia tuckermanii</i> (Oakes) Culb. & Culb. | NH |
| <i>Pseudoparmelia baltimorensis</i> (Gyel. & For.) Hale | |
| <i>P. caperata</i> (L.) Hale | |
| <i>P. crozalsiana</i> (Lesd.) Hale | NH |
| <i>Pycnothelia papillaria</i> (Ehrh.) Duf. | |
| <i>Pyxine caesiopruinosa</i> (Nyl.) Imsh. | NH |
| <i>P. sorediata</i> (Ach.) Mont. | |
| <i>Ramalina intermedia</i> Nyl. | |
| <i>R. petrina</i> Bowler & Rund. | * NH |
| <i>Umbilicaria mammulata</i> (Ach.) Tuck. | |
| <i>Usnea strigosa</i> (Ach.) Eaton | NH |
| <i>Xanthoparmelia conspersa</i> (Ach.) Hale | |
| <i>X. plittii</i> (Gyel.) Hale | NH |
| <i>X. taractica</i> (Krempfh.) Hale | |
| <i>Xanthoria fallax</i> (Hepp) Arn. | NH |

good population of *D. tuckermanii* was found on three white oaks on a southwest-facing slope at the mouth of Young Hollow.

Hypotrachyna showmanii. This species was discovered in 1975 at the type location in Vinton County, Ohio. It is found almost exclusively in dry, sunny locations on trees with hard, acidic bark such as black oak (*Quercus velutina* Lam.) and chestnut oak (*Q. montana* Willd.). Hale (1976, 1979) considers it very rare in the eastern United States. It is listed as "threatened" in the OBS endangered and threatened plant list (Showman 1982). In Ohio, it has now been found in Adams, Jackson, Meigs, Scioto, and Vinton counties. At Crane Hollow, there is a well-developed population of *H. showmanii*. It was found at numerous sites around the rim of the gorge, primarily on chestnut oak but also on black and scarlet oak (*Q. coccinea* Muenchh.).

Leptogium tenuissimum. This lichen is reported as widely distributed in the United States. However, it is listed as "threatened" in Ohio (Showman 1982). A pre-1950 record is known from Butler County, and there is a recent record from Clinton County. In the Crane Hollow study area, this species was found growing over shaded moss at the base of a black oak tree.

Parmotrema arnoldii. According to Hale (1979), this lichen is common on trees in open forests in the West, but rather rare in the East. This species is new for Ohio, and thus is not listed in Cooperrider (1982). However, under the criteria used, it should be considered threatened. In Crane Hollow, *P. arnoldii* was found on an upper limb of a wind-thrown red oak (*Quercus borealis* Michx. f.).

Ramalina petrina. When this species was described in 1974, it was known from only six Appalachian locations (Bowler and Rundel 1974). It is classified as "threatened" on the OBS list (Showman 1982). In Ohio, extant populations occur in Jackson and Meigs counties where it grows on dry sandstone cliffs. In the Crane Hollow study area, *R. petrina* was found on dry, sunny sandstone on the west side of Hood Hollow.

The Crane Hollow study area provides excellent habitat for lichens, and several lichen communities are especially well-developed there. These communities for the

most part are unique to a certain kind of substrate. The substrates and their associated lichen communities are listed below.

Virginia Pine Groves. Virginia pine was found, sometimes with oak species, on dry, exposed locations. Typical sites were near the top of sandstone cliffs on south- or west-facing slopes. The lichens usually associated with Virginia pine were *Cetraria ciliaris*, *C. fendleri*, *Platismatia tuckermanii*, *Parmeliopsis aleurites*, and *P. placorodia*.

Mixed Oaks. Dry sites above the rock contained an association of oaks dominated by chestnut oak, but also containing black and scarlet oaks, all acidic, hard-barked species. These trees commonly supported a number of lichens including: *Hypotrachyna livida*, *H. showmanii*, *Parmelia rudecta*, *P. squarrosa*, *P. subrudecta*, *P. sulcata*, *Parmelina aurulenta*, *P. dissecta*, *Parmeliopsis aleurites*, *Parmotrema hypotropum*, *P. stuppeum*, *Physcia millegrana*, *P. stellaris*, *Pseudoparmelia caperata*, and *Pyxine sorediata*. The following less common species were also found: *Cetraria oakesiana*, *Heterodermia obscurata*, *H. speciosa*, *Hypogymnia physodes*, *Parmelia subaurifera*, *Physcia aipolia*, *P. americana*, *Pseudoparmelia crozalsiana*, and *Usnea strigosa*.

Dry Sandstone. South- or west-facing sandstone cliffs provided excellent habitat for the following lichens: *Cladonia squamosa*, *Lasallia papulosa*, *Parmelina dissecta*, *Pseudoparmelia baltimorensis*, *Ramalina intermedia*, *Umbilicaria mammulata*, *Xanthoparmelia conspersa*, and *X. plittii*. Less frequently observed were: *Phaeophyscia adiastrum*, *Parmelia rudecta*, *Parmotrema xanthinum*, *Ramalina petrina*, and *Xanthoparmelia taractica*.

Dry Soil. Dry, thin soil on top of exposed sandstone cliffs supported a number of soil lichens. These areas were called "Lichen Ericad Openings" by Lammers (1985). Lichens commonly present were: *Cladonia rangiferina*, *C. subtenuis*, *Cladonia apodocarpa*, *C. coniocraea*, *C. cristatella*, *C. pyxidata*, *C. squamosa*, and *C. uncialis*. *Cladonia caroliniana*, *C. furcata*, and *Pycnothelia papillaria* were observed less frequently.

A total of 77 macrolichen species were found in the Crane Hollow area. This number indicates a very rich and diverse lichen flora for such a relatively small area. By comparison, Showman (1985) found 98 macrolichen species in a study along the Ohio River near Cheshire, Ohio. However, this study covered approximately 4,000 km² and included a much greater assortment of habitats. In a study of Adams County nature preserves, Kaucher and Snider (1982) recorded 75 macrolichens at The Wilderness, 58 at Lynx Prairie, 60 at Buzzards Roost Rock and Red Rock Preserves, and 55 at Abner Hollow. The Crane Hollow Preserve may well contain the richest protected lichen flora in Ohio.

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