OBELISK

Ohio Bryology *et* Lichenology, Identification, Species, Knowledge

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Editor's Note This issue of OBELISK is dedicated to our student members, now totaling 15. These young people have shown a laudable curiosity and will to learn about bryophytes and lichens. This year's Left Hand Corner is authored by Jonathan Kubesch, a graduate student at The University of Tennessee - Knoxville, who worked with Bob Klips as an undergrad at OSU. The Flenniken Award goes for the second time to Tomás J. Curtis, a student at Kent State. Shaun Pogacnik, a student at Hocking College, reports on finding two species thought to be extirpated in Ohio. **Congratulations to all of our student members!**

LEFT HAND CORNER

THE IMPORTANCE OF COLLECTION AND CURATION

The fire in Brazil's National Museum this past year inspired some reflection on the nature of collection and curation. As many of the priceless antiquities and biological collections are now irreparably damaged, attention must now turn to preventing similar losses of valuable knowledge. Especially in the case of cryptogams, specimen collections can be so few and far between that a loss of one specimen might be the loss of an entire species from scientific documentation. Scientific knowledge on locality, substrate, and collector can be lost just as easily through the sheer size of collections. Like the Ark of the Covenant, a specimen can get lost in the aggregate packet boxes.

In cryptogams as well as the wider world of biology, specimen collections have been largely forgotten. Modern biological science emphasizes tissue cultures and project-specific living specimens over the careful examination of aged paper packets and archaic cursive labels. The genomics era with various molecular markers and colorful dyes briefly provided hopes that the 19th and 20th century specimens might provide clues to modern changes in global ecology. Unfortunately, most genomics work still remains focused on agricultural weeds, crops, or novelties; for the most part lichens and bryophytes remain fairly marginalized.

Luckily, the continuing efforts of the Ohio Moss and Lichen Association might yet counter these concerns over the fate of cryptogram specimens. Attention to existing collections and active curation maintain the scientific utility of old packets. Modern media tools increase public awareness of these historical resources. Imaging work at Ohio State's herbarium presently being carried with the help of OMLA members Bob Klips, Megan Osika, and others, ensures that specimens will be accessible and traceable as time continues on. This imaging is available to the wider public,

allowing anyone to retrieve a packet from anywhere with decent internet connection.

The author contributed to the imaging work underway at Ohio State, working through several sections of the legendary Don Flenniken's lichen collection. In addition to the value of distributions and physical material to analyze, these packets provide glimpses into the minds of collectors and curators. Though an 1871 Slovenian lichen may not directly influence the state of Ohio's lichen record, the history of collections and acquisitions demonstrates the morphological structures that informed the modern concept of lichens, as well as the nature of research programs.

In the end, as Ray Showman pointed out in an earlier Obelisk article, "The Value of Amateurs," collections need to keep being made. If not for the sake of forays, specimens should be regularly collected to back up the limited number of bryophytes and lichens globally curated. Most species can handle to have two or three packets of identical material kept in several collections across the state and country. Hopefully the active group of collectors and curators within this association may continue to grow. - **Jonathan Kubesch**

REPORT OF NEW MACROLICHENS FOR THE STATE OF OHIO

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Introduction

During the late months of 2017 through 2018 many noteworthy lichen records were found in Ohio. Macrolichens continued to be collected and identified as part of an ongoing study of Ohio lichens by the author. Here each macrolichen species new for the state of Ohio will be discussed individually. These new species include *Heppia adglutinata*, *Hypotrachyna revoluta*, *Melanelixia glabratula*, *Multiclavula corynoides*, *Tuckermanopsis sepincola*, *Usnea glabrata* and *Usnea subgracilis*.

Materials and Methods

Lichens were found and collected by the author at various sites throughout Ohio. Specimens cited below, as well as all the specimens related to this broader study, have been deposited at the Kent State University Herbarium (KE). They were examined using both a Stereomaster dissecting microscope and a Nikon Asphaphot-2 YS2 compound microscope. Standard spot tests were performed as well as thin-layer chromatography to study the metabolic biproducts that lichens often produce. Lichens were identified using Lendemer, J., Harris, R., and Tripp, E. (2013), Hinds, J. and Hinds, P. (2007), and Brodo, I. (2016).

NEW MACROLICHENS FOR OHIO

***Heppia adglutinata* (Krempelh.) A. Massal**.

Heppia adglutinata is a small terricolous cyanolichen in the family Heppiaceae. It has an olive to brown squamulose to peltate thallus and large red-brown immersed apothecia that generally develop singly in the center of a squamule. Its distribution includes most of the United States, from around the Great lakes and Northeastern United States to the Southwest. Despite having a broad range, it appears to be infrequent and rarely collected. In February of 2018, a population of *Heppia adglutinata* was located by the author at Castalia Quarry

Metroparks in Erie County, Ohio. It was a robust but isolated population growing on calcareous soil in the open quarry and associated with *Placidium squamulosum*.

Heppia adglutinata. **Photo by Tomás Curtis**

Specimen examined - U.S.A. OHIO. ERIE CO.: Castalia Quarry Metro Park, in quarry, 17 February 2018, on exposed calcareous soil, *Tomás J. Curtis (KE)*.

***Hypotrachyna revoluta* (Flörke) Hale**

Hypotrachyna revoluta is a medium-sized foliose lichen with loosely adnate lobes that become revolute and produce farinose soredia. The thallus is gray to green-gray and smooth with a faintly maculate to emaculate surface and a black undersurface. In the Eastern United States, this species is infrequent in the extreme northeast, around Lake Superior, and throughout the Southern and Central Appalachians. In January of 2018, a single thallus of *Hypotrachyna revoluta* was located by the author near Mohican Memorial State Forest in Ashland County, Ohio, near the dam of Pleasant Hill Lake. It was growing on a branch of *Acer rubrum* in a developed area near a parking lot. Almost a month later, a second thallus was found in an adjacent county at the Simco Wildlife Area. These Ohio locations are quite disjunct from other known records.

Hypotrachyna revoluta. **Photo by Tomás Curtis**

Specimens examined - U.S.A. OHIO. ASHLAND CO.: near Mohican Memorial State Forest, next to the Pleasant Hill Lake dam along County Road 3006, 11 January 2018, on branch of *Acer rubrum*, *Tomás J. Curtis (KE)*. U.S.A. OHIO. COSHOCTON CO.: Simco Wildlife Area, near Township Road 280, 9 February 2018, on bark of *Alnus glutinosa*. *Tomás J. Curtis (KE)*.

***Melanelixia glabratula* (Lamy) Sandler Berlin & Arup**

Melanelixia glabratula is an olive-brown to reddish-brown medium-sized foliose lichen with an adnate, pseudocyphellate thallus that produces relatively long, branched isidia. It is common throughout the Appalachians and the Pacific Northwest but also occurs scattered around the Great Lakes. In June of 2018, it was located by the author during the 2018 OMLA Summer Foray in Wayne County, Ohio near Kister Fen. It was found growing on an old sun-exposed wooden fence in a yard and associated with other uncommon and often lignicolous species such as *Calicium tigillare* and *Caloplaca microphyllina*.

Melanelixia glabratula. **Photo by Tomás Curtis**

Specimen examined - U.S.A. OHIO. WAYNE CO.: in yard just east of intersection between Kister Rd. and Willow Rd., close to Kister Fen, 9 June 2018, on a wooden fence rail, *Tomás J. Curtis (KE)*.

***Multiclavula corynoides* (Peck) R. Petersen**

Multiclavula corynoides is one of a small number of lichenized basidiomycete fungi that derive nutrients from green algae that have been incorporated into their tissue. The colonies grow on algal films over moist exposed soil, and the fruiting structures are erect, orange to pale orange-buff clubs that are often scattered within the algal film. It is represented by only two collections in the Eastern United States and is probably rare throughout its range, though collection bias may contribute towards this lack of representation. In June of 2018, *Multiclavula corynoides* was found by the author at Shaw Woods in Portage County, Ohio. It was growing in a large open power-line right-of-way over moist algae-covered soil and associated with species of *Dichanthelium*, *Danthonia*, *Rubus*, and moss.

Multiclavula corynoides. **Photo by Tomás Curtis**

Specimen examined – U.S.A. OHIO. PORTAGE CO. Shaw Woods (Portage Park District property), in the power line right-of-way, 7 June 2018, on exposed acidic soil with a superficial algal film, *Tomás J. Curtis (KE)*.

***Tuckermanopsis sepincola* (Ehrh.) Hale**

Tuckermanopsis sepincola is a small olive-brown to ashy-brown foliose lichen with raised lobes that often produce apothecia on the tip of the upper surface. The apothecia often become so abundant that the thallus is obscured beneath them. It is common north of the Great Lakes and through the Appalachians on branches and twigs of acidic shrubs and trees in open areas. In August of 2017, a single thallus of *Tuckermanopsis sepincola* was located at Towner's Woods in Portage County, Ohio. It was growing on a twig of *Chamaedaphne calyculata* in a small *Chamaedaphne* bog surrounded by forest.

Specimen examined – U.S.A. OHIO. PORTAGE CO. Towner's Woods (Portage Park District Property), 20 August 2017, on a *Chamaedaphne calyculata* twig, *Tomás J. Curtis (KE)*.

Tuckermanopsis sepincola. **Photo by Tomás Curtis**

***Usnea glabrata* (Ach.) Vain.**

Usnea glabrata is a small, shrubby, fruticose lichen with inflated branches that narrow at the base. The terminal branches usually produce large and often excavate soralia that lack isidiomorphs. These physical characteristics, combined with the production of protocetraric and fumarprotocetraric acid in the medulla, are diagnostic for this species. Known primarily from the West Coast, *Usnea glabrata* is known from Eastern/Central North America only by a handful of records from the Southern Appalachians and from above Lake Superior.

In December of 2017, a single thallus of this species was collected by the author at West Branch State Park in Portage County, Ohio. Fitting the physical description, the author brought the specimen to the 2018 Tuckerman Workshop for thin-layer chromatography to be performed by Dr. James C. Lendemer and the identification confirmed.

Specimen examined - U.S.A. Ohio. PORTAGE CO.: West Branch State Park, 9 December 2017, on a fallen *Fraxinus* tree branch, *Tomás J. Curtis (KE)*.

Usnea glabrata. **Photo by Curtis Björk**

***Usnea subgracilis* Vain**.

Usnea subgracilis is a light-green pendulous fruticose lichen with thin, smooth branches that produce small soralia towards the end and usually lack papillae and isidiomorphs. In Eastern North America, it is common in the Southern and Central Appalachians and in Nova Scotia, New Brunswick, and New England.

Usnea subgracilis. **Photo by Tomás Curtis**

In April of 2018, a single thallus was located at the Grand River Wildlife Area in Trumbull County, Ohio. It was found growing on smooth bark of a young *Acer rubrum* at the edge of a small wetland. The identification was confirmed by Dr. James C. Lendemer using thin-layer chromatography.

Specimen examined – U.S.A. OHIO. TRUMBULL CO. Grand River Wildlife Area, near shooting range on OH-88, 6 April 2018, on smooth bark of a young *Acer rubrum*, *Tomás J. Curtis (KE)*.

Discussion

Though the distributions of most lichen species are fairly well known, lichens never cease to surprise scientists with the disjunct records that are regularly found. Each species presented here represents a single record or a small cluster of records amid vast gaps in their range. Though not all these new records are necessarily surprising, each represents an extension of the range of a lichen. There are certainly other species of lichens waiting to be found throughout Ohio - a testament to the complexity and illusive nature of lichenized fungi.

Acknowledgments

I would like to give special thanks to Dr. James Lendemer, Ray Showman, Dr. Barbara Andreas, and any others who helped mentor me through my studies.

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"Consider the Lichen. Lichens are just about the hardiest visible organisms on Earth, but the least ambitious."
— **Bill Bryson**

LONG LOST MOSS FOUND (ALIVE)!

Goblin Gold (*Schistostega pennata*) is a one of a kind moss that had been reported only twice before in Ohio with the last sighting occurring about 125 years ago. OMLA member Bob Klips had a "**WANTED (ALIVE)**" article on this elusive moss in the 2010 issue of OBELISK (**1**). It is quite the rarity. The two previous Ohio records were from Geauga and Portage Counties. One was a specimen recorded from Geauga County near Thompson. This specimen was collected in 1893 by Otto Hacker (**2**). The second record was a literature record reporting that it was discovered somewhere in Portage County, possibly in the Nelson Kennedy Ledges area. In his **WANTED (ALIVE)** article, Klips mentions a 1919 paper in the Ohio Journal of Science by Edo Claassen titled "Mosses of several Ohio Counties" (**3**). He mentions a record for *Schistostega osmundacea* (an early synonym for the species) for Portage County stating that it was found on the ground in a cave. *Schistostega pennata* is a moss that has been searched for by many in Ohio through the years.

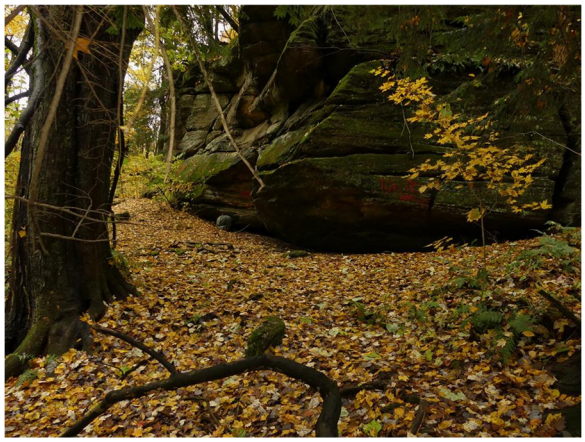
I was first introduced to Thompson Ledges in northeast Geauga County by Tomás Curtis, because of its great lichen diversity. On June 29, 2018, I was taking a friend from Hocking College there to see some of the lichens. After exploring the top we entered a crack in the sandstone that leads to the base of the cliff. We worked our way along the base of the cliff searching for lichens and other plants. As we walked along I looked down and noticed a strange fluorescent green glow on the ground. The ground would only glow when we looked at it from a certain angle. I got down and gave it a closer look and sure enough I saw the feather-like gametophytes and immediately knew what it might be. I had heard of Goblin Gold before this point, but was no expert on it.

Schistostega pennata, Thompson Ledges.
Photo by Shaun Pogacnick

As soon as I got home I started doing research and sent my pictures to Bob Klips, who responded quickly, was extremely enthusiastic about the find, and came up on July 3. He gave me the opportunity of collecting my first-ever specimen for a herbarium. This specimen has been deposited in the OSU Herbarium (catalog # OS0069081) (**4**). When word got out about this, Barbara Andreas and Diane Lucas also came up to see it! Barbara deposited a specimen in the Kent State University herbarium (catalog # KE B014611) (**4**).

The distribution map from the Consortium of North American Bryophyte Herbaria website shows that *Schistostega pennata* is scattered throughout North America, Asia, and Europe (**4**). The Thompson record is apparently one of the most southerly occurrences of it. It does not seem to be frequent anywhere in the world. The moss

listed as a [G3G4, rounded to G3] which is globally vulnerable by Nature Serve (**5**). It is not currently ranked in Ohio since there had been no recent records. According to Nature Serve it is not common anywhere. They estimate there to be about 300 occurrences worldwide with only 40 occurrences that have good viability. They estimate 2,500-10,000 individual plants worldwide. Nature Serve is composed of a group of biodiversity scientists who believe it is important to have the best information available when making conservation decisions. They have compiled the information to make it available to everyone.



The ledge where the *Schistostega* resides.
Photo by Shaun Pogacnick

Its habitat is varied. It has been described as occurring on mineral soils in crevices, in caves, on upturned root wads, and animal burrows (**6**). Where I found it, it was in dark wet crevices on Sharon Conglomerate sandstone and also on the ground below the sandstone ledges. It prefers to be in very damp humid locations, however it does not tolerate extreme wetness. If an area is too wet or too dry, the moss will disappear.

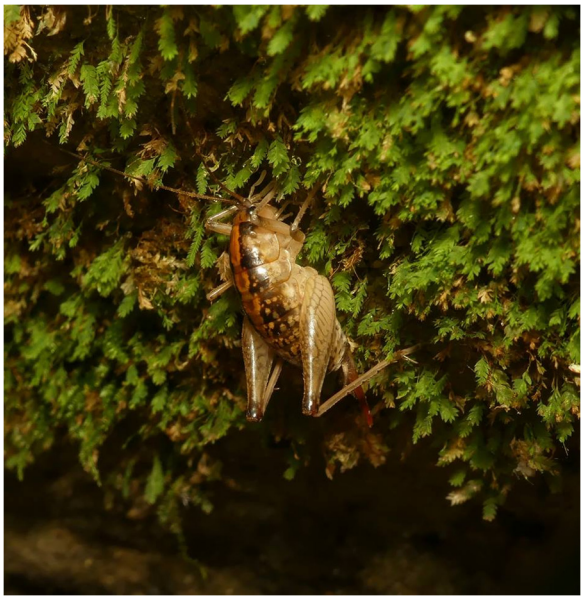
The habitat at Thompson Ledges is at the base of steep east-facing sandstone cliffs, shaded by eastern hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), sugar maple (*Acer saccharum*) and mountain maple (*A. spicatum*). The moss favors damp areas near seeps at the base of the cliff. One particular spot where I first discovered the moss was very mucky adjacent to it. The moss grew on soil that was damp, but not wet. This was where it first caught my eye. The seep in this area had an overhanging ledge that was less than 2 feet off the ground and extended to about 8 feet deep. Upon closer examination of this ledge I discovered some of the gametophytes growing right on the overhanging sandstone in a shallow crevice. Sporophytes were present but scarce. I also found a second location a little north of the original site. I examined ledges on the other side of the park north of the road which is less frequently used. There, I discovered two more populations which were much smaller. These populations were found in shallower overhangs along cracks of the sandstone. These locations were also damp.

Schistostega pennata is the only member of a single species family Schistostegaceae and is an acrocarp moss. It can be confused with *Fissidens* spp. which have similar gametophytes that have two-ranked leaves. On the gametophytes of *Schistostega*, the leaves are nerveless, while those *Fissidens* will have a distinct midrib. Sword moss (*Bryoxiphium norvegicum*) has the same leaf arrangement as well but the gametophytes are much more slender. The 3 mosses are pictured below for comparison.

From left to right *Schistostega, Fissidens, Bryoxiphium.*

They could also possibly be confused with *Caylpogeia* spp. liverworts which are also nerveless. Liverworts, however lack the peristome that is typical of mosses (**7**). What is unique about *Schistostega* is the persistent protonema. A protonema is a thread-like structure that is formed in the earliest stage (the haploid phase) in the life cycle of a moss. It forms "buds" which may turn into mosses. It is formed from a spore. In most mosses, the protonema disappears fairly quickly. In *Schistostega*, the protonema remains for some time and it also has flat outgrowths that develop perpendicular to the light. Inside these are spherical cells that act as lenses that will collect and concentrate even very faint light. The chloroplasts absorb the useful light wavelengths and reflect the remainder giving the moss its glow, and thus the name, Goblin Gold. Because the cells face the available light, the glow can disappear when looking from a different angle. The plants are able to occupy very low light areas not suitable for other species.

Imagine you see an eerie glow coming from the ground, you pick it up, and all you appear to have in your hand is some crumbled soil (**8**). Male plants have narrow lanceolate leaves that usually have two antheridia. On female plants, they will have a single archegonium that will develop from a rosette of lanceolate leaves. The capsules mature in late spring to early summer, but in some cases the operculum may fall before the seta elongates. The capsules are ovoid, ornamented and are sticky. Because they are sticky it appears that they may be dispersed by insects (**9**).



A cave cricket In the *Schistostega*. **Photo by Shaun Pogacnick**

Bob and I made another trip on November 25, 2018 to study some of the associated species. Associated species are a good indicator for other possible locations where the species may occur. The moss that seemed to be most prevalent was *Pseudotaxiphyllum distichaceum* (Mitten) Z. Iwatsuki, which was found growing right next to the *Schistostega*. A few other mosses Included *Fissidens elegans* Bridel, *Diphyscium foliosum* (Hedwig) D. Mohr,

and *Rhabdoweisia crispata* (Dickson ex Withering) Lindberg. There was also one species of liverwort, *Diplophyllum apiculatum* (A. Evans) Stephani. If you know of any places these mosses occur, you may want to keep your eye out. You never know when you may strike Goblin Gold!

Thompson ledges has much more to offer than just the Goblin Gold. I enjoy going for its great lichen diversity. I tend to favor the lichens more but this moss made me think otherwise! The tops of ledges are dry with lots of chestnut oaks (*Quercus montana*) and some open sandstone ledges. The top of the ledges is unbelievable for lichens. (A personal shout out to Tomás Curtis for showing me some of his great lichen finds there!)

The best spot is south of the parking lot no farther than 500 feet, just east of the tennis court. The ground is carpeted with Pincushion Moss (*Leucobryum glaucum*) with patchy openings of sandstone which have a rare crustose lichen known as Map Lichen (*Rhizocarpon rubescens*). While looking around this opening you can also find what looks like a light green dust covering the ground; this is the thallus of Pink Earth Lichen (*Dibaeis baeomyces*). Take a closer look and you can find small pink podetia structures. There are a few *Cladonia* species in this area. One to keep an eye out for is the Thorn Cladonia (*C. uncialis*). This lichen is more of a southeastern Ohio species where it grows like a weed on some of the Hocking Hills overlooks. Right over the edge of the cliff is a population of Rock Ramalina (*Ramalina intermedia*), an Ohio endangered species. It can be found on a small ledge by a small hemlock growing on the steep face of the cliff. If you're lucky enough you can find small pieces that have fallen to the bottom of the cliff to get a close look.

Some of the chestnut oaks have some lichens that are rare locally. One is the Yellow Ribbon Lichen (*Usnocetraria oakesiana*), a green foliose lichen with soridiate edges. Another lichen growing on some of the oaks is Hooded Tube Lichen (*Hypogymnia physodes*). This is a neat lichen which becomes much more frequent in Pennsylvania. A couple others to mention that grow alongside the hooded tube lichens are the Salted Sunburst Lichen (*Imshaugia aleurites*) and Crumpled Rag Lichen (*Platismatia tuckermanii*). Both these lichens I find frequently in southeastern Ohio on Virginia pines (*Pinus virginiana*).

Last but not least, another new discovery I stumbled across March 29, 2018 is the Sand Loving Iceland Lichen (*Cetraria arenaria*) pictured below.

Cetraria arenaria, Thompson Ledges. **Photo by Shaun Pogacnick**

This lichen had not been seen in Ohio since prior to the 1960's and was previously found in Cuyahoga and Lorain Counties. It can be

found growing among the carpets of the *Leucobryum* and *Hypnum* moss around the pavilion and building. If you plan to visit the park it is approximately a couple hundred yards east of Thompson Square and is on Thompson Road. The park is public and is open from dawn till dusk.

Has the Goblin Gold moss been at this spot since it was last recorded in 1893? I would like to believe it's been there all these years. The *Schistostega* can be hard to spot and the glowing protonema appear to die back in the winter making it nearly impossible to spot, as we noticed on our trip there in November. The moss also could have had an especially good year spreading out making it much easier to spot. There really is no way to truly tell, but it is great to know it still occurs in Ohio. **-Shaun Pogacick**

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A forest with many lichens is a happy forest. **– James Lendemer**

"How to use a hand lens"

Source: Robertson, K.R. 1980.
Observing, Photographing, and Collecting Plants.
Illinois Natural History Survey Circular 55
(Drawing by Survey Illustrator Lloyd LeMere)

THE 2018 SUMMER FORAY TO WAYNE COUNTY, OHIO

The 2018 Summer Foray was held on June 9 at two locations in Wayne County in north-central Ohio. Wayne County is within the glaciated region of the state with primarily Mississippian shale and sandstone bedrock.

Located in Shreve, Millbrook Fen is a rare fen of the fast-disappearing graminoid type that is characterized by grassy vegetation. It is part of 15 acres of land owned by the Western Reserve Land Conservancy. This land is notable as a Rare Ohio Biological Community, with a range of habitats including the fen as well as marshland, wetlands, a wet sedge meadow, woodland, stream channels, and the old Kister Mill built in 1816.

Located in Wooster, Wooster Memorial Park is a 422-acre woodland park with hemlock groves and Rathburn Run Creek that cuts through sandstone cliffs.

Prior to the foray, a total of 133 bryophytes (68 mosses and 65 lichens) were reported in Wayne County. Updated records will now include 7 new lichens and 14 new mosses collected in the county (designated by **N** in the tables below). One lichen, *Melanelixia glabratula,* is a new state record.

Lichens and related fungi recorded during the foray included: 28 macrolichens, 34 crustose lichens, 3 allied fungi and 1 lichenicolous fungus. Of the macrolichens, 6 were new for Wayne County and 1 was reported for the first time in Ohio. *Melanelixia glabratula*, new for Ohio, was collected by Tomás Curtis at Kister Mill and will be described in greater detail in another article in this issue of OBELISK.

2018 OMLA Summer Foray: Lichenized, Lichenicolous, and Allied Fungi of Wayne County, Ohio (6/9/2018)
N = New macrolichen for Wayne County
NS = New macrolichen for Ohio
* = "allied fungus"
** = lichenicolous fungus

Amandinea polyspora
Amandinea punctata
*Amphisphaeria bufonia**
Anisomeridium polypori
Arthonia apatetica
Arthonia helvola
Bacidina delicata
Biatora printzenii
Calicium tigillare
Caloplaca microphyllina
Candelaria concolor
Candelariella aurella
Candelariella efflorescens
Canoparmelia texana - **N**
Chrysothrix caesia
Circinaria caesioncinerea
Cladonia coniocraea
Cladonia cristatella
Cladonia cylindrica
Crespoa crozalsiana
Dictyocatenulata alba
Evernia mesomorpha - **N**
Flavoparmelia caperata
Flavoplaca citrina
Flavopunctelia soredica
Graphis scripta
Hyperphyscia adglutinata
Lecania croatica
Lecanora layana
Lecanora saligna
Lecanora strobilina
Lecanora symmicta

Lecanora thysanophora
Lecanora sp. (undescribed)
Lecidea varians
Lepraria caesiella
Lepraria finkii
Lepraria hodkinsoniana
*Marchandiomyces corallinus***
Melanelixia glabratula **- NS**
Melanelixia subaurifera
Micarea peliocarpa
Myelochroa aurulenta
Ochrolechia arborea
Parmelia sulcata
Parmotrema hypotropum
Parmotrema reticulatum
*Phaeocalicium polyporaeum**
Phaeophyscia pusilloides **- N**
Phaeophyscia rubropulchra
Physcia americana
Physcia millegrana
Physcia stellaris
Physciella chloantha **- N**
Physconia leucoleiptes
Punctelia caseana **- N**
Punctelia rudecta
Pyxine subcinerea
*Sarea resinae**
Segestria lectissima
Trapelia glebulosa
Trapeliopsis flexuosa
Usnea hirta **- N**
Viridothelium virens
Xanthocarpia feracissima
Xanthomendoza weberi

2018 OMLA Summer Foray: Mosses of Wayne County, Ohio (6/9/2018)
N = New moss for Wayne County

Amblystegium varium
Anomodon attenuatus
Atrichum angustatum
Brachythecium acuminatum
Brachythecium falcatum - **N**
Bracythecium laetum
Brachythecium plumosum
Bryhnia novae-angliae
Bryum caespiticium - **N**
Bryum lisae var. *cuspidatum* - **N**
Bryum pseudotriquetrum - **N**
Calliergonella cuspidata - **N**
Calliergonella lindbergii
Dicranum montanum
Drepanocladus aduncus
Euryhnchium pulchellum - **N**
Helodium blandowii - **N**
Hypnum curvifolium - **N**
Leskea gracilescens
Orthotrichum anomalum - **N**
Orthotrichum ohioense - **N**
Plagiomnium cuspidatum
Plagiothecium cavifolium
Platygyrium repens
Polytrichastrum ohioense - **N**
Pylaisiadelpha tenurostris - **N**
Rhizomnium punctatum
Rhynchostegium serrulatum
Sematophyllum adnatum - **N**
Taxiphyllum deplanatum - **N**
Thuidium delicatulum

2018 OMLA Summer Foray: Liverworts of Wayne County, Ohio (6/9/2018)

Frullania eboracensis

- Julia Wiesenberg

ELEGANT SUNBURST LICHEN

One of my goals during a recent visit to the Bruce Peninsula in Ontario was to locate and photograph Elegant Sunburst Lichen, *Xanthoria elegans*, one of North America's most spectacular lichens. There are a couple of old Ohio records of this lichen from the Lake Erie

Islands in northwest Ohio and some very recent sightings elsewhere along the coast, but I failed to find it along the rocky north shore of Kelley's Island during a visit in July, 2017. Elegant Sunburst Lichen is fairly common along the rugged coastlines of the Great Lakes farther north, and I saw numerous examples during a boat cruise from Tobermory, at the tip of the Bruce Peninsula, to Fathom Five National Marine Park, where Lake Huron meets Georgian Bay.

Although I saw extensive displays of Elegant Sunburst Lichen along remote stretches of cliffs on several of the 19 islands in Fathom Five National Marine Park, it was mostly absent from the rocks in areas visited by tourists, such as the Flowerpots on the coast of Flowerpot Island. Popular places like Flowerpot Island and the Grotto in Bruce Peninsula National Park are visited by several hundred thousand people each year, mostly during the summer, and the collective impact of thousands of pairs of feet on the rocks where the lichens grow eventually destroys the lichens. Surprisingly, I found the best places to study and photograph Elegant Sunburst Lichen were *inland*, on large boulders in pastures grazed by beef and dairy cattle.

Elegant Sunburst Lichen thrives on rock that receives a generous supply of nitrogen from bird droppings and other sources. On cattle farms, the fields are regularly fertilized by manure produced by the cattle and spread using a manure spreader, which sprays the manure as the spreader is hauled by a tractor or - in Ohio's Amish country - by a team of Belgian Shire horses or mules. The manure is semi-liquid when it is spread, and it's a safe bet that some of the large boulders in the pastures of Bruce County cattle farms receive a healthy coating of nitrogen-rich liquid manure in early spring, much to the delight of the resident Elegant Sunburst Lichens.

Elegant Sunburst Lichens on rocks in cattle pasture near Crane Lake. **Photo by Ian Adams**

A close-up view of a rosette of Elegant Sunburst Lichen shows it to be a thing of beauty, and elegant indeed. Thin, deep orange lobes of the thallus, which is white underneath, radiate out in a zigzag pattern. The many small, circular orange structures are spore-bearing apothecia, which are the primary means of reproduction in this species of foliose lichen. Elegant Sunburst Lichen has been used in *lichenometry* to estimate the age of rocks. After an initial two or three decades during which the lichen becomes established on the rock surface, the thallus of Elegant Sunburst Lichen grows at a rate of only 0.5 mm per year, so the lichens shown in the attached photographs may be hundreds of years old.

Elegant Sunburst Lichens with apothecia. **Photo by Ian Adams**

In the Arctic, Inuit hunters have used the presence of Elegant Sunburst Lichen to help locate the burrows of hoary marmots. Sadly, this vivid lichen has also been used by poachers to pinpoint the nests of Peregrine Falcons on cliff faces.

Elegant Sunburst Lichen has been found on every continent except Australia, and grows at altitudes up to 24,000 feet in the Himalayan Mountains, where the climatic extremes inhibit the growth of virtually all other forms of life. Elegant Sunburst Lichen has also survived an 18-month exposure to solar UV radiation, cosmic rays, vacuum and varying temperatures, similar to conditions on the surface of Mars, in an experiment performed by the European Space Agency on the outside of the International Space Station in 2013 to 2014.

Jesus may not have had lichens in mind when he stated, in the Sermon on the Mount (Matthew 5:5), "Blessed are the meek: for they shall inherit the earth." But in a post-apocalyptic world, as the remnants of the human race struggle to survive, I have a strong feeling that *Xanthoria elegans* and other tough lichens would be doing just fine.

- Ian Adams

GETTING STARTED WITH *SPHAGNUM*

For a state that's neither far north nor very boggy, Ohio is surprisingly rich in *Sphagnum* peat mosses, with 25 species on the OMLA moss atlas. Thus, a working knowledge of them is an essential part of a bryologist's toolkit.

This genus has a well-deserved reputation for being a challenge to identify, so when I saw that Eagle Hill Institute in Maine was offering a week-long summer seminar in 2018, I just had to go. It was taught by Duke University's Jon Shaw with able assistance from graduate student Karn Imwattana. We visited bogs and fens and had a great time.

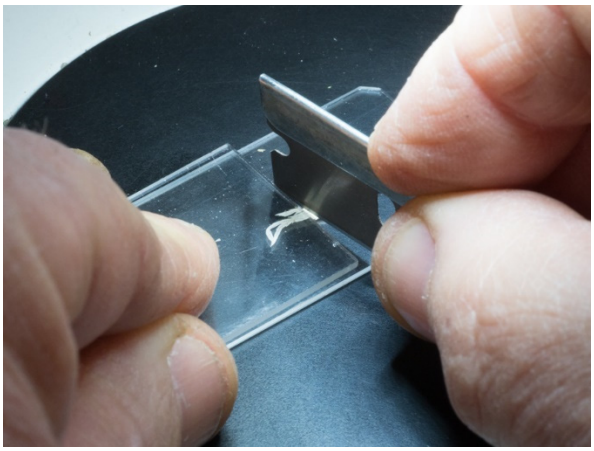
All photos in this article by Bob Klips

All aspects of the Eagle Hill experience were great, but there's one thing that, all by itself, made the expense and long drive worth it: learning how to make moss leaf cross-sections!

Making leaf cross-sections

Note: Cross-sectioning leaves isn't just a *Sphagnum* thing. Thin slices are essential for telling apart the various *Atrichum* species that have been annoyingly segregated from the formerly sensibly interpreted *Atrichum undulatum* for distinguishing genera within the Pottiaceae based on their characteristic numbers (either one or two) of "stereid bands" and for trying to tell apart (the operative word here is "trying") the two Ohio species of pincushion moss (genus *Leucobryum*). I've heard bryologists, including some of the best experts in the world, cheerfully claim that all they need do is haphazardly chop and cut the wee little leaves laying on a microscope side, and after a sufficiently great number of cuts, searching through the leafy debris will turn up one or two usable useful cross sections. Humbug! That doesn't work. All you get is a moss version of chopped spinach. Moss salad. Mossbbouleh. Mossfetti.

In the identification of *Sphagnum*, the microscopic examination of thin cross-sections of leaf tissue is necessary to discern the shapes of the green cells and their precise orientation with respect to the much larger empty hyaline ones.



Procedure: Place a few damp but not wet branches on a microscope slide with their bases pointed towards where the cutting will take place. Lay another slide on top, leaving a fraction of a millimeter uncovered and thus cuttable. Press down gently on that top slide to stabilize the branch and allow the vertical wall of the top slide to form a neat cutting guide. Placing the blade against the slide-wall guide, angle it such that the cutting edge is positioned several slices-to-be away from the top slide. Make 4 slices, reducing the angle after each cut until the final cut is made flush with the bottom edge of the top slide. Finally, press firmly down on the top slide to compress the branches further, squeezing a precious additional few micrometers of leaf and make one more slice identical to the last. Repeat the entire process a few times after moving the top slide back a bit to expose another tiny length of branch-bundles. If all goes well, there will be a pile of beautiful thin crescents of moss leaf stuck onto the razor blade like drifted snow after plows come through. Remove the top slide, tweeze away any large stem fragments, and disperse the slices into a drop of water. Cap it off with a cover slip and admire your craftsmanship!

The architecture of a *Sphagnum* plant

Sphagnum gametophyte plants consist of upright stems bearing clusters of leafy branches along most of their length, topped by a pompom-like capitulum made up of a much denser aggregation of the clusters of branches. *Sphagnum* produces sporophytes that are structurally simpler than those of typical mosses, composed only of a globose sporangium lacking a peristome, elevated a short distance above the leafy gametophyte not by a sporophytic setae, but instead by a

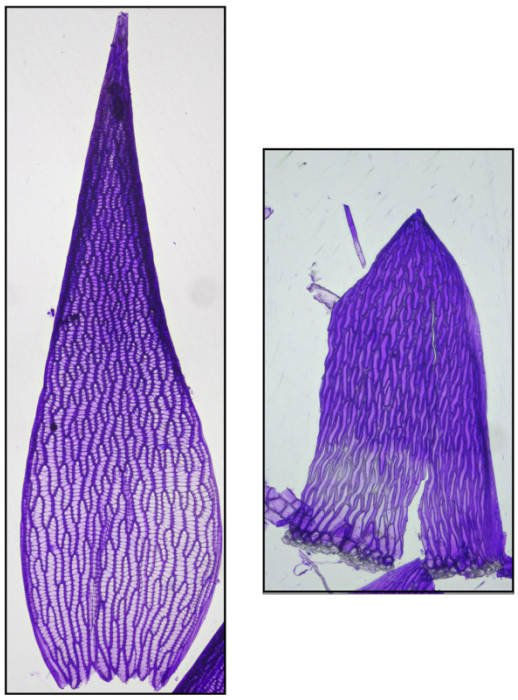
"pseudopodium" composed solely of gametophyte tissue.

A typical gametophyte of *Sphagnum*

The sporophytes of different *Sphagnum* mosses are basically identical, and so are of no use in identification.

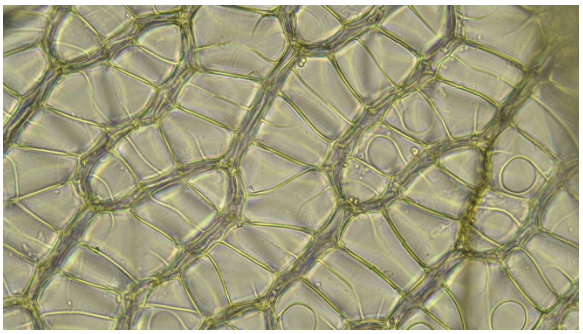
Sphagnum riparium with sporophytes at a bog in Alberta, Canada.

Both the stems and the branches of *Sphagnum* are leafy, but in different ways. The branches are densely populated with overlapping leaves that are ovate-lanceolate, acute and concave. The stem leaves, however, are sparse, parallel-sided, more abruptly tapered to the tip and generally lay flat against the stem. The photo below shows both types of leaves of *Sphagnum fallax*, stained with Gentian Violet. (Staining helps to see pores in cells, necessary for distinguishing some species.)



Perhaps the most striking aspect of a *Sphagnum* moss is its amazing dimorphic leaf cells. In typical moss fashion the leaves are one cell thick, but *Sphagnum* leaves are uniquely constituted, with narrow green photosynthesizing cells arranged into a mesh-like network surrounding large dead empty cells having holes in their walls to admit water. That configuration helps explain why *Sphagnum* mats are so bulky, achieving spatial dominance in nutrient-poor habitats where resources to construct

biomass are so limited. Most of a peat moss's body is basically tiny water balloons, providing structural heft with very little costly-to-produce biomass.



Sphagnum leaf cells.

Identifying a few *Sphagnum* mosses

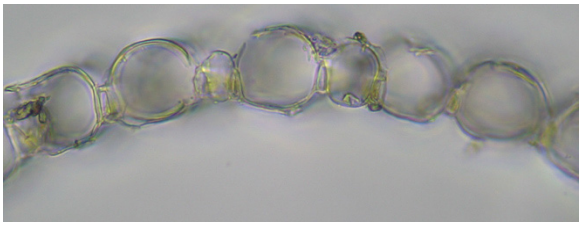
A few weeks ago, Ohio Natural Areas and Preserves Association ("ONAPA"), an enthusiastic volunteer stewardship group, spent a day at Karlo fen, along the shore of Nimisilia Reservoir at Portage Lakes State Park in Summit County (northeastern Ohio).

ONAPA at Karlo Fen

During a few breaks from cutting glossy buckthorn (boo, hiss!) and a few other shrubs that threatened to shade out the fen plants, I poked around looking for as many seemingly different peat mosses as I could find, to try out my newly-acquired ID skills. Here are the ones I found and why I think they are what I think they are. My go-to book for identification is Bruce Allen's *Mosses of Maine Sphagnaceae-Timmiaceae*, containing an excellent illustrated treatment by Lewis E. Anderson.

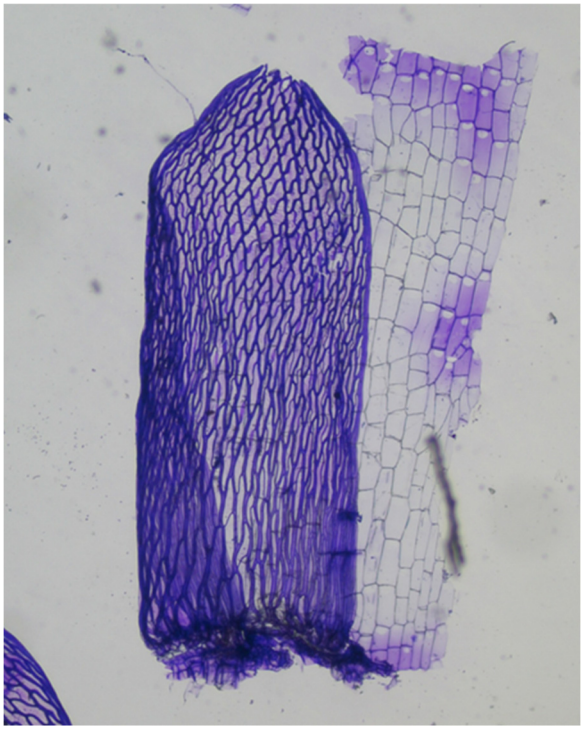
This moss was especially pretty, looking rather stringy, with capitula red enough for even a somewhat color-blind botanist to notice. (It is also pictured above as the example of *Sphagnum* moss architecture.)

Back in the lab, it became evident that this is a member of the section Acutifolia, a somewhat difficult group (some species are rather similar to one another) that is well represented in Ohio. (Eight of the 25 Ohio *Sphagnum* species are in this section, comprising the most well-represented of our 6 traditionally recognized sections). Acutifolia is distinguished in part by its branch leaves wherein, as seen in the cross-section below, the small green cells are triangular and exposed more broadly on the inner (convex) surface of the leaf.



The Acutifolia portion of the key directs our attention to the shape of the stem leaves and the porosity (or lack thereof) of the stem cortical cells. To discern these features, I finally splurged and bought the long sought-after $38 Dumont Swiss #3 gourmet forceps.

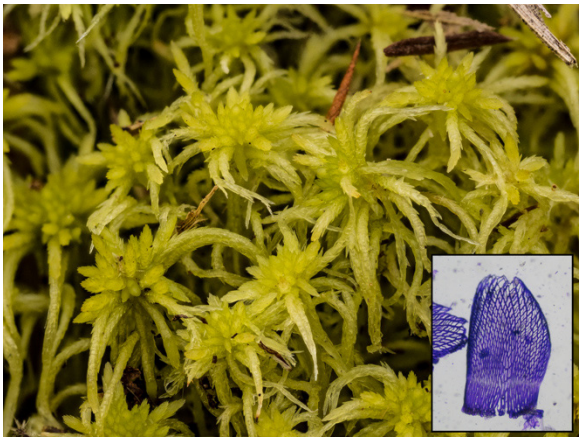
The fine tips helped me pluck the branches off a couple centimeters of the mid-portion of the stem, which was then dipped in the Gentian Violet. After rinsing the stem in water, using a razor I scraped the now-purple leaves onto a drop of water on a slide.



The stem scraping was done aggressively so as to shave off a portion of the cortex (outer cell layer). Notice in the image below that the stem leaves are more or less straight-sided and somewhat erose at the apex and the stem cortical cells are porose. (Note: according to Anderson, this species often has "a pinkish tinge." These seem to me to be considerably more bright red than just "pinkish," so maybe I made wrong turn somewhere, but the porosity of the stem cortex cells seems definitive.)

For two of our members of section Acutifolia –*Sphagnum girgensohnii* and *S. fimbriatum* --a key feature is having stem leaves that are broadly lacerate-fringed across the top, with a conspicuous triangle of enlarged thick-walled cells at the center of their bases. The difference between them is the degree to which the leaves are fringed.

This one, because the stem leaves (inset) are fringed only across the moderately expanded apex, I'm thinking is *S. girgensohnii*. A few people at the workshop in Maine mentioned a nifty field test for *girgensohnii*. Apparently, its stem is stiff, snapping neatly when bent like a piece of chalk.

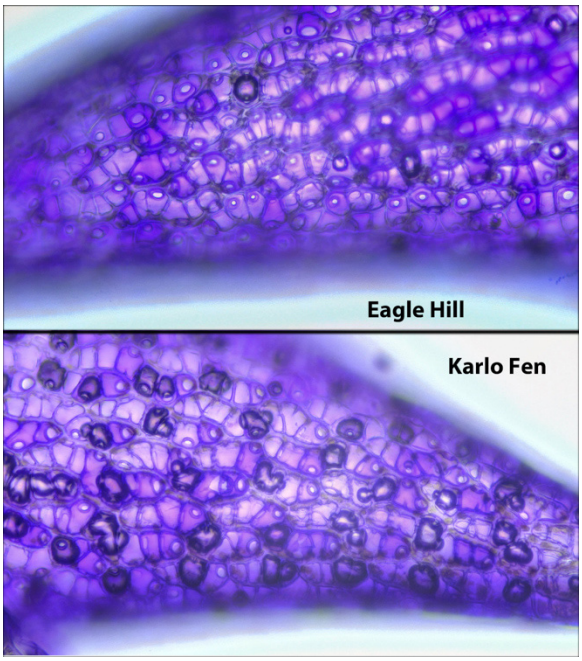


Another specimen has stem leaves that look like they've seen a ghost, so they must belong to *S. fibriatum*.

The Gentian Violet staining procedure really shines when trying to differentiate an unusual fen species of *Sphagnum* that's not very common in Ohio (known from only three counties), *S. warnstorfii*. By virtue of its stem leaves being more or less straight-sided, combined with a stem cortex that's aporose (lacking pores), it appeared that this member of the Acutifolia is either that fen-tastic species or *S. fuscum* or *S. rubellum*, which also have flat stem leaves. We're told to look at the apical branch-leaf hyaline cells, to see if they have tiny strongly ringed pores on the outer (concave) surface.

Words like "tiny" and "ringed" aren't helpful if you don't have a clear idea of what "not tiny" and "not ringed" might look like. Thankfully, another unexpected benefit of the workshop came on the last day, when Jon and Karn asked whether anybody would like to take home the demo specimens we accumulated during the week. "Ooh ooh, me me!" Look at the lovely mossgasboard!

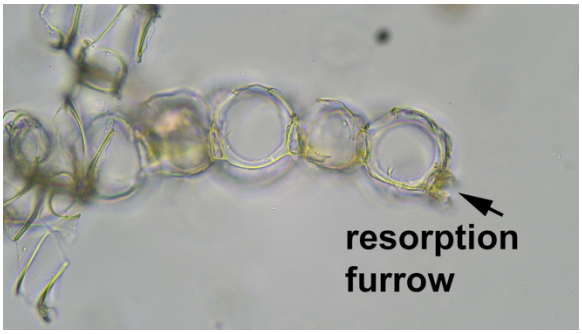
A comparison of my putative *S. warnstorfii* with the real thing seems favorable. The pores are about equally small and ringed in both samples. (Note: seeing features on the outer surface of a leaf requires a leaf to lay with the outer surface face up when the coverslip is placed in the slide. You'd think that with, say, a dozen leaves on a slide that a good number of them would by chance be oriented that way. Think again. They apparently float like little boats, curved side down. It's annoying.)



The 2nd most well-represented *Sphagnum* section in Ohio, with 6 species, is Cuspidata. Here, the branch-leaf green cells in cross-section are more broadly exposed on the outer surface. One of the major diagnostic traits in this section has to do with the young buds of the downward-pointing (pendant) branches in the lower part of the capitulum, i.e., are they single (one atop another) or paired (side-by-side)? This moderate-sized species with paired buds neatly fits the description for *S. fallax*, although it should be noted that "*fallax"* means "fooler," so

maybe this is something else. A sequoia tree perhaps? Blue whale?

One of the weirder steps in the *Sphagnum* keys is when they talk about a "resorption furrow." This is a phenomenon in leaf development, found in certain groups only and therefore useful to identify them, wherein the cell walls along the margins of branch leaves are partly digested away after they form, leaving a "C" shaped outline when viewed in cross-section. Below, see a cross-section of a member of the section *Sphagnum*, the more well represented (with 4 species) of the two sections that include species in Ohio that have a resorption furrow (the other being section Rigida, with *Sphagnum compactum* as our sole representative).



If the prospect of doing painstaking leaf sectioning just to see a miniscule feature like a resorption furrow seems daunting, don't despair, because members of the section Sphagnum are distinctive macroscopically as well. Their stem leaves are deeply concave with a cucullate (hooded like a sweatshirt) leaf tip. Overall, they look puffy! Pleasantly plump *Sphagnum palustre* is our most common peat moss, known from 34 counties.

As is frequently the case in bryology, many of the features are best understood through experience rather than just seeing descriptions in book. Therefore, these identifications might not all be correct.

Attending a great summer workshop at a terrific institution was helpful but by no means necessary to gain the ability to dissect a peat moss and see its diagnostic parts. I encourage all moss-loving OMLA members (bryophiles?) to give *Sphagnum* hunting a try. **- Bob Klips**

2018 ADDITIONS TO THE BRYOPHYTES OF MORGAN COUNTY, OHIO

In the last issue of the Obelisk (OBELISK Volume 14 [2017], page 43), we reported on the results of the Morgan County foray – held in the fall of 2017. The results showed an increase from 37 species to 83 species of

mosses and a pickup from 0 to 9 species of liverworts. (Note: last year's report said 84 species but one species was counted twice under different names.)

Since then there has been further exploration of Burr Oak State Park in Morgan County, where the bulk of last year's foray was held. There was a wooded ravine along the backpacking trail that was examined during the foray. However collecting time was limited due to the site being a considerable distance from the trailhead.

We, along with Barb Andreas, re-visited the site in March of this year. We sampled a small, moist NE-facing sandstone cove, a narrow arm of the ravine, and a WSW facing slope with sandstone rock wall and scattered boulders.

In these areas were found 33 species of mosses, of which 15 were new county records; and 7 species of liverworts, of which 4 were new county records. This gives a total of 98 mosses and 13 liverworts for the county.

From our experience at the foray and at the last site, we think there are still numerous species yet to be discovered in the Burr Oak area. Our own experience with collecting bryophytes is there is considerable diversity, and more collecting time will yield more new species for Morgan County.

The updated county list of bryophyte species is shown below. New records have "**N**" beside them. Records from the foray last year have "'17" beside them. Un-notated records were collected in 2017 but on the county list already before the 2017 foray. The prior list of lichen species has not changed.

Liverworts

Conocephalum salebrosum '17
Frullania eboracensis '17
Frullania inflata '17
Geocaylx graveolens '17
Jamesoniella autumnalis N
Lophocolea heterophylla '17
Metzgeria furcata '17
Nowellia curvifolia '17
Pellia epiphylla **N**
Porella platyphylloidea '17
Radula complanata **N**
Scapania nemorea '17
Trichocolea tomentella **N**

Mosses

Amblystegium varium
Anomodon attenuatus
Anomodon minor '17
Anomodon rostratus '17
Atrichum angustatum
Atrichum crispulum '17
Aulacomnium heterostichum '17
Barbula unguiculata '17
Bartramia pomiformis '17
Brachythecium acuminatum '17
Brachythecium campestre '17
Brachythecium falcatum **N**
Brachythecium laetum
Brachythecium plumosum
Brachythecium rivulare **N**
Brachythecium rutabulum
Brhynia gramicolor ***N***
Bryhnia novae-angliae '17
Bryoandersonia illecebra
Bryum argenteum
Bryum flaccidum '17
Callicladium haldanianum '17
Calliergonella curvifolium '17
Calliergonella lindbergii '17
Ctenidium molluscum '17
Cyrto-hypnum minutulum ***N***
Cyrto-hypnum pygmaeum '17

Dicranella heteromalla '17
Dicranodontium denudatum '17
Dicranum flagellare '17
Dicranum fulvum ***N***
Dicranum montanum '17
Dicranum scoparium
Didymodon ferrugineus '17
Didymodon rigidulus ***N***
Entodon seductrix
Eurhynchium hians '17
Eurhynchium pulchellum '17
Eurhynchium riparioides '17
Fabronia ciliaris '17
Fissidens dubius '17
Fissidens bryoides N
Fissidens bushii ***N***
Fissidens osmundioides '17
Fissidens taxifolius '17
Haplocladium virginianum '17
Haplohymenium triste '17
Homalotheciella subcapillata '17
Homomallium adnatum
Hygroamblystegium tenax '17
Hyophila involuta '17
Hypnum curvifolium '17
Hypnum imponens
Hypnum pallescens '17
Isopterygiopsis muelleriana ***N***
Isopterygiopsis pulchella '17
Leskea gracilescens '17
Mnium ambiguum ***N***
Mnium marginatum ***N***
Orthotrichum pusillum '17
Orthotrichum stellatum
Plagiomnium cuspidatum
Plagiomnium ellipticum '17
Plagiothecium cavifolium ***N***
Platygyrium repens '17
Pogonatum pensilvanicum '17
Polytrichum ohioense
Pyaisiadelpha tenuirostris '17
Rhizomnium punctatum
Rhynostegium serrulatum '17
Schistidium apocarpum '17
Sematophyllum adnatum '17
Sematophyllum demissum '17
Taxiphyllum taxirameum '17
Tetraphis pellucida ***N***
Thamnobryum alleghaniense ***N***
Thuidium delicatulum
Ulota crispula '17)

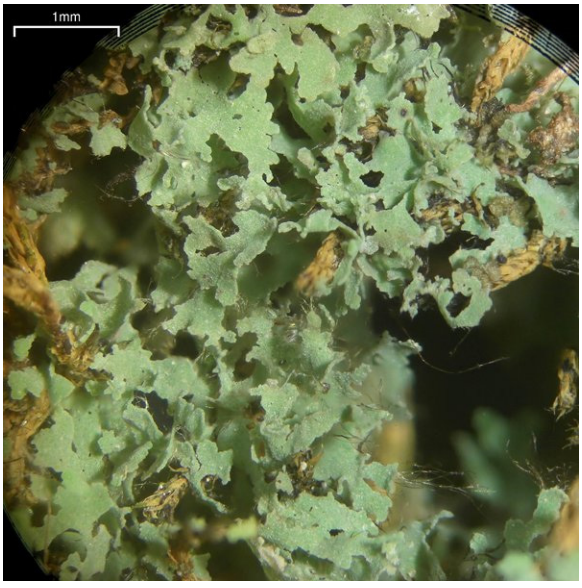
- Bill and Carole Schumacher

THREE WEIRD LICHENS

Lichens are everywhere
- James Lendemer

Yes, lichens are everywhere, sometimes in places that you don't expect them, and sometimes in forms that don't appear to be lichens. Following are three strange lichens that are known from Ohio, and that might be found when exploring for bryophytes.

Flakea papillata is a minute, squamulose lichen that was only fairly recently described (1992). It grows on shaded sandstone in sheltered locations, sometimes on bare rock and sometimes among mosses. The squamules are dissected and tattered, only 1 to 2 mm long. *Flakea* is bright green when wet and gray-green when dry.



Flakea papillata. **Photo by Jason Hollinger**

In the US, *Flakea papillata* is known from a number of eastern states. Ohio has only two confirmed records, Gallia and Hocking Counties, but it should be present in other southeastern counties with sandstone outcrops. A good place to see it is Ash Cave State Park where it forms green patches at the back of the overhang.

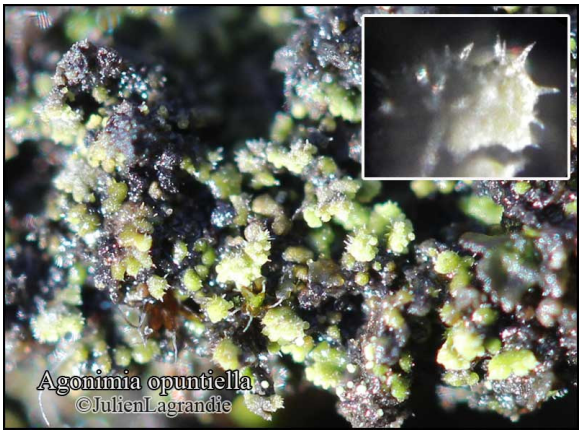
Another weird lichen of the same habitat is *Cystocoleus ebeneus*. This is a micro-fruticose lichen which appears as a black, felty mass on moist sandstone or more rarely bark. The fruticose structure is formed by the filamentous green algal photobiont *Trentepohlia*, completely encased by the dark pigmented fungal hyphae. This species looks like some kind of mold rather than a lichen.

Cystocoleus ebeneus. **Photo by A. J. Silverside**

Primarily north and west in the US, it is known from Fairfield, Hocking and Jackson Counties, but is probably present in other areas with sandstone outcrops. *Cystocoleus* can also be seen at Ash Cave.

The third strange lichen is the micro-squamulose *Agonimia opuntiella*. This tiny lichen grows on sandy soil or among soil mosses, and appears as a miniature cactus (*Opuntia* is the genus of Prickly Pear cactus). The loosely attached squamules form distinctive segmented, bud-like propagules with clear hyphal hairs resembling cactus spines.

It has been found at scattered, dry locations across the US. The only Ohio record is from Scioto County, where it was found in 2006 during the joint Crum-Tuckerman Foray.



Agonimia opuntiella. **Photo by Julien Lagrandie**

This tiny lichen can only be seen with a hand lens or dissecting scope. Look for it by examining bare, sandy soil or soil mosses. Another record for Ohio would be a great find! **- Ray Showman**

A NEW DR. SEUSS AT THE EDGE?

I'd like to share some photos of the *Cladonia* lichens. These odd-shaped lichens are unique and interesting. Since they look like Dr. Seuss images, you might as well read about them in Dr. Seuss form!

A peculiar lichen with
the genus *Cladonia,*

I'm sure you've seen 'em, if I
knew you, I'da shown ya!

Cladonia pyxidata complex. **Photo by Robyn Wright-Strauss.**

Some are statuesque, with stalks slender and tall,

Cladonia lichens generally grow with squamules below, and usually form stalks (podetia) that stick up into odd shapes. .**Photo by Mark Zloba.**

British soldiers, *Cladonia cristatella.* . **Photo by Mark Zloba.**

Some are short, with no stalks at all.

Yellow-tongued Cladonia, *Cladonia robinsii.* **Photo by Mark Zloba.**

They sometimes look like tiny cities under seas,

Some old logs are covered with *Cladonias* of many species. **Photo by Robyn Wright-Strauss.**

And sometimes look like an army of fuzzy golf tees.

Pixie cups, *Cladonia pyxidata.* **Photo by Mark Zloba.**

One looks like a trumpet, inside a trumpet, inside a trumpet,

Ladder lichen, *Cladonia verticillata.* **Photo by Mark Zloba.**

Another like a floor covered in toast, cracker, or crumpet! (Lame line, I know, but I just couldn't dump it.)

Stalkless cladonia, *Cladonia apodocarpa.* **Photo by Mark Zloba.**

Ladder lichen, *Cladonia verticillata.* **Photo by Mark Zloba.**

One is so tangled a beetle couldn't get through,

Dixie reindeer lichen, *Cladonia subtenuis*. **Photo by Mark Zloba.**

Another so open it couldn't block the wind if it blew.

Common powderhorn, *Cladonia coniocraea.* **Photo by Mark Zloba.**

Most grow in the woods and very few are urban,
Even though some are fashionable with berets or a turban.

Southern soldiers, *Cladonia didyma.* **Photo by Mark Zloba.**

Turban lichen, *Cladonia peziziformis.* **Photo by Robyn Wright-Strauss.**

Search the ground next time you're in a forest full of trees,you should find Cladonias if you get down on your hands and knees.

Fence-rail Cladonia, *Cladonia parasitica.* Some lichens need chemical tests to determine ID. **Photo by Robyn Wright-Strauss.**

These small fungi are harmless, they won't bite, sting or poke us.

By the way, thanks to Robyn for some pics I couldn't get in focus!

- Mark Zloba

THE HISTORY OF LICHENOLOGY IN OHIO

The knowledge of Ohio lichens began with a man named Thomas Lea, who resided in the Cincinnati area. Lea was interested in all things botanical and in addition to vascular plants, collected lichens in the Hamilton County area from around 1836 to 1844. His collection of 56 species included many lichens that are now rare, including *Lasallia pensylvanica* (**WANTED (ALIVE)!** *LASALLIA PENSYLVANICA*. OBELISK 2013, p.11), *Umbilicaria muehlenbergii*, *Pseudocyphellaria aurata* (**WANTED (ALIVE)!** SPECKLEBELLY LICHEN. OBELISK 2012, p.4) and *Usnea longissima*. Label information was vague on many of his specimens and these four lichens have not been found again in Ohio and are now presumed extirpated.

His most noteworthy collection was of a small, gray foliose lichen from the Hamilton County Ohio River floodplain. This lichen, later named *Phaeophyscia leana*, grows on periodically flooded trees, below the high water mark where no other lichens are found. It was known only from the type location which was later destroyed. For over a century *Phaeophyscia leana* was thought to be extinct. However, in the 1980's it was found again at several locations along the Ohio River in Illinois and Kentucky. It was also discovered at several locations in Adams County, Ohio, where there are healthy populations in the Edge of Appalachia nature preserves.

There were a number of small lichen collections made during the late 1800's and early 1900's but the next milestone in Ohio lichenology was probably the work of Dr. Bruce Fink. He and his students at Miami University collected lichens in southwestern Ohio during early 1900's. Fink later moved to the University of Michigan and published the authoritative work, The Lichen Flora of the United States (Fink, 1935). This book contains keys and descriptions of 1,578 taxa.

During the 1930's, Dr. John Wolfe at The Ohio State University collected lichens in the south-central Ohio counties. He also examined Ohio specimens from other herbaria and eventually published A Catalog of the Lichens of Ohio (Wolfe, 1940). This publication, the first comprehensive listing of Ohio lichens, contained 331 taxa, with keys and county records from 67 of Ohio's 88 counties.

The next milestone was the work of Conan J. Taylor, O.F.M. Father Taylor was a teacher at Bishop Luers High School in Fort Wayne, Indiana. He had a longstanding interest in lichens and collected in Ohio starting around 1954. During the summers of 1959, 1961 and 1962 he collected several sites from every county in Ohio. This was the first systematic collection of the entire state.

Taylor began the final identifications and compilations of the state lichen flora in 1964. His efforts ended with the publication of The Lichens of Ohio (Figure 1), Part 1 Foliose Lichens (Taylor, 1967) and Part 2 Fruticose and Cladoniform Lichens (Taylor, 1968). This was a state-of-the-art work with very workable keys, detailed descriptions and photographs of each of the 178 foliose and fruticose lichens known from Ohio at that time. His books also included instructions for identifying lichen acids using micro-recrystalization, as well as a very complete pictorial glossary.

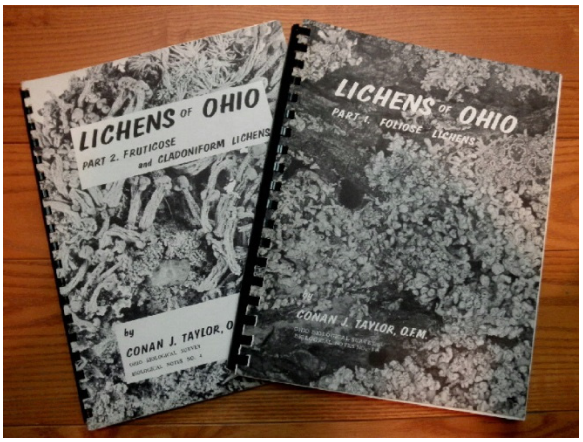


Figure 1. Conan Taylor's Lichens of Ohio.
Photo by Ray Showman.

I have a special affinity for Taylor's books because they were almost brand new when I began studying lichens in 1969. I learned lichen identification from them and used them for a number of years until the taxonomy and nomenclature became outdated.

I was lucky enough to get a job working with lichens and for the next several decades I used lichens as indicators of air quality around coal-burning power plants in the Ohio Valley region (but that is another story). During that time, I also surveyed lichens in a number of Ohio state parks, state forests and state nature preserves. During these outings I met a number of dedicated naturalists, including Don Flenniken, who also had a passion for lichens.

Don and I both realized that Taylor's books had become outdated by rapidly advancing lichen taxonomy, and in 1990 we published an updated checklist to reflect the current taxonomy and to include new species finds (Flenniken & Showman, 1990).

This collaboration later led to the next milestone in Ohio lichenology. After Don's publication of The Macrolichens in West Virginia (Flenniken, 1999), we both agreed that it would be nice to have Taylor's books reprinted (they were by then years out of print) with revised taxonomy and nomenclature and with recent species additions to Ohio.

In preparation for this, Don visited lichen herbaria in the state and annotated many specimens with the correct nomenclature. I did additional field work, visiting some of the lesser collected counties. We had discussions with The Ohio Biological Survey about publication and it was finally decided to do a complete revision rather than a reprint of Taylor's work. This resulted in a single book covering the Ohio macrolichens, now up to 223 species (Figure 2. Showman & Flenniken, 2004).

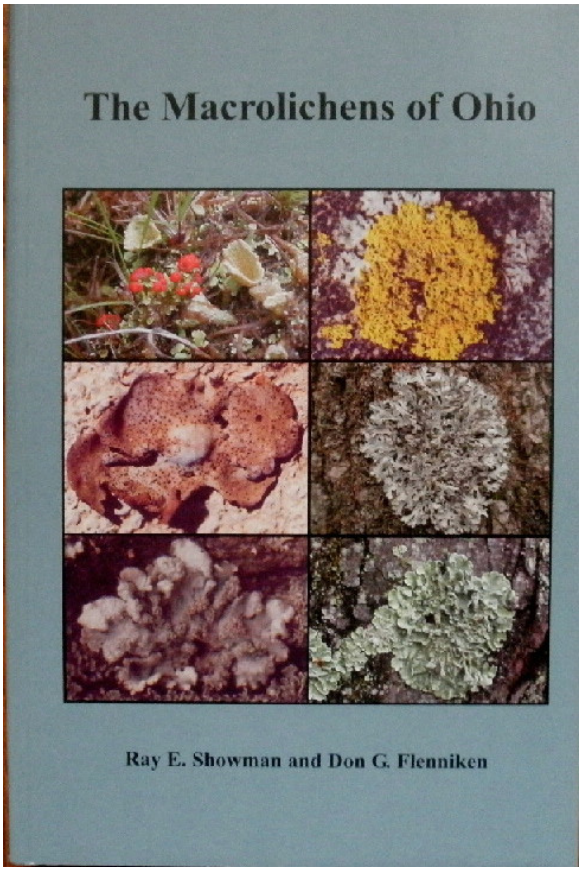


Figure 2. The Macrolichens of Ohio.
Photo by Ray Showman.

The next high point in Ohio lichenology occurred very soon afterward. Barb Andreas had the vision of starting a group of people interested in Ohio mosses and lichens, with the goal of encouraging the study of these organisms and adding to the knowledge of their distributions in Ohio. An organizational meeting of the Ohio Moss and Lichen Association (OMLA) was held in June, 2004 (Andreas et al. 2005), and as they say, the rest is history.

In the years since then, the OMLA has been successful beyond all expectations. The organization has held forays in 27 sparsely collected counties and has added 340 new macrolichen county records as well as updating many existing records. Members have also added 8 new state records for macrolichens and 5 new state records for crustose species. The known macrolichens of Ohio stands at 238 at this writing.

The OMLA has also been very successful in promoting the study of lichens and bryophytes in Ohio. Membership exceeds 50, including several student members. An annual newsletter, the OBELISK, records activities of the group, with new county records found during forays. It also includes articles on other aspects of bryology and lichenology, written for the nonprofessional. The OMLA sponsors an annual award for the best student paper published in the OBELISK. Member and webmaster Robert Klips also maintains an OMLA website (www.ohiomosslichen.org), which shares our activities and knowledge with anyone who is interested.

In summary, Ohio has had a number of dedicated individuals who have contributed to the knowledge of lichens. From Lea forward to the present, and with OMLA now firmly established, the future seems very bright.

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- Ray Showman

OHIO'S MANY NATURALISTS

Ohio has been very blessed,
with naturalists by the score,
they roam our fields and forests,
streams and fens and more.

They study almost everything,
frogs, flowers and trees,
birds are on their many lists,
as are mushrooms, snakes and bees.

But what about those lowly plants,
that grow on bark and ground?
There are also folks that study them,
wherever they are found.

William Starling Sullivant was the father,
of bryology they say,
he studied Ohio mosses,
when few others did in that day.

More recently we've had Jerry Snider,
and Barb Andreas we know;
they have furthered Ohio bryology,
more than we can show.

Our knowledge of Ohio lichens,
began with Thomas Lea,
who collected lichens in the area
around his home in Cincinnati.

Many others followed,
but Conan Taylor is of note,
his two books on Ohio lichens
will always get my vote!

And then we had Flenniken and Showman,
both charter members of OMLA,
whose book on Ohio macrolichens,
is the latest that we have today.

So we thank the many Ohio people,
who gave their energy and time,
to studied Ohio's biota,
and who are eulogized in this rhyme.

By Ray Showman

A BRIEF HISTORY OF OHIO MOSS COLLECTORS

Mosses have been collected in Ohio since the 1840s. The Consortium of North American Bryophyte Herbaria (bryophyteportal.org) contains about 33,000 Ohio herbarium records. These are from Ohio herbaria at Kent State University (KE), Miami University (MU), Ohio State University (OS), University of Cincinnati (CINC), and numerous U.S. herbaria, including Duke University (DUKE), Field Museum (F), New York Botanical Garden (NY), Missouri Botanical Garden (MO), Harvard University (FH), and the Philadelphia Herbarium at the Academy of Natural Sciences (PH). In terms of numbers of specimens, Ohio is among the best collected states.

There are moss records from every Ohio county. Counties with the most species, based on summaries from March 2018, are Hocking, 241 species; Jackson, 218; Franklin, 201; Adams, 192; and Cuyahoga, 190. Consortium herbarium records for these counties are Hocking, 3351; Jackson, 1536; Franklin, 973; Adams, 2042; and Cuyahoga, 554. All the herbaria mentioned above have specimens from these counties.

The abundance of herbarium specimens is the cumulative effort of many collectors over many decades, even centuries. Some of the most prolific are mentioned here.

The early- to mid-1800s. Studies of Ohio mosses began with William Starling Sullivant (1802–1873). He was born in Franklinton [Columbus], Ohio, and is considered to be the "father" of American bryology (Smith 1905, Giesy 1957).

Sullivant's interest in bryophytes began in the 1840's. He and his companion, Leo Lesquereux, continued to collect and identify mosses until the late 1800s. Sullivant's specimens are scattered throughout U.S. herbaria, but most are found at PH. Some of the mosses named by or for Sullivant (and Lesquereux) include *Bryhnia novae-angliae*, *Dicranum viride*, *Fontinalis novae-angliae*, *Fontinalis sullivantii*, *Orthotrichum ohioense*, *O. sordidum*, *Platydictya minutissima*, *Pohlia lescuriana*, *Thelia hirtella*, *T. lescurii* and *Tortula plinthobia*. Some of last sightings of Ohio's presumed extirpated species were seen by Sullivant and/or Lesquereux: *Archidium donellii*, *Bryum pallescens*, and *Pohlia lescuriana*.

A contemporary moss collector of Sullivant's era was Thomas Lea (see History of Lichenology, page 28 this issue of OBELISK). Lea collected in Hamilton County and surrounding areas in the 1840s. His specimens are housed at PH and FH.

***The late 1800*s.** Harry C. Beardslee (1878) published a list of 261 moss species. His collections are housed at NY and CMNH. William A. Kellerman and William C. Werner (1893) reported 267 species of mosses from Ohio, and this catalog included a complete history of botanical studies occurring in Ohio through that period (Snider and Andreas 1996). The bulk of their specimens are at NY. J.W. Eckfeldt collected in the Columbus area in the 1880s. His specimens are at PH. Hannah J. Biddlecome collected in the 1880s in Greene and Champaign counties. Her specimens are at PH, FH and NY. The liverwort, *Cololejeunea biddlecomiae* (Aust.) Evans, is named for her. E. Jane Spence collected in the same period, mostly in Clark and Champaign counties. Her specimens are at FH and PH.

***The early 1900s*.** Locally-focused papers were produced in the first three decades of the 1900s. Edo Claassen collected and published papers on mosses in Cuyahoga and surrounding counties. Claassen's specimens are housed at CMNH. Nellie Henderson (1931) wrote some of the first keys and descriptions for many moss groups, and Clifford H. Coles (1933) produced a checklist of mosses for Franklin County. The location of specimens collected by Henderson and Coles is unknown. Victor Sterki collected around the turn of the century, primarily in Ashtabula and Tuscarawas counties. His specimens are at MO. Henry Smith Jewett collected in the first decade of the 1900s, primarily in Montgomery and Ross counties. His specimens are housed at several herbaria, but primarily at DUKE and the Université de Montréal Biodiversity Center (MT). Additional publications from this period are found in Giesy (1957).

***The mid-1900s*.** Many amateur and professional bryologists were actively collecting Ohio mosses and liverworts in the decades between 1940 and 1960. These include Robert T. Wareham (specimens at OS), Almon Rood (specimens at KE), Floyd Bartley and Leslie Pontius (specimens primarily at BHO), Irma Schnooberger (specimens primarily at F), Frances Wynne (specimens at F and NY) Mary Taylor (specimens at F), Margaret Fulford (specimens at CINC), William Bridge Cooke (specimens at CINC), Harvey Miller (some specimens MU), Harold Robinson (specimens at BHO), Robert Giesy (specimens at OS), Richard Kellough (specimens at MU), and Fred Anliot

(specimens at DUKE). Selected publications from these two decades are found in Snider and Andreas (1996).

One of the most important publications in the history of Ohio mosses is *Studies in Ohio Bryophytes* by Robert Giesy (1957). He presented an in-depth history of Ohio bryology beginning before 1900 to 1957. He provided habitat descriptions along with county distributions for 331 species in 121 genera, and included the herbarium where the specimens were housed. This work was the basis for the 1996 Atlas (Snider and Andreas 1996), and eventually the formation of OMLA.

The late 1900s. Cyrus McQueen and Robert Giesy (1975) published a list of bryophytes from Cedar Bog, Champaign County. Jerry A. Snider and Allison W. Cusick (1987) re-collected the mosses at Cedar Bog. Amy J. Osterbrock and Snider (1985) surveyed nature preserves in Adams County and published the first list of mosses from Adams County. Jerry Snider surveyed bryophytes at various Ohio state nature preserves, including Hueston Woods (Butler County) (Snider 1984), and Lake Katharine (Jackson County) (1988). Gary Merrill (1983) listed the bryophytes of the Lake Erie Islands. Snider's specimens are housed at CINC, and Merrill's are scattered, with most of his Ohio collections at CINC.

Field studies of specific areas continued throughout the 1990s. Unpublished bryophyte surveys include those of Crane Hollow, Hocking County (Snider and He 1990), and of the Ravenna Arsenal, Portage and Trumbull Counties (Andreas 2001). Snider's collections are housed at CINC, and Andreas' are at KE. Sam Mazzer collected mosses in the Geauga County parks. His specimens are at KE. Donn Horchler and Roger Troutman collected numerous specimens throughout Ohio, often from cemeteries. Their specimens are at KE, CINC, and the Gorman Nature Center (Lexington, OH).

Many of the bryophyte collectors who began in the mid-1990s remain active today. Barbara Andreas (often with Diane Lucas, Jeff Knoop, or Ray Showman) collected throughout the state (specimens at KE). Diane Lucas (often with Andreas, Carol Portman or Pauline Munk) collected throughout Ohio, focusing on Lorain and Erie Counties. Her specimens are housed at CMNH and KE. Jim Toppin and Janet Traub have concentrated their collecting in northwestern Ohio, and their specimens are primarily at OS and KE.

Jerry Snider (1982) compiled the first paper on rare Ohio mosses. In 1990, mosses were added to Ohio's List of Rare Plants. Andreas (2013) described distributions and habitats for Ohio rare mosses, and explained the criteria used to list mosses as rare. Over the years, with increased knowledge of distributions, the number of listed mosses increased. By the 2016-2017 rare plant list, two mosses were listed as "threatened", 16, "endangered", and 9 "presumed extirpated" (Division of Natural Areas and Preserves 2016).

The early 2000s. Jeff Rose collected throughout Ohio, with a concentration in Delaware County. His specimens are at OS. Bob Klips, Cynthia Dassler and Jeff Rose made an extensive inventory of the bryophytes from Deep Woods, Hocking County (specimens are at OS). Rebekah Smucker collected in Carroll, Montgomery and Vinton counties, and her specimens are

at KE. Carole and Bill Schumacher have made extensive collections during the OMLA forays, and their specimens are at OS and KE.

Based on a method developed by Swink and Wilhelm (1979), Andreas and Lichvar (1995) published a technical report that assigned a numerical value (0-10) to northeastern Ohio vascular plant species. The method, called the Floristic Quality Assessment Index (FQAI), is used to evaluate the quality of a natural area. Andreas, Mack and McCormac (2004) expanded the FQAI for the entire state, and assigned numerical values to all Ohio vascular plants and Andreas added values for mosses. Bill Schumacher, as an ecologist for the Ohio Environmental Protection Agency, refined the FQAI, and used bryophytes to evaluate wetlands (Schumacher 2015, Schumacher et al. 2017).

Additional publications on Ohio mosses include a bryophyte study of Dysart Woods by Darrin Rubino and Morgan Vis (2001), a collection of mosses in the vicinity of Youngstown State University (Atwood and Chuey 2004), a bryophyte survey of Jefferson County (Andreas and Lucas 2006), a report on the first OMLA foray to Adams County (Andreas, Showman and Zloba 2005), and the results of the joint Crum/Tuckerman Combined Workshop in Adams, Gallia, Jackson, and Scioto counties (Andreas, Showman and Lendemer 2007). The most recent publication on Ohio mosses listed 17 mosses new to Ohio since 2004 (Andreas and Lucas 2017). It provided distributions for five of the 12 species whose Ohio county distributions were unknown, and verified the county distribution of 14 of the 68 taxa whose county distribution was known only from literature citations. The publication removed 10 species erroneously listed for Ohio by Snider and Andreas (1996).

Renewed interest and enthusiasm in Ohio mosses was spurred with the publication of *A Catalog and Atlas of the Mosses of Ohio* (Snider and Andreas 1996). This publication, along with the *The Macrolichens of Ohio* (Showman and Flenniken 2004), stimulated the formation of the Ohio Moss and Lichen Association in 2004. The history of OMLA since 2004 was compiled by Andreas (2011). Showman (2013) reported 543 new moss county distribution records were added during the first 21 OMLA county forays (31 counties have been surveyed to date).

Since OMLA's inception, many authors have compiled species lists from the annual forays, and have written articles about Ohio bryophytes. These are published in the OBELISK (ohiomosslichen.org). Knowledge of Ohio mosses (and bryophtyes), is increasing, thanks to OMLA members.

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- Barbara K. Andreas

MOSS MUSINGS – SUPPORT YOUR PROFESSIONAL ORGANIZATION, THE AMERICAN BRYOLOGICAL AND LICHENOLOGICAL SOCIETY

OMLA is an organization comprised of professional bryologists, highly skilled amateurs, and novices. OMLA's purposes include updating records of mosses, liverworts and lichens for the 88 Ohio counties, and to promote an interest in learning about Ohio cryptogams (bryophytes and lichens). As of 2018, we have surveyed 30 counties. OMLA has 72 members from 9 states. Fifteen of our members are students – the future of our organization. In my opinion, OMLA is more than exceeding its goals.

Once a year, OMLA publishes the *OBELISK*, a newsletter with articles written by members. These articles cover the results of the annual forays, as well as topics of interest. Often it might be the only cryptogamic literature read by our members.

There is another journal that would be of interest to OMLA members, *Evansia*. *Evansia* is one of two journals of the American Bryological and Lichenological Society (ABLS). *Evansia* publishes articles dealing with lichens and bryophytes. A typical issue includes, but is not limited to, articles on new regional records; lists of

lichens and bryophytes from a special natural area county, or state; a review of a taxonomic group; history of an organization or a person; and collecting techniques. *Evansia* is published four times a year. Most articles cover topics in the United States, but occasionally there are articles of an international nature.

In order to receive *Evansia*, one must join ABLS. A basic membership of ABLS is $25, and an additional $25 to receive a printed copy of *Evansia* (a digital copy is $15). The more scientific journal of ABLS, *The Bryologist*, costs an additional $60. *The Bryologist* is an international journal dealing with research papers, often molecular in nature.

In addition to receiving *Evansia*, there are other reasons to join ABLS. One reason is to broaden your knowledge of cryptogams. It is interesting to see that a familiar moss or lichen is new to another state. Another reason is to become familiar with the names of folks just like us, doing the same kind of surveys and forays. Another is to be motivated by reading about a topic that inspires one to look more closely at a specimen, or buy a new book.

Most importantly, belonging to ABLS says that we care about lichens, liverworts and mosses. There is strength in numbers. Our membership tells government and granting organization that cryptogams matter. To join, go to **http://www.abls.org**. It's a wise educational investment.

– Barbara K. Andreas

A TRIP TO CRANE HOLLOW

This is the story
of a recent Fall Foray
to a distant and rugged county;
it was chosen with care,
for the habitats there,
and its lichen and bryophyte bounty.

Crane Hollow by name,
is known for its fame,
as a wild and wonderful gorge;
cliffs and streams,
rare plants in reams,
and all that nature can forge.

We meet at nine,
and that's just fine,
'cause it gives us time to explore;
the rocks and rills,
the trees and hills,
and find new records galore.

Joe is there,
to guide us with care,
and make sure that we don't lose our way;
Bob is ready,
his camera is steady,
to take photographs of the day.

Carole and Bill,
are first down the hill,
to see what mosses they find;
Tomás and Ray,
jump into the fray,
and Barb is not far behind.

There's lots to study,
with a scope and a buddy,
and keys that are clear and concise;
and learning is fun,
something for everyone,
and all the new records are nice.

The weekend is done,
it's been lots of fun,
and the memories we have are great;
so it's home we go,
to plan the next show,
whatever you do don't be late!

- Ray Showman

2018 FALL FORAY CONDUCTED AT CRANE HOLLOW PRESERVE, HOCKING COUNTY

History. In terms of cryptogams, Hocking County is the best collected county in Ohio. Of the approximately 420 Ohio moss species, 244 have been collected in Hocking County. One of the most diverse areas in Hocking County is the Crane Hollow Preserve. Snider and Se (1990) performed a thorough survey of bryophytes in Crane Hollow. They found 179 mosses, 45 liverworts, and 3 hornworts. During further exploration of Crane Hollow Preserve, Barb Andreas and Joe Moosbrugger found *Neckera pennata* (Andreas & Lucas 2017), and *Loeskeobryum brevirostre*.

Hocking County is rich in macrolichens. Of the approximate 225 species in Ohio, about 120 were reported from Hocking County. Ray Showman (1987) published a list of the macrolichens from Crane Hollow Preserve. He reported 77 species. In a follow-up survey, he reported five more species (Showman 1993).

Crane Hollow Preserve is named for the large hollow running from north to south throughout the preserve. The northern third of this valley is comprised of two near-equal sized drainages that form a "Y," with Crane Hollow to the west and Hood Hollow to the east.

William and Jane Ann Ellis founded Crane Hollow in 1977 with the purchase of 434 acres within the Crane Hollow watershed. In 1978, they purchased an additional 55 acres, and these properties formed the nucleus of Crane Hollow Preserve.

In the 1980s and 1990s, additional parcels were purchased. A partnership was formed between the Ohio Department of Natural Resources' (ODNR) Division of Natural Areas and Preserves (DNAP) and Crane Hollow Preserve, allowing for the dedication of part of Crane Hollow to be the 96th dedicated state nature preserve. Crane Hollow Preserve is composed of both dedicated and non-dedicated parcels. As of September 2018, 1,285 acres are dedicated, with an additional 702 acres being non-dedicated, but still managed by Crane Hollow Preserve. In all, Crane Hollow Preserve is composed of 1,987 acres.

The purpose of selecting Crane Hollow Preserve for the fall foray was to visit land acquisitions added to the Preserve after the first surveys by Snider, Se and Showman. Crane Hollow also provided an opportunity for OMLA members to see a high diversity of species.

Andreas, B.K. and D. H. Lucas. 2017. Additions to the Ohio moss atlas: contributions to the Ohio moss atlas by a group of amateur and professional bryologists. Evansia 34: 156 – 166.

Showman, R.E. 1987. Macrolichen flora of Crane Hollow, Hocking County, Ohio. Ohio J Sci: 27 – 29.

Showman, R. E. 1993. Macrolichen flora of Crane Hollow – Additional Studies. Unpublished report. 3 p.

Snider, J.A. and S. He. 1990. A Catalogue of the Bryophytes of Crane Hollow Nature Preserve, Hocking County, OH. Unpublished Report.106p.

2018 Fall Foray Results. On Friday, 28 September 2018, OMLA visited a non-contiguous and non-dedicated parcel located to the east of the town of South Bloomingville (S on the bryophyte table). On Saturday, 29 September 2018, OMLA visited two non-contiguous and non-dedicated parcels, Early Hollow and Goldmine Hollow (E and G on the lichen and bryophyte tables), located to the east of St. Rt. 374, near Gibisonville. On Sunday, 30 September 2018, OMLA surveyed the south-facing rim of Young Hollow, part of the contiguous and dedicated Crane Hollow holdings (Y on the bryophyte and lichen tables).

BRYOPHYTE RESULTS. Results of the bryophytes found during the 2018 fall foray are presented in the table below. Ninety six moss species, 33 liverwort species, and one hornwort species were collected from the study areas. Diane Lucas found *Orthotrichum ohioense* near the Crane Hollow Preserve office.

Three species are new to Hocking County: *Bryoerythrophyllum recurvirostrum* (Pottiaceae), collected by Carole and Bill Schumacher; *Didymodon ferrugineus* (Pottiaceae), collected by Megan Osika; and *Orthotrichum speciosum* (Orthotrichaceae), collected by Barb Andreas. Eleven moss species and nine liverwort species are reported as new for the Crane Hollow Preserve.

Bryophytes found in Crane Hollow Preserve, during the Fall Foray, 9/28-30/18. S = Schoolhouse, E = Early Hollow, G = Goldmine Hollow and Y = Young Hollow. N= New to Hocking County. C=new for Crane Hollow Preserve.

Moss Name	S	E	G	Y
Amblystegium varium				X
Amphidium mougeotii		X		
Anomodon attenuatus	X	X		X
Anomodon rostratus	X	X		
Aphanorrhegma serratum			X	
Atrichum angustatum		X	X	X
Atrichum crispulum	X	X	X	
Aulacomnium heterostichum	X		X	
Barbula unguiculata	X			
Brachythecium falcatum	**C**			
Brachythecium laetum	**C**		**C**	
Brachythecium plumosum			X	
Brothera leana	X			
Bryhnia graminicolor		X	X	
Bryhnia novae-angliae	X	X		
Bryoandersonia illecebra	X	X		
Bryoerythophyllum recurvirostrum		**N**		
Bryoxiphium norvegicum		X		
Bryum argenteum	X			
Bryum lisae var. *cuspidatum*	**C**			
Bryum pseudotriquetrum	X			
Calliergonella lindbergii			X	
Campylium chrysophyllum	X			
Campylium hispidulum				X
Campylopus tallulensis		X		X
Ceratodon purpureus		X		
Climacium americanum	X			
Climacium kindbergii		X		
Ctenidium molluscum		X		X
Dicranella heteromalla			X	X
Dicranodontium denudatum		X		
Dicranum condensatum				**C**
Dicranum flagellare	X	X	X	X
Dicranum fuscescens		**C**		
Dicranum fulvum	X	X	X	X

Dicranum montanum	X	X	X	X
Dicranum ontariense		X		
Dicranum scoparium	X	X		X
Dicranum spurium	X			X
Didymodon ferrugineus	**N**			
Diphyscium foliosum	X	X	X	
Entodon seductrix			X	X
Eurhynchium hians			X	
Fissidens adianthoides		X		
Fissidens bryoides	X		X	
Fissidens bushii	X	X	X	
Fissidens dubius				X
Fissidens elegans		X	X	
Fissidens osmundioides		X	X	X
Fissidens subbasilaris		X		X
Funaria hygrometrica		X		
Grimmia laevegata				**C**
Haplohymenium triste		X	X	X
Hedwigia ciliata	X			
Herzogiella striatella		X		
Homalotheciella subcapillata		X	X	
Homomallium adnatum		**C**	**C**	
Hookeria acutifolia	X	X		
Hygroamblystegium tenax			X	
Hypnum curvifolium	X		X	
Hypnum imponens	X		X	X
Hypnum pallescens		X	X	X
Isopterygiopsis muelleriana			X	
Isopterygium tenerum	**C**		**C**	
Leskea gracilescens		X	X	
Leucobryum albidum	X	X	X	
Leucobryum glaucum	X	X	X	X
Mnium hornum	X		X	
Orthotrichum speciosum			**N**	
Plagiomnium ciliare		X	X	
Plagiomnium cuspidatum	X			X
Plagiothecium cavifolium		X	X	
Plagiothecium laetum			X	
Platygyrium repens	X	X	X	X
Platyhypnidium riparioides		X	X	
Pogonatum pensilvanicum			X	
Pohlia nutans		X		X
Polytrichastrum ohioense	X	X	X	X
Polytrichum piliferum		X	X	X

Pseudotaxiphyllum distichaceum			X	
Pseudotaxiphyllum elegans		X	X	
Pylaisiadelpha recurvans		X		X
Pylasiadelpha tenuirostris	X	X	X	X
Rhizomnium punctatum		X	X	
Rhynchostegium serrulatum	X	X	X	X
Schistidium apocarpum				**C**
Sematophyllum adnatum	**C**		**C**	
Sematophyllum demissum	X		X	
Syrrhopodon texanus		X		
Taxiphyllum deplanatum	X	X	X	
Tetraphis pellucida	X	X		X
Thamnobryum alleghaniense		X		
Thuidium delicatulum	X	X		X
Trichostomum tenuirostre			**C**	
Tortella humilis				X
Ulota crispula			X	
Liverwort Name	**S**	**E**	**G**	**Y**
Asterella tenella		X		
Bazzania trilobata	X		X	
Calypogeia muelleriana			X	X
Calypogeia neesiana		**C**		
Calypogeia neogaea			X	X
Cephalozia bicuspidata			**C**	
Cephalozia connivens		X		
Cephalozia lunulifolia	X			X
Cephaloziella rubella				**C**
Cololejeunea biddlecomiae		X	X	
Conocephalum salebrosum	X	X	X	
Diplophyllum apiculatum	X	X	X	X
Frullania asagrayana	X			
Frullania eboracensis		X		X
Harpanthus scutatus			**C**	
Jamesoniella autumnalis				**C**
Jubula pennsylvanica		X	X	
Jungermannia crenuliformis				X
Jungermannia pumila	X			
Kurzia sylvatica		X	X	
Lophocolea heterophylla	X	X	X	
Lophozia bicrenata = Isopaches bicrenatus				**C**
Metzgeria crassipilis			**C**	
Nowellia curvifolia	X	X	X	

Odontoschisma denudatum	X	X		X
Odontoschisma prostratum		X	X	X
Pallavicinia lyellii		X	X	X
Pellia epiphylla		X	X	
Plagiochila austinii			**C**	
Plagiochila porelloides		X	X	
Porella platyphylla	X		X	
Radula complanata			**C**	
Scapania nemorea	X	X	X	X
Hornwort Name	**S**	**E**	**G**	**Y**
Notothyas orbiculatus		X		

LICHEN RESULTS. Three locations in the Crane Hollow Preserve were searched for lichens: Early Hollow (including the parking area), Goldmine Hollow and Young Hollow. In all areas, only the south-facing slopes were visited. A total of 49 species of macrolichens and 47 crustose species (collected only from Early and Goldmine Hollows) were recorded. There were also 3 species of nonlichenized allied fungi identified.

Hocking is one of the most studied counties in Ohio for macrolichens, with 120 species recorded. Even so, this foray found 4 species which had not been previously reported. *Punctelia borreri* is listed as new because earlier collections were almost certainly misidentified. *Canoparmelia caroliniana* is a state-listed species with records from only 5 counties.

There were 8 macrolichens that are reported for the first time in Crane Hollow. Since crustose lichens have not been studied at Crane Hollow all of the crustose species found during this foray are new for Crane Hollow.

Crustose lichens have not been well studied in Ohio and many of these listed below are probably new for Hocking County. Several crustose specimens were collected which did not fit the existing keys and may either be atypical or new to science. These were sent to Dr. James Lendemer at the New York Botanic Garden for his expert opinion.

Lichens found in Crane Hollow Preserve, during the Fall Foray, 9/29-30/18. E = Early Hollow, G = Goldmine Hollow and Y = Young Hollow. N=new for Hocking County, C=new for Crane Hollow.

Lichen Name	**E**	**G**	**Y**
Foliose and Fruticose Lichens			
Anaptychia palmulata	X		
Candelaria concolor	X		
Canoparmelia caroliniana **N, C**		X	
Cladonia coniocraea	X	X	X
Cladonia cristatella	X		X
Cladonia cylindrica	X		
Cladonia didyma **N, C**		X	X
Cladonia furcata	X		
Cladonia macilenta **C**			X
Cladonia mateocyatha **C**	X		
Cladonia ochrochlora **N, C**	X		
Cladonia pyxidata	X		
Cladonia pyxidata complex	X	X	X
Cladonia rangiferina = *Cladina rangiferina*	X	X	X
Cladonia squamosa	X	X	X
Cladonia subtenuis = *Cladina subtenuis*	X	X	X
Cladonia uncialis	X		X
Crespoa crozalsiana = *Canoparmelia crozalsiana*	X	X	X
Dermatocarpon luridum	X		
Dibaeis absoluta			X
Flavoparmelia baltimorensis			X
Flavoparmelia caperata	X	X	X
Heterodermia obscurata	X	X	X
Heterodermia speciosa			X
Hypotrachyna livida		X	X

Hypotrachyna minarum = Parmelinopsis minarum	X	X	X
Hypotrachyna showmanii	X	X	
Imshaugia aleurites	X	X	X
Imshaugia placorodia	X		
Lasallia papulosa	X	X	X
Melanelixia subaurifera	X		
Myelochroa aurulenta	X	X	
Myelochroa galbina		X	
Parmelia sulcata	X		
Parmotrema hypotropum	X	X	X
Parmotrema reticulatum = Rimelia reticulata **C**	X		
Phaeophyscia adiastola			X
Phaeophyscia rubropulchra			X
Physcia adscendens	X		
Physcia americana	X	X	X
Physcia millegrana	X	X	X
Physcia stellaris	X	X	
Punctelia borreri **N, C**	X		
Punctelia caseana = Punctelia subrudecta	X		X
Punctelia missouriensis **C**	X	X	
Punctelia rudecta	X	X	X
Pycnothelia papillaria	X		
Pyxine sorediata	X	X	
Usnea amblyoclada			X
Usnea strigosa	X		
Xanthoparmelia conspersa	X		X
Crustose Lichens			
Acarospra fuscata	X		
Arthonia apatetica		X	
Bacidia schweinitzii	X	X	
Bacidia sorediata	X		
Biatora printzenii	X	X	
Botryolepraria lesdainii	X	X	
Caloplaca reptans	X		
Candelariella efflorescens	X		
Catillaria nigroclavata	X		
Chaenotheca xyloxena	X		
Chrysothrix caesia	X		
Flakea papillata		X	
Fuscidea recensa	X		
Graphis scripta	X	X	

Hypocenomyce scalaris	X		
Japewwiella dollypartoniana	X		
Julella fallaciosa	X		
Lecania croatica	X		
Lecanora hybocarpa	X	X	
Lecanora layana	X	X	
Lecanora nothocaesiella	X		
Lecanora oreinoides	X		
Lecanora strobilina	X		
Lepra pustulata		X	
Lepraria caesiella		X	
Lepraria cryophila	X	X	
Lepraria disjuncta	X		
Lepraria finkii	X	X	
Lepraria harrisiana	X	X	
Lepraria hodkinsoniana	X	X	
Lepraria neglecta	X	X	
Lepraria normandinoides	X	X	
Leprocaulon adhaerens	X		
Ochrolechia yasudae	X		
Pertusaria globularis	X		
Pertusaria plittiana	X		
Phlyctis petraea	X		
Porpidia albocaerulescens	X	X	
Porpidia crustulata		X	
Porpidia subsimplex	X		
Racoduim rupestre		X	
Rinodina papillata	X		
Scoliciosporum pensylvanicum		X	
Scoliciosporum umbrinum		X	
Segestria lectissima	X		
Thelotrema subtile		X	
Trapelia placodioides	X	X	
Viridothelium virens	X		
Nonlichenized "allied fungi"			
Chaenothecopsis debilis	X		
Chaenothecopsis nigra	X		
Mycoporum compositum	X	X	

- Barbara K. Andreas and Ray Showman

NEWS AND NOTES

The OMLA Winter Meeting will be held at Dawes Arboretum on Saturday, **February 23, 2019**. The meeting will begin at 10:00 and last until around 3:00. It will feature two introductory presentations. Ian Adams will give a talk on The World of Lichens, and Bill and Carole Schumacher will do a workshop on keying out mosses using the book Common Mosses of the Northeast and Appalachians. There will also be a short business meeting. You are welcome to bring scopes and material to look at, but time for this may be limited due to the presentations. Bring a lunch and snacks to share.

The upcoming Summer Foray will be in Wood County, organized by Jim and Janet, date to be set at the Winter Meeting. The Fall Foray is being planned by Bob Long. It will be a joint OMLA – Pennsylvania group effort in NE Ohio, date yet to be determined.

We received the following request recently and it looks like a great project for OMLA. Let's discuss it at the Annual Meeting.

INVITATION TO CONTRIUTE *PHYSCOMITRIUM* SAMPLES TO RESEARCH PROJECT

Dear friends from the Ohio Moss and Lichen Association,

We would like you to consider sending us your upcoming collections of *Physcomitrium* to be part of a new research project, a collaboration among the University of Connecticut, Texas Tech University, and Augustana College. We are using this moss as a model system to study plant evolutionary mechanisms and we would appreciate samples from Ohio (or elsewhere in the Midwest). Since their purpose will be culturing, we need recent collections with viable spores (mature but still operculated capsules preferred). *Physcomitrium* mosses are typically spring ephemerals found in disturbed soils, croplands and lawns.

We are also looking for bryologists interested in becoming active participants in the project. We are open to collaboration and willing to share our data with colleagues who submit critical specimens or contribute in a continued way, and we will invite them to join authorship of selected papers resulting from this project. If you are interested in participating, please submit your name through this on-line form: https://funariaceae.uconn.edu/participating-in-project/

Since *Physcomitrium* colonies are easy to find, this might also be a good opportunity to engage naturalists still unexperienced with mosses: Anybody can easily collect and send samples that will be used to learn about moss evolution. We have prepared the citizen science campaign named "PhyscoHunt" for this purpose. A training document to get any interested person started can be found at https://funariaceae.uconn.edu/contribute-samples/. Please disseminate and share this resource among students, local botanical groups, etc. If you want to send your *Physcomitrium* samples for us to culture and include in the project, send them to
Bernard Goffinet, Ecology and Evolutionary Biology, University of Connecticut
75 North Eagleville Rd, Storrs, CT.
Thank you.
Rafael Medina
(rafaelmedina@augustana.edu)

Project website: http://funariaceae.uconn.edu

2018 Summer Foray, Wayne County. Left to right: John Abt, Dean Porter, Azam Abdollahzadeh, Diane Lucas, Barb Andreas, Jim Toppin, Cathy Long, Bob Long, Janet Traub, Steve Upperman, Ray Showman, Julia Weisenberg, David Weisenberg, Chris Poling, Tomás Curtis, Kate Pilacky, Bob Klips.

2018 Fall Foray, Crane Hollow, Hocking County. Left to right: Kyle Hartshorn, Ray Showman, Ian Adams, John Pogacnik, Shaun Pogacnik, Megan Osika, Becky Smucker, John Holliger, Diane Lucas, Dean Porter, Jenny Durham, Bob Long, Cynthia Dassler, Joe Moosbrugger, Kathy Long, Patrice Beal, Barb Andreas, Joshua Copen, Brandon Davis, Lauren Baldarelli, Carole Schumacher, Bill Schumacher, Ed Fuchs, Bob Klips, Chris Poling, Bob Klips, Tomás Curtis.