OBELISK

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

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EDITORS' NOTE

Don Flenniken founded the OMLA newsletter, OBELISK, in 2005 and single handedly produced the first three issues. In 2007 he accepted me as co-editor and we expanded the newsletter as a digital publication. This year, Don has decided to step down as editor but certainly not as a contributor (as evidenced by this issue). Janet Traub has agreed to be the new co-editor and we welcome her contributions. **Thank you Don for your great ideas and your hard work! - RES and JT**

LEFT HAND CORNER

Lumpers and Splitters

For those of us whose interest is in things that move or grow, we tend to look at those things in order to discriminate differences, on one hand, and similarities, on the other. Our judgement of *likeness* is expressed in families and genera. Those judgements of *differences* are often expressed in species. And, just like the mosquito bite, that's where the rub comes in.

There are those who look for anything, however minute, in order to call it something new. One of the principles that Darwin put forth is that no two things are ever exactly alike. For example, no two leaves on the same tree are exactly the same size, have the same number of teeth along the margins, or have the same number of hairs along the midrib, etc., etc. That does not make each leaf a different species.

There are, also, those who see no differences at all. A genus, to him or her, is just a box in which to stuff his species until the lid will no longer close. At the time I first became interested in lichens fifty years ago, I first arrived at the conclusion that, when it came to lichens, there was only one, highly variable, species. Truth be known, however, most of the lichens at that time could be placed in the genera *Cladonia, Parmelia, Lecidea, Lecanora,* or *Usnea.* Then as the saying goes, the rest is history.

I suppose we will always have "Splitters" and "Lumpers". The splitters are constantly removing specimens from the box, while the lumpers are stuffing them back in. Sometimes it is nearly impossible to keep up with it all.

Someone once said, "God made families and genera; man makes species". It all begs the question posed from a time much earlier:

> Shall mortal man be more just than God?
> Shall a man be more pure than his maker?
> -Job IV:17-

Yet, in Thessalonians I, 5: 21, we are commanded to, "Prove all things. Hold fast to that which is true." And so, whether you are a lumper or splitter, it falls on you to justify your conclusion.
- Don Flenniken

NEW LICHEN FOR OHIO
Where should one look for new state records? Remote places that are seldom visited? Mysterious hollows with high rocky sides? Or maybe a permit-only nature preserve. Any of these could have a new state record lichen or moss – but so could your own back yard! And that is literally where this new record was found. One morning while replenishing my backyard bird feeders I noticed several lichens on the ground, dislodged from the tree canopy by foraging nuthatches. Most were common species but one was not familiar so I took it inside for examination. It turned out to be *Usnea cornuta*, not reported for Ohio.


Usnea cornuta. Photo by Ray Showman

This species is a small, tufted fruticose lichen with branches constricted at the base, giving them an inflated appearance. Lichens of North America shows a spotty distribution with populations in the Smoky Mountains and in New Mexico. It is also reported to be common in coastal Maine. This lichen has soredia, microscopic propagules that can be windborne for hundreds of miles. Thus it can sometimes pop up far from its established range. It will remain to be seen if more individuals can be found in Ohio.

I guess the moral of this story is that you never know what you might find close by. Get out there and look; be observant and be curious. **- Ray Showman**

HUMMINGBIRD NEST LICHENS
Most naturalists and birders know that some birds, notably the Ruby-throated Hummingbird (*Archilochus colubris*) and Blue-gray Gnatcatcher (*Polioptila caerulea*), use lichens to camouflage their nests. Both species build their nests on small branches, frequently in the axil of two branches. The completed nest resembles a knot and is undetectable from more than a few feet away.


Hummingbird nest camouflaged with lichens. Photo by Jim McCormac

Although the lichen camouflage of these nests is well known, we could find no references to the species of lichens used. With this in mind, nest specimens were requested from the Ohio State Museum of Biodiversity, the Cleveland Museum of Natural History, and other sources. These were examined with the aid of a dissecting microscope, and the lichens incorporated on the nests were identified to the extent possible. In most of these old specimens, the lichens did not retain their original

living color but had faded to a uniform browish-gray color. However, identification of the lichens was possible based on lobe size and shape, surface characteristics, the presence of cilia, and undersurface color.

Fourteen hummingbird nests were examined. Of these, 11 were from various locations in Ohio, two were from Pennsylvania with one from Indiana. All of the nests were camouflaged with tiny bits of lichen. These were exclusively the lobe tips of lichens rather than pieces from the center of the thallus. The size was fairly uniform, around 3-4 mm on a side.

Lichens found on the hummer nests included *Parmelia sulcata*, the Hammered Shield Lichen – 12 nests; *Punctelia* sp., Speckled Shield Lichens – 7 nests; *Flavoparmelia caperata*, Common Greenshield Lichen – 9 nests; *Parmotrema* sp., Ruffle Lichen – 1 nest; and *Myelochroa aurulenta*, Powdery Axil-bristle Lichen – 1 nest. Of these lichens, *Parmelia sulcata* was by far the most prevalent, both on the number of nests and as the percent occurrence on nests. This is a small to medium sized foliose lichen with relatively narrow, strap-shaped lobes.

Parmelia sulcata Photo by Ray Showman

All of the hummer nest lichens share several characteristics. They are all common foliose lichens, present in most Ohio counties; they all grow on twigs and branches, as well as the trunks of trees; and none are tightly appressed to the bark, at least at the lobe tips. It stands to reason a hummingbird would choose a nearby lichen to camouflage her nest. It is also apparent that the lichens used were species which could be removed by the tiny bill of a hummingbird. Other common twig and branch lichens either have very tiny lobes (*Physcia millegrana*), or are tightly appressed and not easily removed (*Physcia aipolia* and *Physcia stellaris*).

Twelve Blue-gray Gnatchatcher nests, all from various locations in Ohio were examined. These were also heavily shingled with bits of lichen lobe tips. The size of the lichen bits was somewhat larger, around 4-6 mm on a side. The same species were found on the gnatchatcher nests with the exception of *Myelochroa aurulenta* which was absent. *Parmelia sulcata* was again a favored material, but *Flavoparmelia caperata* and *Parmotrema* sp. were used in greater percentage on some gnatcatcher nests. These two species have broader lobes than *Parmelia sulcata* and the choice of these species may reflect the preference for slightly larger lichen pieces. Otherwise, the general characteristics detailed above for the hummingbird nest lichens also apply to the gnatcatcher nest lichens.

- Ray Showman and Jim McCormac

"There are no passengers on Space Ship Earth...we are all crew members"
- Marshall McLuhan

A FASCINATING SHOW

Oh those lichens are a fascinating show;
They'll captivate your interest don't ya know;
You can find them in most places,
Though they take on many faces;
Oh those lichens are a fascinating show!

Oh I see some crusty lichens on a post;
They are harder to identify than most;
There might be some *Lecanora*,
Some *Buellia* and *Psora*;
Oh I see some crusty lichens on a post!

Oh I see some leafy lichens on a tree;
I'd bet there's some Parmeliaceae;
We can key them out tomorrow,
If some K, C, P we borrow;
Oh I see some leafy lichens on a tree!

Oh I see some shrubby lichens on the ground;
They're also found on trees and rocks around;
Our Ohio has a bounty,
Fruticose in every county;
Oh I see some shrubby lichens on the ground!

Oh those lichens are a fascinating show;
You can see them almost everywhere you go;
Look on trees and soil and outcrops,
Sometimes even city sidewalks;
Oh those lichens are a fascinating show!

- Ray Showman

This poem can be sung to the tune of a popular campfire song. See if you can figure out which one.

Polytrichum piliferum IN NORTHWEST OHIO

Although *Polytrichum piliferum* is reported from 12 Ohio counties, the only record for northwest Ohio is from Lucas County. Here *P. piliferum* grows on the sandy soils of the Oak Openings region. It is readily recognized in the field by leaves with long, clear hairpoints and by its occurrence in dry, open sandy areas, where it grows among grasses or under small trees, often with mosses such as *Ceratodon purpureus*, and lichens, including *Cladonia cristatella*, forming a biological soil crust.

P. piliferum with developing sporophytes (November 2010). The plants are mostly brownish in this photo due to recent dry weather, but the clear hairpoints of the leaves are evident whether the plants are moist or dry. Photo by James Toppin

Three other *Polytrichum* species occur in the Oak Openings region, where they are fairly easy to distinguish by habitat: *P. commune* (wet to mesic open areas), *P. ohioense* (woods, common), and *P. juniperinum* (dry open woods, not common). *P. piliferum* is also much smaller: the leafy plants are typically an inch tall or less. Another aid to recognition with a hand lens is the basic leaf shape: *P. commune* and *P. ohioense* have a flat leaf,

while *P. juniperinum* and *P. piliferum* have the upper leaf edges folded inwards to cover the upper surface of the leaf.

Typical masses of *P. piliferum* under small trees in the Oak Openings region. Photo by James Toppin

P. piliferum is possibly present in other northwest Ohio counties that have Oak Openings habitat (Fulton, Henry, and Wood counties).We didn't find it on our recent foray to Henry County, but we were in areas not suited to it (woods and wet prairie). Any dry open areas with sandy soil are potential sites for this species in northwest Ohio. - **Jim Toppin**

HENRY COUNTY SUMMER FORAY

The 2010 Summer Foray was held on June 19 in Henry County. See the last page of this issue for a photo of participants. Located in the northwest corner of Ohio, Henry County is predominantly agricultural with 91% farmland. We visited two sites in Maumee State Forest, which is one of the few sizable areas of public land in Henry County. The state forest is in the northeast corner of the county, situated on the primarily sandy soils of the Oak Openings region, which contains a remarkable concentration of rare vascular plants and rare ecological communities. The sand is a remnant of Lake Warren, which preceded Lake Erie. (For information on the habitats of the Oak Openings region, visit www.oakopenings.org or www.metroparkstoledo.com, under "Oak Openings Preserve.").

In the morning we collected on the muck soils of the Muck Farm wet sedge meadow (a mostly open area with a few shrubs) and on sandy soils in the adjacent forest areas. In the afternoon, after lunch at nearby Providence Dam Metropark on the Maumee River, we moved to an oak woodland site, the South Seed Orchard. This was a generally drier site, with low dunes and swales, providing a sharp contrast between dry and wet habitats (including vernal pools). It is typical of most of the Maumee State Forest land, other than the Muck Farm and several conifer plantations. Our foray to Henry County yielded 61 moss species and 8 liverworts. These include new county records for 43 mosses.

Lichens are not evenly distributed across Ohio. The hilly, unglaciated counties of eastern and southern Ohio contain many more species than the flatter, agricultural counties of northwestern Ohio. This is due both to the amount and kinds of habitat present and the past collecting effort. Henry has been one of the more heavily collected northwestern counties with 34 recorded species of macrolichens prior to this Foray (see the number of species per county at www.ohiomosslichen.org).

The Muck Farm and South Seed Orchard were searched for lichens but proved to be fairly poor lichen habitat – shady, dense woods with no exposed soil or rocks. Thus, the Foray lichen list for Henry County was augmented by visiting more open sites in the State Forest: Horseman's Area, Lutheran Youth Center, Pine Access

Area and Migrant Rest Center. Several other areas in the county were also visited: Texas Cemetery, Napoleon Cemetery and Maumee Riverlook and Canal (US 24, ca. 3 miles west of Providence Park). With these additional sites, a list of 25 macrolichens and 14 crustose species was compiled. This included 13 new macrolichen records. The microlichens are as yet so poorly known that no attempt was made to determine county records.

Two of the macrolichen species deserve mention. This is only the second report of *Physciella melanchra* in Ohio (the first was the 2009 OMLA Summer Foray in Darke County). It is expected that additional searching in the western counties of Ohio will turn up more records for this species. *Ramalina americana* is a fairly uncommon fruticose lichen but the Henry County collection is almost certainly a hitch-hiker on nursery stock (see the 2009 OBELISK for an article on hitch-hiking lichens).
- Ray Showman and Jim Toppin

Henry County Bryophytes collected during the foray. Locations are the Muck Farm (MF) and the South Seed Orchard (SS); N = New county record.

Bryophyte Name - Mosses	**M F**	**SS**
Amblystegium serpens		X
Amblystegium varium	X	X
Anomodon attenuatus **N**		X
Anomodon rostratus		X
Atrichum altecristatum **N**	X	X
Atrichum angustatum **N**	X	
Atrichum crispulum **N**	X	
Atrichum tenellum **N**		X
Aulacomnium palustre **N**	X	X
Barbula unguiculata	X	
Brachythecium acuminatum **N**		X
Brachythecium rivulare **N**		X
Brachythecium rutabulum **N**		X
Brachythecium salebrosum **N**		X
Bryoandersonia illecebra **N**	X	
Bryum argenteum	X	
Bryum lisae var. cuspidatum	X	
Bryum pseudotriquetrum **N**	X	
Callicladium haldanianum	X	
Campylium chrysophyllum **N**	X	
Campylium stellatum **N**	X	
Ceratodon purpureus		X
Climacium americanum **N**	X	
Dicranum polysetum **N**	X	
Dicranum scoparium **N**	X	
Drepanocladus aduncus **N**	X	
Entodon cladorrhizans **N**		X
Entodon seductrix	X	
Eurhynchium hians **N**	X	
Fissidens adianthoides **N**	X	
Haplocladium microphyllum **N**		X
Haplocladium virginianum		X
Helodium blandowii **N**	X	
Hygroamblystegium tenax **N**		X
Hypnum curvifolium **N**	X	
Hypnum lindbergii **N**	X	X
Hypnum pallescens **N**		X
Leptodictyum riparium **N**	X	
Leskea gracilescens **N**	X	X
Leucobryum albidum **N**	X	
Leucobryum glaucum **N**	X	
Orthotrichum obtusifolium **N**	X	
Orthotrichum pumilum **N**	X	
Plagiomnium ciliare **N**	X	
Plagiomnum cuspidatum	X	
Plagiomnium rostratum	X	
Plagiothecium cavifolium		X
Plagiothecium denticulatum **N**	X	X
Plagiothecium laetum	X	X
Platygyrium repens	X	X
Polytrichum commune **N**	X	
Polytrichum juniperum **N**	X	
Polytrichum ohioense	X	
Pylasiadelpha tenuirostris	X	
Pylasiella selwynii **N**	X	
Rhizomnium punctatum **N**	X	
Rhynchostegium serrulatum **N**	X	X
Sematophyllum adnatum **N**		X
Tetraphis pellucida **N**		X

Thuidium delicatulum **N**	X	
Liverworts		
Calypogeia fissa	X	
Calypogeia muelleriana	X	
Cephalozia lunulifolia	X	
Lophocolea heterophylla	X	
Nowellia curvifolia		X
Pallavicinia lyellii		X
Pellia epiphylla	X	
Riccardia latifrons		X

Summer Foray Lichens. N = New County Record (for macrolichens only).
Macrolichens
Candelaria concolor
Cladonia caespiticia **N**
Cladonia cylindrica
Cladonia macilenta **N**
Flavoparmelia caperata
Hyperphyscia adglutinata **N**
Myelochroa aurulenta
Parmelia sulcata
Parmotrema reticulatum **N**
Phaeophyscia adiastola **N**
Phaeophyscia hirtella **N**
Phaeophyscia pusilloides **N**
Phaeophyscia rubropulchra
Physcia adscendens
Phycsia americana
Physcia millegrana
Physcia stellaris
Physciella chloantha **N**
Physciella melanchra **N**
Physconia detersa **N**
Punctelia rudecta
Punctelia subrudecta **N**
Ramalina americana **N**
Xanthomendoza ulophyllodes **N**
Xanthomendoza weberi **N**
Microlichens (Crustose)
Arthonia caesia
Caloplaca arenaria
Caloplaca feracissima
Caloplaca flavovirescens
Caloplaca holocarpa
Candelariella xanthostigma
Catillaria nigroclavata
Julella fallaciosa
Lecanora dispersa
Lepraria lobificans
Pertusaria pustulata
Pseudosagedia cestrensis
Pyrrhospora varians
Verrucaria nigrescens

Wanted (Alive)

Although it is fairly widely distributed across the cooler regions of North America, Europe and Asia, "luminous moss," also called "goblin's gold," or "cave moss," *Schistostega pennata* is a great rarity in Ohio, and is about as unique as a plant can be. The only species in its family (Schistostegaceae), luminous moss grows in deep dark crevices in mineral, usually acidic, soil in caves, banks, animal burrows, and upturned tree roots. It takes a prepared eye to find it, the trick being to catch sight of an eerie golden-green glow from "goblin's gold" deep hidden within a dark recess, best seen when sunlight enters at a steep angle around dawn or dusk. The glow is actually caused by a cat's eye-like reflection from special light-concentrating lens-like cells on the protonema.

A moss protonema is a threadlike stage in the life cycle that develops from the germination of a spore. The leafy gametophyte , i.e., what we'd normally call a "moss," develops from buds on the protonema. Normally, the protonema is a short-lived transition to the gametophyte, to which it gives a photosynthetic "jump start." By contrast, the *Schistostega* protonema is persistent and long-lived, an apparent adaptation for life in sheltered conditions where enhanced light-gathering capacity is required. (Our few other mosses with a persistent protonema, *Pogonatum pensylvanicum* in the Polytrichaceae and the tiny ephemeral moss genus *Ephemerum* in the Ephemeraceae do not live in the dark, but

are nonetheless required to augment their photosynthetic capabilities because they specialize in growing rapidly on open disturbed sites.) Another exceptional feature of the *Schistostega* protonema is that it sometimes produces fragmenting asexual reproductive structures (gemmae), 3-4 cells in length, that are sticky and have been observed attached to the legs of mites.

The *Schistostega* gametophyte too is a wonderful oddity. It's an acrocarp (cushion moss) consisting mostly of individual upright sterile shoots less than 1 cm tall, bearing, in two ranks, about a dozen leaves that are confluent at the base and decurrent. This gives the plant a somewhat feather-like appearance, the basis for the specific epithet *pennata*. Unlike some other notable gemmiferous cave-dwelling cryptogams such as the ferns *Vittaria appalachiana* (Appalachian gametophyte) and *Trichomanes intricatum* (weft fern), which only exist as weird little gametophytes, luminous moss indeed sometimes produces (nearly leafless) fertile stems, and then sporophytes. Interestingly the sporophyte has some features, including sticky spores and a tendency for the seta to continue elongating even after capsule dehiscence, that have been interpreted as possible indicators of arthropod-mediated spore dispersal.

I've seen this moss only once, a thrilling moment during the summer of 1975, when I had the privilege of taking a bryophyte ecology course in the Adirondacks from one of New York State's greatest naturalist educators, Edwin Ketchledge. "Ketch" led us to, and distributed small golden-crowned clumps of dirt from, a recess in a steep bank along the shore of Cranberry Lake, where SUNY College of Environmental Science and Forestry has a biology station. Here's a photo of a stem from that 35 year-old specimen.

A featherlike stem of *Schistostega*. Photo by Bob Klips

According to the updated *A Catalogue and Atlas of the Mosses of Ohio*, luminous moss is known from only two adjacent counties in the northeast: Portage and Geauga, and both are "square records," i.e., presently known only from literature reports. At least one of these reports, perhaps the earliest, and likely authored by the originator of both the county records, is a 1919 paper in *Ohio Journal of Science* by Edo Claassen entitled "Mosses of Several Ohio Counties" that summarizes "20 years (of) excursions (that were) undertaken now and then, mostly in Northern Ohio, to prepare a list of the moss flora of that part of the State." Claassen's list includes this tantalizing entry: "*Schistostega asmundacea*, Web. and Mohr. On the ground in cave; P." Here, "P" stands for "Portage," and *asmundacea* is a misspelling of

osmundacea, an early synonym for the species.

There's been a good deal of interest in Ohio caves lately, as a collaborative research team from Wittenberg University and ODNR, with USFWS funding, has conducted biotic surveys of them, mainly focusing on animals. Fortuitous media reports about their endeavors, available on-line, indicate that "the place" for caves in Portage County is Nelson Kennedy Ledges State Park in Garrettsville. There, sandstone cliff formations occur that are among the few outcrops in northern Ohio that weren't covered with soil and rock left by receding glaciers. Erosion wore away at the softer rock layers below the sandstone, causing large "slump blocks" to fall away, leaving more resistant layers to form ledges above.

I visited Nelson Ledges in mid-August in a brief but fruitless search for luminous moss. The place is beautiful, a jumble of rocks and shaded rock faces that indeed looks like (a) prime *Schistostega* habitat, and (b) a poor location to jog, especially at night.

Nelson Ledges is a jumble of rocks. Photo by Bob Klips

There's a good chance the goblins are still there at Nelson Ledges, hoarding their gold, and we just need to put in more time searching for them. Field trip, anyone?
- Bob Klips

CHEMICAL SPECIATION?
As a newcomer to lichenology, I approach the subject with all the hubris of a neophyte. My background is that of a laboratory scientist, specifically, microbiology. I have had years of experience at identifying and culturing bacteria, fungi, and even viruses. In addition, my outdoor avocation has been concerned with the appreciation of wild mushrooms and other macrofungi. I look to the appreciation of lichens as my "new frontier" and thought perhaps my background in the foregoing might be useful in commenting on something I have already noticed and that is the matter of what I will call "chemical speciation".

For that, look no further than the *Cladonia pyxidata* complex, a group of closely-related species that seem to be differentiated only by specific combinations of spot tests. The lichenologist does not have the luxury (nor the time!) to culture their specimens to see if the designated identifying characteristics hold true or whether they are merely expressions of the environment in which they are found. Would a *Cladonia grayi* specimen found growing in Scioto County still be identified the same if it were transported to and allowed to grow in Jefferson County? Is the unique expression of biochemical reactions characterizing this taxon stable or is it something influenced by the environment, i.e., the substrate on which it is growing?

Laboratory mycologists know that a given species of imperfect fungus will exhibit greatly divergent colonial morphologies depending on the biochemical formulation of the medium on which it is grown.

Small differences in nitrogen composition will result in quite obvious distinctions in appearance.

Certain characteristics in bacteria of course are determined by genetic composition which in turn might be influenced by viral transporters of the gene for that characteristic. The diphtheria bacillus will not produce its lethal toxin until it has been infected with a virus transporting the gene for its production from a toxigenic strain. Poisonous tree frogs used by Central and South American indigenous peoples as a source of poison for their hunting arrows have been found to lose their ability to produce these superficial toxins when they are reared in a terrarium or exhibited in a zoological setting. Something acquired from their normal environment has caused the frogs to produce and secrete these toxins; remove them from that environment and the ability to express the toxin is lost.

Medical microbiologists often cultivate pathogenic microorganisms on laboratory media enriched with sterile blood, usually human. The addition of the blood enhances the growth of fastidious isolates from the body. All well and good, but certain pathogenic fungi will exhibit the blood group of the type used for making the lab medium on which they were grown! This certainly is not a phenotypic expression from a genetic determinant.

So the question that arises in this neophyte's mind is, are the various biochemical subtleties currently being used to divide lichen taxa really based on inherent properties or acquired from environmental conditions?

I shall look forward to sharpening my I.D. skills and you may well look the same towards keeping my mouth closed in opining further about this latest chapter in the "splitters vs. lumpers" war ☺.
- Bob Burrell

Wanted (Alive)

***Phaeophyscia orbicularis* IN OHIO**

Prior to 1977 and 1978 the name *Phaeophyscia orbicularis* was used in a broad sense to include *Phaeophyscia adiastola, Phaeophyscia pusilloides,* and *Phaeophyscia rubropulchra,* among others (Esslinger 1977). The name, *Phaeophyscia orbicularis*, however, was retained as a distinct species, found mostly in the western and northern parts of North America (Esslinger 1978).

The only Ohio record for this *Phaeophyscia orbicularis* was based upon material collected by Paul Kaucher from The Wilderness (Edge of Appalachia Preserve) (Kercher and Snyder, 1982). Dr. Theodore L. Esslinger, North Dakota State University, identified this material as *Phaeophyscia orbicularis,* albeit, reluctantly (personal communication). No additional specimens have since been reported. At the present time, the status of *Phaeophyscia orbicularis* is unknown. It appears on "Ohio's Lichen Watch List" and may still be discovered.

Phaeophyscia orbicularis (Neck.) Moberg is a small gray-brown species forming irregular to rounded thalli with somewhat overlapping lobes and distinct, orbicular soralia on the upper surface (see the photo below). While similar to *Phaeophyscia adiastola,* that species has marginal soralia and is widespread in Ohio. Another common species, *Phaeophyscia pusilloides*, may be similar but its (mostly) greenish soralia are terminal on upturned lobe tips. Continue to be on the lookout for this species as it could turn up when least expected.

Phaeophyscia orbicularis. Specimen courtesy of Christopher Raithel, Department of Environmental Management, Rhode Island, Photo by Don G. Flenniken

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- Don G. Flenniken

AN UNUSUAL HORNWORT (*Notothylas orbicularis*)

This promised to be great fun, and it was. In mid-August a scientist who studies orchids invited fellow OMLA member Jeff Rose and me to accompany him to see "three birds" orchid at Dawes Arboretum in Licking County. Seeing the orchid growing right alongside the trail was great, even if it is a mere vascular plant. Afterwards we continued hiking through the woods, and saw that the path continued along the edge of the woods bordering a soybean field. Back story: The previous weekend, Jeff and I participated in a bio-blitz where, as usual, that young whippersnapper kept scooping me by spotting cool plants that I had just walked past or even stepped on. Eager to regain a little botanical credibility, I was thrilled to see a wee little moss on the path just where it exited the woods. Hands-and-knees scrutiny revealed the moss to be one of the exciting short-lived annual mosses generally called "fall ephemerals." This one, *Aphanorrhegma serratum* (Funariaceae) turned out not to be a county record, but it is nonetheless fairly uncommon, or at least infrequently noticed. I was pumped!

Yes, pumped was I, for about two entire minutes. Jeff's "plant-dar" was set to "high." He wandered off toward the soybeans and immediately came back holding a little green-topped dirt ball, innocently asking "Can this be this one of those non-*Phaeoceros*, non-*Anthoceros* hornworts that have a tiny sideways sporophyte instead of an upright horn-like one?" The answer, which was "yes," raised another question: How *does* he do that? The answer to that latter question might involve comparing the visual acuity of someone born during, say, the Clinton Administration compared with someone born during the Truman one. Thank goodness for hand-lenses!

This is a picture of Jeff's great find, a hornwort called *Notothylas orbicularis*. Hornworts comprise one of the three plant divisions that are collectively, but informally, referred to as "bryophytes." The "bryophyte" designation is informal because it is now generally accepted that

they do not have a common ancestor that is not also shared with another plant group. The other "bryophyte" divisions are the mosses (Division Bryophyta with just over 400 species in Ohio), and the liverworts (Division Marchantiophyta with approximately 125 species in Ohio.) Hornworts, Division Anthocerotophyta, are a relatively small group that is mainly tropical. Ohio is home to just three hornwort species.

Notothylas orbicularis Photo by Bob Klips

In the photo below, labels denote the short spindle-shaped sporophytes, laying sideways in characteristic *Notothylas* fashion. Actually, what we see here are the cylindrical "involucres," collar-like tubes on the gametophyte within which the sporophytes are developing, and from which they will soon project, but just a bit. See also two mosses: (1) a "fruiting" individual of the fall ephemeral *Aphanorrhegma serratum* (big whoop!) and (2) some species of *Amblystegium*.

Notothylas orbicularis Photo by Bob Klips

Hornworts are small, flat, relatively featureless plants that, when lacking sporophytes, are readily mistaken for liverworts. Our hornworts, while infrequently observed, are sometimes abundant and may indeed not be especially rare, but just overlooked. Hornwort habitats are nothing special. Ours are all found on moist disturbed open soil, where they can be almost weedy. They engage in an interesting mutualism, harboring colonies of nitrogen-fixing bacteria within special cavities in their body.

A hornwort more deserving of the name, and the species that is much more frequently encountered in our region, is *Phaeoceros laevis*. Here's a picture of *Phaeoceros* taken in October a few years ago in Hocking County. Note the spike-like capsules that elongate from the base (a very unusual manner of growth for a plant, as plants usually lengthen only by adding cells at the tip) and split at the end, releasing yellow spores.

Phaeoceros laevis Photo by Bob Klips

Note: A version of this article originally appeared on line at http://ohioflora.blogspot.com/2010/08/small-flat-and-featureless-notothylas.html
- Bob Klips

CEMETERY LICHENS

Cemeteries can be interesting places, not only for the history that they contain, but also for the biology. Older headstones made of sandstone or marble, and their bases, are frequently encrusted with lichens. But not just any lichens; there is a group of species that is consistently found in this habitat. The usual substrate for these lichens is soft-barked trees like ash, walnut and sometimes maple and old sycamore, but with civilization they have found a new home in cemeteries.

This group includes *Phaeophyscia* species, primarily *P. decolor* and *P. rubropulchra*, *Physcia adscendens*, the ubiquitous *Physcia millegrana*, *Physciella chloantha*, *Physconia* species, and *Xanthomendoza* species. These lichens are typically nitrophilous and prefer basic substrates. With the exception of *Physcia millegrana*, they are rarely found on the harder, more acidic bark of oaks and hickories. Most of these lichens have a circumpolar distribution and in Europe, where this group is used as an indicator of eutrophication, it is called the *Xanthorion complex.*

Physcia adscendens, a common cemetery lichen. Photo by Ray Showman

In Ohio, this community is found in cemeteries throughout the state. These lichens are also sometimes found on trees in the relatively flat Huron-Erie Lake Plains and Till Plains regions but are rarer on bark in the Appalachian Plateau physiographic region. This may be the result of agricultural eutrophication of trees in the former areas, but may also reflect the distribution of substrate tree species in the different Ohio regions.

Xanthomendoza is another common cemetery species. Photo by Ray Showman

So the next time you visit a cemetery, take a look at the older headstones and see if you can find some of these cemetery lichens. - **Ray Showman**

But me the man of science and of taste,
Sees wealth far richer in the world of waste;
Where bits of lichens and a sprig of moss,
Will all the raptures of his mind engross;
And bright-winged insects on the flowers may,
Shine pearls too wealthy to cast away.
from Shadows of Taste by John Clare,
page 137

WHAT MOSS IS THIS?
Part 2 - Tips for Making Microscope Slides for the Examination of mostly Acrocarpous Mosses
Part 1 in Dec. 2009 Obelisk: http://www.ohiomosslichen.org/newsletter.html)

Equipment needed, in addition to the equipment mentioned in part 1:

- To make thin cross-sections, double-edged razor blades are often recommended because they are usually thinner and sharper than single-edged razor blades. Double-edged blades may be broken in half for use by using pliers, or if they are securely wrapped in paper using fingers pressing one edge at a shallow angle against a flat surface, and bending the blade until it breaks They must be held carefully to avoid finger cuts in use. A fine diamond hone (see carpenter supply houses) can be used to sharpen even new razor blades and especially single edged blades for finer cuts. Making cuts on a small piece of wood will preserve the edge longer than a glass slide.
- One of the cross-section methods described below uses a large thick needle with longitudinal scoring on the needle created with coarse sandpaper.[1]
- Dyes used for *Sphagnum* staining include gentian violet, crystal violet, or methylene blue.

Dissecting scope examination of acrocarps (mostly erect, unbranched mosses**):** Many mosses of this group can be identified to genus easily by looking at whole plants. *Buxbaumia* has large, uniquely shaped, asymmetrical capsules and is essentially leafless. *Sphagnum* has fascicles (clusters of branches) attached to the stem. *Rhodobryum* has leaves in a tight rosette at the stem apex. There are only 4 genera with **distichous leaves** (leaves exactly opposite on the stem) (*Distichium, Fissidens, Schistostega, and Bryoxiphiu*m); these are easily recognizable from the drawings in moss floras. *Leucobryum,* and *Octoblepharum,* that is found in the deep South, have a costa that fills the upper part of the leaf and is two or more cells thick. Some mosses have lamellae, filaments, or obvious ridges on the costa. Also notice if the dry plant is curled or contorted. These things are all clues in the mystery of "What moss is this?"

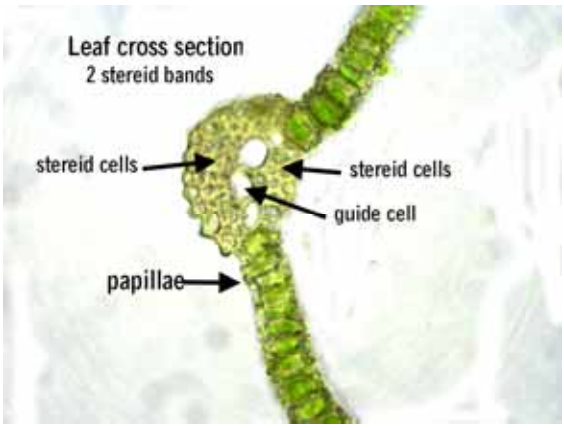
To prepare a slide for the compound scope place several plants in a drop of water on a slide. Notice any obvious differences in the shape of the plants or in the appearance of the leaves when the moss is moist compared to when it was dry. Some julaceous mosses will no longer appear worm-like when water is added. Remove some leaves from the stem and lay them flat to make leaf cells, costa and other features easily visible. Some additional dissection must be done for the following groups of mosses:

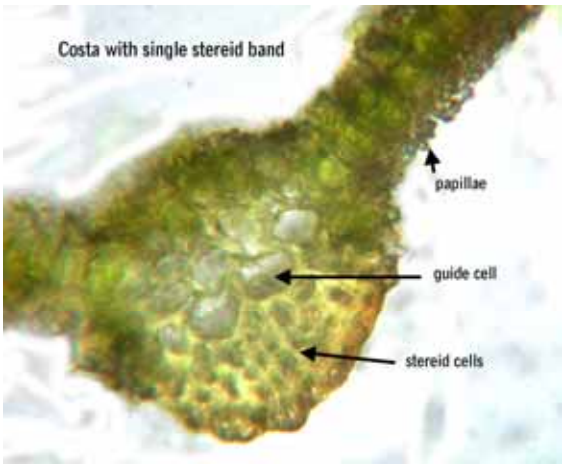
a. ***Fissidens*** has an extra flap of leaf clasping the stem, called the **vaginant lamina**. Cross-sections of the leaf must be made to confirm identification of several species (such as *F. taxifolius*) to check for papillae on the **vaginant lamina**. Other species have bistratose areas on their leaves which are easily recognized in a leaf cross-section; they can also be seen by careful focusing up and down on darker areas of the leaves. The *Fissidens* key in

Volume 27 of the Flora of North America uses the number of **guide cells** (large thin-walled cells) in the costa to separate groups of species.

b. Mosses with **lamellae** (long flat strips of cells running down the costa), *Atrichum, Polytrichum, Pogonatum, and Polytrichastrum,* should have leaf cross sections made. *Atrichum crispum* may be confused with *Mnium* since *A. crispum* only has a few **lamellae** that may not be continuous down the costa. With experience, these can be detected on a whole leaf by careful examination with a hand lens or dissecting scope. *Atrichum* species are separated, in part, on the number of lamellae growing from the costa and the number of cells that make up the height of the lamellae. *Polytrichum, Polytrichastrum,* and *Pogonatum* species differ in the shape of the cells on the top edge of the lamellae. To observe these characters, make leaf cross-sections first, and then scrape some of the lamellae off into a drop of water using the edge of the razor blade as a scraper. Then the lamellae can be seen in both cross-section and side view. In addition, cross-sections of some of the *Mniums* are useful to see if they have **bistratose cell margins** as well as to ensure that the moss is not *Atrichum crispum.*

c. The **Pottiaceae** and many other genera should all have leaf and often stem cross-sections made to check for **stereid bands** (groups of thick walled cells in the costa) and **central strands** (small cells in the center of the stem). The cross-section of a costa may have one or two bands of stereid cells, in addition to **guide cells** (large thin walled cells) that separate the stereid bands of cells (p. 332, Fig 151E [2]) or are positioned next to a single band of stereids (p. 276, Fig. 121D [2;]). See photos of stereid bands below.





d. ***Sphagnum*** mosses in general should be dyed to make some of the features such as pores and fibrils in the hyaline cells readily apparent. The whole plant may be put in a container with diluted dye for a minute, then removed and put on a slide where the parts that need dissection can be separated. There are two kinds of branches in the fascicles; transverse branches that grow out away from the stem and descending branches that lie very close to the stem. It is useful to count the number of descending branches in a fascicle, since the number of each are mentioned in the species descriptions, and may be significant in the keys. Some species are distinguished on whether the number of descending branches per fascicle is one or two. *Sphagnum* slide preparation requires two slides (or one slide with two cover slips), the first slide of stem dissections, showing stem cross-sections, stem leaves, and scrapings of the surface cells on the stem. The second should have branch dissections, with branch leaves, branch leaf cross-sections and branches. These two slides will have all the pieces and parts to observe to identify the species. With experience, shortcuts in dissection can be made. For instance, *Sphagnum fimbriatum* has a unique stem leaf and can be identified in the field with careful dissection and a hand lens, especially if the kind of purple water color pencil that releases its color readily to a wet surface is used to stain the leaf.

Compound scope examination: For all acrocarps look at leaves and determine leaf size and shape, cell shape, alar cell shape, costa type and length, papillae presence or absence, brood bodies and their type and position, and hyaline (clear) cell areas and shape on the leaf. **Papillae** can be easily seen in leaf cross-sections; c-shaped papillae can easily seen by focusing up and down with 400X in the compound scope.

Making cross sections: Cross-sections are often required for positive determination of a genus or species for both acrocarps and pleurocarps. There are several techniques to use. Moisten the material and place it on a dry section of the slide. **Always use a dissecting scope to make cross-sections.** Two or three leaves may be stacked in a pile, to increase the efficiency and get several cross-sections with each cut. *Sphagum* branch leaf cross-sections are most efficiently made by taking some of the longer branches from the **capitulum** (a "head" or cluster of young short branches at the tip of the stem) and making cross-sections of the entire branches. A similar procedure may be used on tiny acrocarps; this procedure may result in simultaneous stem cross-sections as well as leaves. Relax and take a deep breath before your first cut. And remember practice helps. *Polytrichum* cross-sections are good ones to start with.
a. **Finger method**: If the material is large enough (leaf or stem) and your finger nails are not too long or too short, it can be held down on the slide with a forefinger with the fingernail almost touching it; then using the nail as a guide for the razor blade make the first cut. Rock the finger back slightly on the fingertip which moves the

nail back slightly exposing a bit more material and make a second cut. Repeat this motion making successive cuts. Use the edge of the blade to move the cross-sections into a drop of water and tip the blade into the drop to rinse off any sections adhering to the blade.

b. Chop method: Hold the material down on a slide with forceps or another slide and make repetitive cuts to make cross-sections. Hopefully some of these will be of suitable thickness.

c. Fat needle method: Hold the material down with the large needle mentioned in the equipment section. This method works well for tiny leaves. The first cut will be parallel to the far side of the needle. Position the razor blade perpendicular to the leaf and next to the needle tip of the needle, and make your first cut. Then rotate the needle slightly toward you so a little more material is exposed keeping steady pressure on the material with the needle. Make a second cut next to the needle. Repeat until the desired cross-sections are made. Practice is needed to ensure that the material is always under some pressure from the needle so it will not slip out from under the needle.

Most of the **pleurocarps** (branching, mat forming mosses) don't need cross sections. But there are a few where stem cross-sections make identification possible. Some of these mosses have a stem with a **hyalodermis.** This is a stem whose outer layer of cells are large and thin-walled and clear (see p. 979 Fig 475B [2]); most mosses have small thick-walled cells in the outer layer. There are two groups of mosses where routinely made cross-sections are needed for accurate identification cross-section, and may be necessary for the process of identification; these are the genus *Hypnum* and **complanate** (flattened in one plane) mosses. One *Hypnum* key[2] suggests that these hyaline cells can be most easily seen at the base of a leaf where they are stripped from the stem. But *Hypnum curvifolium*, which does not have a hyalodermis, often shows what appear to be clear cells attached to the base of leaf! This tissue is probably just the top half of the stem surface cells and thus appears hyaline. So I recommend always making a cross-section for *Hypnum*.

The best place to make **stem cross-sections** is near the tip of the stem for both acrocarps and pleurocarps. Older (often more beat up) bits of stem may not show the clear thin walled cells of a **hyalodermis** but only a scalloped edge where the outer walls of cells have been worn away (p. 1152, Fig 567D [2]). Some cross-sections may be confusing because the cells of a leaf base may be attached to the cross-section and may appear to be a hyalodermis. Several cross-sections need to be checked.

Axillary hairs may be another feature that you will notice during careful observation. These are often seen on stems from which the leaves have been carefully removed, especially at stem tips, or attached to the base of detached leaves. These are fine filaments of 3 to 7 cells, usually hyaline, often with the basal cell that is brown or some other color. Some bryologists are beginning to use these in keys and descriptions.

Brood bodies are known by many names: brood branches, gemmae, bulbils, underground tubers, reduced branches, **propagula** (special name for brood bodies), or deciduous leaf tips. All of these may generate a new plant asexually from the parent plant. They may grow on leaves, in leaf axils, on stems, or on rhizoids; and their shape, general appearance, and growth site is often species-specific. They can sometimes be seen with a hand lens or dissecting scope on the whole plant. It is exciting to find and recognize brood bodies since they can really help with naming your moss.

Any of the odd papillae or brood bodies or other unique features help answer our mystery question, "What moss is this?" The real mystery is how to handle mosses that have no unique features. Well written **keys** will answer this question, especially once you know what the author of the keys means in each couplet. (With a large complicated key, I make an index of genus versus couplet number(s) where the genus is found. So, if I know what the moss is, I can work backwards through the key and learn what words the author chooses to arrive at a particular genus. Ah hah, now I can make the key work for another specimen of that genus!

1. Kellman K.,"A Newly Designed dissection Needle for Making Transverse Leaf Sections", Evansia. Vol. 22, No. 4, 2005.
2. Crum, H. A. & Anderson, L. E., "Mosses of Eastern North America", 1981.

- Diane Lucas

MOSS MUSINGS

Bryophytes and Birds

I confess. I have two passions (obsessions?): bryophytes and birds. Seldom is one lucky enough to combine passions. I had that opportunity when Carolina chickadees used bryophytes to build nests in a bluebird house in our yard. The use of mosses in nest construction is not a new observation. According to Baicich and Harrison, in *Nests, Eggs and Nestlings of North American Birds*, 105 of 672 birds included mosses in their nests. Fellow OMLA member, Susan (Moyle) Studlar, in study published in 1976 in *The Bryologist* 79: 95-98, found 65 bryophyte species in the nests of 11different species of birds. Bryophyte-utilizing nest builders include worm-eating warblers, Kirtland's warblers, cedar waxwings, and eastern towhees. Hummingbirds are known to use lichens in nest construction. Frequently the bird is identified, but the bryophytes and lichens are not.

Carolina chickadees are cavity nesters and use mosses, fibrous bark, dry grasses, feathers, and animal hair to build their nests. Nest construction begins in late March - early April, and fledglings take off in late May - early June. There are numerous videos on the internet that show Carolina chickadees building nests, hatching eggs, and feeding chicks.

In 2007 and 2008 Carolina chickadees used a bluebird house in our yard as a nesting site. The house was located in a small clearing within an 80-year old Appalachian oak forest. Each year, after the young fledged, I tore apart the nests, and determined all of its components. I had help from Ray Showman, who identified the lichens, and Tim Matson, who identified the animal hair.

Chickadee nest Photo by Diane Lucas

The nests occupied the floor of the nest box to a depth of about 1 3/4 inches. The 2007 nest weighed about 1 ounce, and in 2008, 1.2 ounces. The nests were made up of bryophytes, hardwood inner bark and raccoon hair. The 2007 nest was 55% (by volume) bryophytes (*Frullania eboracensis*, *Platygyrium repens* and others), and the 2008 nest was 70.4% bryophytes. For a more detailed

breakdown of the nest components, see *Evansia* 27(1): 23-29.

Other bryophytes present included *Porella platyphylla, Bryoandersonia illecebra, Dicranum montanum, Entodon seductrix, Haplohymenium triste, Leskea gracilescens, Orthotrichum ohioense, Platydictya subtilis, Pylaisiadelpha tenuirostris*, and *Sematophyllum adnatum*. Lichen species included *Myelochroa aurulenta, Phaeophyscia adiastola, Phaeophyscia rubropulchra, Physcia millegrana*, and *Punctelia subrudecta*.

With the exception of *Bryoandersonia illecebra*, which was present as a single piece in the 2007 nest, all the bryophytes are corticolous (either on bases or bark of trees). The chickadees pulled strands of pleurocarpous mosses and *Frullania* off bark in fragments measuring less than a half-inch in length. The acrocarpous mosses, *Orthotrichum ohioense* and *Dicranum montanum*, were removed as tiny tufts. For anyone who has collected *Frullania eboracensis*, you know how much effort was made by these birds to obtain enough fragments to build their nests. Sometimes bark fragments were attached, and the lichens were inadvertently collected with the bryophytes.

What surprised me the apparent selectivity of the chickadees. Other corticolous bryophytes were available, including *Anomodon attenuatus, Brachythecium laetum, Clasmatodon parvulus, Hypnum pallescens*, and *Ulota crispa*, but none was used in nest construction. There were many other bryophytes more easily collectible from sandstone rocks and decorticated logs. These chickadees preferred *Platygyrium repens* and *Frullania eboracensis*.

I have nests from 2009 and 2010, and intend to continue this project to see if nest composition changes. – **Barb Andreas**

NEVER TOO OLD TO LEARN – My Summer as an Intern at the New York Botanical Garden

Every now and then an opportunity comes along that I can't refuse. I received that opportunity this past summer when I was invited to be an intern at the New York Botanical Garden. I worked for Dr. William R. Buck on the bryoflora of the Cape Horn Region of Chile. Needless to say, I was the oldest intern (by decades) in the summer class of 2010.

My summer assignment was to work with southern South American species of *Blindia* (Seligeriaceae). *Blindia* is a genus of high elevations and/or high latitudes. *Blindia* is found on every continent except Antarctica, with major concentrations of species in Chile and the Australasian region.

In 1986, Bartlett and Vitt wrote a revision of the genus, identifying 16 species. This was my "bible", and I dissected it word by word, and used to it learn the species as represented in the New York Botanical Garden's William C. Steere Bryophyte Herbarium. The Steere Herbarium houses more than 640,000 specimens of bryophytes.

After being given a week to learn the species represented in the herbarium, I was given a box of "unknowns', collected by Bill during his numerous trips to the Cape Horn region. From my view, this box contained a mass of olive-brown to blackish-brown acrocarps that were all at once all alike, and yet at the same time had nothing in common except color.

By the end of the second week I recognized a *Blindia* from a non-*Blindia*, and had written a tentative key to the species of *Blindia* in southern South America. Posing as sterile "Blindias" were members of the genera *Ditrichum* (Ditrichaceae) and *Dicranoloma* (Dicranaceae).

By the end of the third week I had annotated all the material except 4 packets. Luckily, 3 of the 4 were fertile, and I could with confidence say that they were members of *Blindia*. The sterile packet closely resembled two of the others. So, I had three packets that were the same, and one different.

By the end of the fourth week, I had identified two un-named species in the genus. These are currently being described by me for publication. Diane Lucas is assisting by producing photomicrographs to accompany the article.

Although I am a trained vascular plant systematist, and have been identifying temperate mosses since the early 1990's, this internship gave me the opportunity to put the skills together. In fact, one could say that I am now a *Blindia* "expert".

The typical day began at 6:00 a.m. and ended between 3-4 p.m. I was assigned a study room near the herbarium, where I worked intensely each day. The only disruption was a half-hour break for lunch. I was truly honored to lunch with such botanical luminaries as Noel and Patricia Holmgren, Dick Harris, Scott Mori, Bill Buck and Barbara Thiers, among others.
- Barb Andreas

2010 FALL FORAY – MUSKINGUM COUNTY, OHIO

The 2010 Fall Foray was held in Muskingum County on Saturday, October 2 and Sunday, October 3. This county had been fairly undercollected with records for only 28 moss species, 4 liverwort species, and 52 macrolichens. Muskingum County lies in the unglaciated portion of Ohio with primarily Pennsylvanian bedrock.

Collections were made at several sites in and around THE WILDS and at two sites in the Blue Rock State Forest. Much of THE WILDS has been strip-mined and the land consists of reclaimed mine land presently covered with grass, unreclaimed mine land naturally re-forested, and remnant hardwood forests on unmined land. Some exposed rock outcrops were present, and consisted of sandstones, some with calcareous sands.

Habitat in the Blue Rock State Forest included natural mixed hardwood forest, a black walnut plantation and open trees, grass and bare soil around a fire tower.

Lichens recorded during the Foray included 47 macrolichens and 11 crustose species. Little is known about crustose species distribution in Ohio and all of the other crustose species are probably new for Muskingum County.

The macrolichen list includes 19 new county records. Several of these deserve note. *Myelochroa metarevoluta* is a seldom seen species with only three confirmed previous records for Ohio. *Physcia pumilior*, only recently reported from Ohio has been previously found in three counties. It should be present in other counties. *Xanthoparmelia tasmanica* has been found only once before, in Meigs County.

The collection of bryophytes during the Fall Foray was equally successful. There were 65 moss county records and 10 liverwort county records. On the foray, a total of 88 moss species were collected. With the addition of the previously collected *Bryhnia novae-angliae*, *Bryum lisae* var. *cuspidatum*, *Ceratodon purpureus*, and *Funaria hygrometrica*, the total number of mosses for Muskingum County is 92. *Frullania inflata* and *Porella platyphylla* were previously reported from Muskingum County. With this species and the 10 collected on the foray, the total liverworts for the county is 12 species.

Perhaps the best finds were *Fabronia ravenelii* (=*Fabronia ciliaris* var. *polycarpa*) collected by Barb Andreas, and *Ephemerum crassinervium*, collected by Bob Klips. This record is only the 5th county for the state. Bob has a knack of finding these small ephemerals (as well as corticolous specimens). *Fabronia ravenelii* has been found only once previously in Ohio, in Ross County. It has been reported from Kentucky, and states to the east and south.

The county records and the number of rarities for both lichens and bryophytes found in Muskingum County illustrate the value of Forays to undercollected counties. – **Ray Showman and Barb Andreas**

Lichens Recorded During the 2010 Fall Foray in Muskingum County. W = THE WILDS area; BR = Blue Rock State Forest.

Lichen Species	W	BR
Acarospora fuscata (C)	X	
Caloplaca feracissima (C)	X	X
C. flavovirescens (C)		X
Candelaria concolor	X	X
Canoparmelia crozalsiana **N**	X	X
Cladonia apodocarpa	X	
C. chlorophaea complex	X	X
C. coniocraea	X	X
C. cristatella		X
C. furcata	X	
C. macilenta **N**		X
C. ochrochlora **N**	X	X
C. peziziformis	X	
C. rei		X
C. squamosa	X	
Dermatocarpon luridum **N**	X	
Flavoparmelia baltimorensis **N**	X	
F. caperata	X	X
Graphis scripta (C)	X	
Heterodermia obscurata	X	
Hypocenomyce scalaris (C)		X
Hypogymnia physodes	X	
Hypotrachyna showmanii **N**	X	
Lecanora dispersa (C)	X	X
Lepraria incana (C)	X	
L. lobificans (C)	X	X
Leptogium dactylinum **N**	X	
Melanelixia subaurifera	X	X
Myelochroa aurulenta	X	X
M. galbina	X	X
M. metarevoluta **N**	X	
Parmelia sulcata	X	X
Parmelinopsis minarum **N**	X	X
Parmotrema chinense **N**	X	
P. hypotropum	X	X
P. margaritatum **N**		X
P. stuppeum	X	X
Peltigera canina	X	
P. evansiana **N**	X	
Phaeophyscia adiastola **N**	X	
P. hirsuta **N**	X	
P. pusilloides **N**	X	X
P. rubropulchra	X	X
Physcia adscendens	X	
P. americana	X	
P. millegrana	X	X
P. pumilior **N**	X	
P. stellaris	X	X
Physciella chloantha	X	
Physconia detersa	X	X
Porpidia albocaerulescens (C)	X	
Punctelia rudecta	X	X
P. subrudecta **N**	X	X
Pyrrhospora varians (C)	X	
Pyxine sorediata	X	X
Trapeliopsis flexuosa (C)		X
Usnea strigosa	X	X
Xanthoparmelia tasmanica **N**	X	
Total Species (58)	**51**	**32**

N = New County Record. (C) = Crustose Species.

Bryophytes Recorded During the 2010 Fall Foray in Muskingum County. W = THE WILDS area; BR = Blue Rock State Forest.

Species Name	W	BR
Mosses		
Amblystegium varium	X	X
Anomodon attenuatus	X	
Anomodon rostratus **N**	X	X
Aphanorrhegma serratum **N**	X	
Atrichum angustatum **N**	X	
Atrichum crispulum **N**	X	
Aulacomnium heterostichum **N**	X	
Aulacomnium palustre **N**	X	
Barbula unguiculata **N**	X	X
Brachythecium acuminatum **N**	X	
Brachythecium laetum **N**	X	X
Brachythecium plumosum **N**		X
Brachythecium rutabulum **N**	X	
Brachythecium salebrosum **N**	X	X
Brotherella recurvans **N**	X	
Bryhnia graminicolor **N**	X	
Bryoandersonia illecebra	X	X
Bryum argenteum	X	X
Bryum capillare **N**		X
Callicladium haldanianum **N**	X	
Camplyium chrysophyllum **N**	X	
Climacium americanum		X
Ctenidium molluscum **N**		X
Cyrto-hypnum pygmaeum **N**	X	
Dicranella heteromalla	X	
Dicranum flagellare **N**	X	
Dicranum fulvum **N**	X	X
Dicranum montanum **N**	X	X
Dicranum scoparium	X	X
Diphyscium foliosum **N**	X	
Ditrichum lineare **N**	X	
Ditrichum pallidum **N**	X	
Drepanocladus aduncus var. *kneiffii* **N**	X	
Entodon brevisetus **N**	X	
Entodon seductrix	X	X
Ephemerum crassinervium **N**	X	
Eurhynchium hians	X	X
Eurhynchium pulchellum	X	
Fabronia ravenelii **N**		
Fissidens bryoides **N**		X
Fissidens bushii **N**	X	
Fissidens dubius		X
Fissidens minutulus **N**	X	
Fissidens taxifolius	X	
Forsstroemia trichomitria	X	
Haplocladium microphyllum **N**	X	
Haplohymenium triste **N**		X
Hedwigia ciliata **N**	X	
Homomallium adnatum **N**	X	
Hygroamblystegium tenax	X	X
Hypnum curvifolium **N**	X	
Hypnum imponens **N**	X	
Hypnum lindbergii **N**	X	
Hypnum pallescens **N**	X	X
Isopterygium tenerum **N**	X	
Leptodictyum humile	X	
Leptodictyum riparium **N**	X	
Leskea gracilescens	X	
Leucobryum albidum **N**		X
Leucobryum glaucum **N**	X	
Orthotrichum ohioense **N**	X	
Orthotrichum pumilum **N**	X	
Orthotrichum pusillum **N**	X	X
Orthotrichum stellatum **N**		X
Plagiomnium ciliare **N**	X	
Plagiomnium cuspidatum	X	
Plagiomnium ellipticum **N**	X	
Plagiothecium cavifolium **N**	X	X
Pylaisiadelpha tenuirostris **N**	X	X
Platydictya confervoides	X	
Platydictya subtilis **N**	X	
Platygyrium repens	X	X
Pohlia nutans **N**	X	
Pohlia wahlenbergii **N**		X
Polytrichum juniperum **N**	X	
Polytrichum pallidisetum **N**		X
Polytrichum ohioense	X	
Rhizomnium punctatum **N**	X	
Rhynchostegium serrulatum	X	X
Schistidium rivulare **N**	X	
Sematophyllum adnatum **N**		X
Syntrichia papillosa **N**		X
Taxiphyllum deplanatum **N**		X
Taxiphyllum taxiraeum **N**	X	X
Thuidium delicatulum	X	
Thuidium recognitum **N**		X
Ulota crispa **N**	X	
Weissia controversa	X	X
Total Mosses (88)	**72**	**35**

Liverworts		
Calypogeia sullivantii **N**	X	
Cephaloziella rubella **N**	X	
Cololejeunea biddlecomiae **N**	X	
Frullania brittoniae **N**		X
Frullania eboracensis **N**	X	X
Lophocolea heterophylla **N**	X	
Nowellia curvifolia **N**	X	
Pallavicinia lyellii **N**	X	
Ptilidium pulcherrimum **N**	X	
Radula companata **N**	X	
Total Liverworts (10)	**9**	**2**

NEWS & NOTES

Thanks to all of our contributors for making this the biggest and best OBELISK yet! - **RES & JT**

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Forest Gump (in the movie Forest Gump, 1995) said that "life is like a box of chocolates – you never know what you're going to get." The same holds true when searching for lichens and bryophytes. You may see an orchid in bloom, an unusual butterfly or a baby box turtle.

Photo by Ray Showman

Baby box turtles are seldom seen; they spend the first few years of their life burrowing in the leaf litter in search of food and avoiding predators like crows and raccoons.

This unusual art is by M. C. Escher. More can be seen and purchased on the website: www.mcescher.com. Note the gigantic lichens and mosses in the lower left hand corner.

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The lichen poem can be sung to the words of 'She'll Be Commin' Round The Mountain'.

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The Ohio Moss and Lichen Association will be holding a Winter Meeting, Summer Foray and Fall Foray in 2011 but no dates have been set yet. We would welcome volunteers to plan either the Summer or Fall Foray. If you are interested, please contact Barb or Ray. Thanks everyone for your interest and participation!

Summer Foray participants (L to R): Bob Klips, Cynthia Dassler, Jeff Rose, Barb Andreas, Ray Showman, Janet Traub, Don Flenniken, Jim Toppin.

Fall Foray participants (L to R): Bob Klips, Zack Canter, Bill Schumacher, Jenise Bauman, Brian Gara, Carole Schumacher, Ed Fuchs, Jim Toppin, Barb Andreas, Cynthia Dassler, Jeff Rose, Diane Lucas, Cindy Fink, Ray Showman, Bob Burrell. Not pictured: Don Flenniken, Dave Smith. **(Both Photos by Bob Klips)**