OBELISK

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

Newsletter of the Ohio Moss and Lichen Association. Volume 11 No. 1. 2014.

Ray Showman and Janet Traub, Editors
ray.showman@gmail.com, j.traub@att.net

LEFT HAND CORNER
MAKE A DIFFERENCE

We do many things in our lives and most are important only to us. For instance, I love to travel and I have visited every state and 51 of the nation's 59 national parks. I consider this important, but it is really of no consequence to anyone else. A birder may travel hundreds of miles to catch a glimpse of a rare bird. Other than that person, who cares? A mountain climber trains for months or years to eventually scale a high peak. Does this really matter to anyone else?

In addition to our personal goals, we should look for opportunities for actions that make a difference on a larger scale. A great example is our own organization. Ten years ago, Barbara Andreas proposed starting a group of people interested in bryophytes and lichens. The goals of this group were to provide an opportunity to better learn these unique plants and to add to the knowledge of their distributions in Ohio. As we all know, Barb's idea was hugely successful and with her continuing hard work has grown into the Ohio Moss and Lichen Association.

Others have also joined the effort. Don Flenniken had the idea for a newsletter and started OBELISK, then single-handedly produced the first several issues. Bob Klips saw the need for a website and has since built one of the premier Ohio nature websites. The take home message is that we all should look for opportunities to make a difference on a larger scale than our own personal lives. **– Ray Showman**

***THUIDIUM DELICATULUM* var. *RADICANS* – NEW TO OHIO**

Thuidium delicatulum (Hedwig) Schimper var. *radicans* (Kindberg) H.A. Crum, Steere & L.E. Anderson [also referred to as *Thuidium philibertii* (Limpricht) Dixon] was found along a grassy ditch, near the intersection of Five Oaks and Sugar Maple Trails, in Slate Run Metro Park *(Andreas* 18104). It was growing mixed in with *Calliergonella lindbergii* (*Hypnum lindbergii*).

Thuidium delicatulum var. *radicans*
Photo by Bob Klips

Thuidium delicatulum var. *radicans* differs from the typical variety by having

stem leaves that end in a long tapered point of 1-seriate cells. In addition, the perichaetial leaf margins are usually not ciliate.

It is typically a calciphile, growing on soil, humus, or log, usually in wet places. It is widespread in the eastern United States, with the closest location in the neighboring state of Michigan (Flora of North America, Volume 28). It is widespread throughout northern North America, ranging from Alaska to Nova Scotia, south to Virginia, and west to Iowa. There is an outlier record from New Mexico.

It is always rewarding to find new county records on the OMLA forays, but it is even more exciting to discover a species new to Ohio. **– Barb Andreas**

2014 SUMMER FORAY, PICKAWAY COUNTY

The 2014 Summer Foray was held on June 14 at Slate Run Metro Park. Slate Run is located in the northeast corner of Pickaway County, one of Ohio's under-collected counties with 82 moss species and only 19 macrolichens reported. The area visited consists of young to mature deciduous forest with a rocky (glacial till) stream, trees in open mowed parkland and a buttonbush swamp. A photo of the Foray participants is located at the back of this issue.

The campground at A. W. Marion State Park and a cemetery in Circleville were also visited to augment the macrolichen flora of the county, listed below. A total of 27 species were recorded, including 15 new county records.

Pickaway County Lichens, 2014 Summer Foray. N = New County Record

Candelaria concolor
Canoparmelia crozalsiana **N**
Cladonia coniocraea **N**
Cladonia macilenta **N**
Flavoparmelia caperata
Flavopunctelia flaventior
Leptogium juniperinum **N**
Myelochroa aurulenta
Parmelia squarrosa **N**
Parmelia sulcata
Parmotrema hypotropum
Parmotrema reticulatum **N**
Phaeophyscia adiastola **N**
Phaeophyscia hirsuta **N**
Phaeophyscia rubropulchra
Phaeophyscia squarrosa **N**
Physcia americana **N**
Physcia millegrana
Physcia stellaris
Physciella chloantha **N**
Physconia detersa
Punctelia caseana **N**
Punctelia missouriensis **N**
Punctelia rudecta
Pyxine sorediata **N**
Pyxine subcinerea **N**
Xanthomendoza fallax

Twenty-five mosses and 8 liverworts new to the county were collected at Slate Run Metro Park. A new state record, *Thuidium delicatulum* var. *radicans* (see separate article in this issue of OBELISK) was also found. *Campylium radicale* (Andreas 18087), previously known from Ohio through literature citations was found growing on decomposing leaves at the edge of a buttonbush swamp. This is the first documented record for the Ohio Moss Atlas. In Volume 28, Flora of North America, this species is listed for Ohio

as *Pseudocampylium radicale*, but the location of that record is not known.

Pickaway County Bryophytes, 2014 Summer Foray. N = New County

Mosses

Amblystegium varium
Anomodon attenuatus
Anomodon minor
Anomodon rostratus
Atrichum angustatum
Barbula unguiculata
Brachythecium acuminatum
Brachythecium campestre
Brachythecium laetum
Brachythecium plumosum **N**
Brachythecium rotaeanum **N**
Brachythecium rutabulum
Brachythecium salebrosum
*Bryhnia novae-angliae***N**
Bryoandersonia illecebra **N**
Calliergonella lindbergii
Campylium chrysophyllum
Campylium radicale **N**
Ceratodon purpureus
Clasmatodon parvulus **N**
Ctenidium malacodes **N**
Dicranum montanum **N**
Dicranum viride **N**
Diphyscium foliosum
Ditrichum pusilum **N**
Entodon seductrix
Eurhynchium hians
Fissidens bryoides **N**
Grimmia pilifera **N**
Gymnostomum aeruginosum **N**
Haplocladium microphyllum
Haplohymenium triste **N**
Hedwigia ciliata
Hygroamblystegium tenax
Hyophila involuta **N**
Hypnum curvifolium
Leptodictyum riparium
Leskea gracilescens
Leucodon julaceus
Lindbergia brachyptera **N**
Orthotrichum ohioense
Orthotrichum pusillum
Orthotrichum stellatum
Orthotrichum sordidum **N**
Plagiomnium ciliare
Plagiomnium cuspidatum
Plagiomnium ellipticum **N**
Plagiothecium cavifolium
Plagiothecium denticulatum
Platygyrium repens
Polytrichastrum ohioense **N**
Polytrichum piliferum **N**
Pylaisiadelpha tenuirostris **N**
Rhizomnium punctatum
Rhynchostegium serrulatum
Schistidium apocarpum **N**
Sematophyllum adnatum **N**
Sematophyllum demissum **N**
Syntrichia papillosa
Taxiphyllum taxirameum
Thuidium delicatulum var. *radicans* **N**

Liverworts

Calypogeia muelleriana **N**
Cephalozia lunulifolia **N**
Cololejeunea biddlecomiae **N**
Frullania eboracensis **N**
Lophocolea heterophylla **N**
Nowellia curvifolia **N**
Porella playtyphylloidea
Riccia fluitans **N**
Scapania nemorea **N**

- Ray Showman and Barb Andreas

Found (Alive)!

XANTHOMENDOZA HASSEANA

I have not written a **Wanted (Alive)!** article on *Xanthomendoza hasseana*, the Poplar Sunburst Lichen, but it would certainly qualify. There are five old (late 1800's) records from scattered central and northern Ohio counties. There have been no records since then and it was thought to be extirpated.

However, last year I received an e-mail from Stanley Stine, a naturalist photographing and identifying lichens in the Twinsburg Park System in Summit County. He had found an interesting orange lichen, covered with apothecia. The lichen was found on aspen and he had tentatively identified it as the Poplar Sunburst Lichen.

Xanthomendoza hasseana. **Photo by Stanley Stein**

Details of *X. hasseana*. **Photo by Stanley Stein**

The numerous apothecia, absence of soredia, and presence of rhizines rather than hapters confirms that Stanley's identification is correct. This specimen remains growing in the park but Stanley later found other individuals, one of which was collected as a voucher specimen to officially verify the record. Nice work Stanley! **- Ray Showman**

SPICY FEMALES AND SLENDER MALES: SEXUAL DIMORPHISM IN LIVERWORTS

When you think of the term "sexual dimorphism," perhaps it invokes images of 16th century Italian masterpieces of man and woman, serpent and apple. It is unlikely that you imagine male and female *Marchantia*, *Sphaerocarpos* or *Solenostoma*. Yet, another (as if there aren't enough already) wondrous quality of liverworts is that some are sexually dimorphic.

Archegonia (female) and antheridia (male) of *Marchantia inflexa* growing in separate dishes side-by-side. **Photo by Linda Fuselier**

Liverworts, like many organisms with separate sexes, have sex chromosomes (think X and Y in humans) that are tied to primary sex characteristics. But, while the production of antheridia and archegonia (structures where sperm and eggs are produced) certainly constitute differences between sexes, it is the secondary characteristics that are the focus of sexual dimorphism. Secondary characteristics in liverworts are traits like size, color and hairiness that seemingly have nothing directly to do with the production of eggs or sperm. Liverworts that are sexually dimorphic in these secondary characteristics must also be dioicous (have sexes on separate

plants) rather than monoicous (with sexes on the same plant). It is when the sexes are separate that things get interesting. When plants are dioicous, the possibility for selection to act on females and males differently sets the stage for the evolution of sexual dimorphism.

When working on my dissertation, I surveyed literature to gather and categorize examples of sexual dimorphism in liverworts. Some general patterns emerged. Male and female liverworts may differ in their morphology, physiology and life history traits. Dioicous liverworts that are sexually dimorphic tend to have females that are larger than males and males with more red color and more branches than females. Usually, males put more energy into asexual reproduction than females, like in the production of gemmae cups as opposed to antheridia in *Marchantia*. In a patch of *M. inflexa* the females grow larger and may even overgrow the males, whereas males produce many more gemmae that presumably provide the male genotype an escape from female domination. The volumes of Schuster are replete with anecdotal examples of sexual dimorphism in liverworts. For example, he reports that *Lophozia capitata* males have fewer leaf lobes and are more slender than females, and in species of *Metzgeria*, females have hairier thalli than males, but *Diplophyllum taxifolium* females have longer leaves than their male counterparts. Several studies showed that in species of *Sphaerocarpos*, females have better germination success and are longer-lived than males and males are smaller and more red in color. Interestingly, Crum observed that females of *Conocephalum salebrosum* smell spicier than males.

Why these sex-specific traits exist is a question yet to be thoroughly answered. Are females usually larger because they have to do all the work of supporting developing sporophytes and the males do not? While it is fun to think of adaptive explanations for differences between the sexes, overall, we really need more research to support such conclusions.

Males invest in asexual reproduction as seen by this antheridium of *Marchantia inflexa* that is producing cupules on each of its antherdial lobes. **Photo by Linda Fuselier**

When you are in the field in Ohio staring at a patch of the lowly, common *Marchantia polymorpha* on a streamside rock, notice their sex structures and gemmae cups. Count them. Are both sexes living together on that rock? Which ones have gemmae cups? Which ones have sex structures? Do they have the same odor? What you discover will

tell you something about the ecology and secret life of the sexes.
- Linda Fuselier

Creation moves and astonishes if you let it. Dean Koontz in The City (2014)

THOSE WONDERFUL *CLADONIAS*

Members of the genus *Cladonia* are among the most showy and easily recognized of all the lichens. Reindeer lichens, pixie-cups and British soldiers are a few that are familiar to most people. *Cladonia* is a large genus of fruticose lichens with 142 species in North America and 35 found in Ohio.

British Soldiers, *Cladonia cristatella*, is easily recognized. **Photo by Ray Showman**

Cladonia is part of a special subset of fruticose lichens called cladiform lichens. These have two parts consisting of a primary thallus and a fruticose secondary thallus called a podetium (plural – podetia). The primary thallus starts first and is either crustose, or in the case of *Cladonia,* squamulose, composed of numerous squamules. These are tiny scales similar to a foliose lichen but without a lower cortex or rhizines. From these arise the upright podetia, which may be fine and abundantly branched as in the reindeer lichens, or may be stouter with a few or no branches. Podetia are frequently terminated by apothecia, the spore-producing organs of the fungal partner. The primary squamules may be very persistent, or in the case of the reindeer lichens, may soon disappear. A couple species consist only of the primary thallus with no podetia.

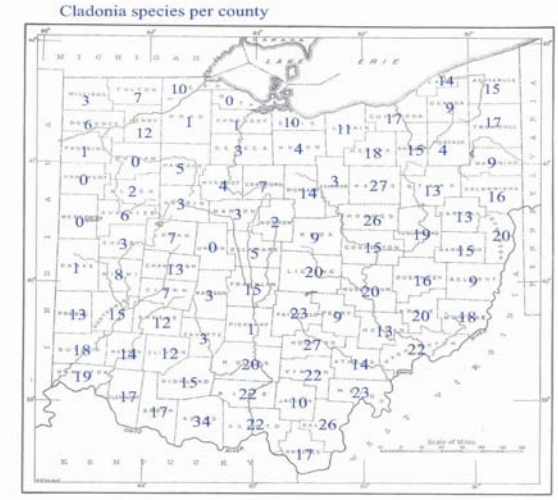
Stalkless Cladonia, *Cladonia apodocarpa* consists only of squamules and never forms podetia. **Photo by Bob Klips**

Pebbled Pixie-cup, *Cladonia pyxidata*, showing both podetia and primary squamules. **Photo by Bob Klips**

Some *Cladonia* species grow on bare soil but others prefer organic substrates like a rotting stump, fallen log, tree base or weathered board fence. I once found a discarded leather shoe covered with British Soldier lichens! Unreclaimed strip mine land provides great habitat for Cladonias, but thanks to strict

reclamation laws, this habitat has almost disappeared from Ohio.

The Turban Lichen, *Cladonia peziziformis*, is one of the many brown-fruited species**. Photo by Bob Klips**



Cladonias can be found across Ohio but are generally rare in the flat, heavily farmed 'Black Swamp' region of the state. The above map shows the number of species known from each county. There are 5 counties with zero reported species and 5 with only one species. On the other end of the scale, Adams County leads with 34 species, and many of the southeastern counties have over 20 species. **– Ray Showman**

FAVORITE FINDS AND HOPED-FORS IN 2014

Entodon cladorrhizans: fairly common in Ohio (51 county records out of 88 counties), but for some reason I never seemed to find it, although I often wondered if it was just my lack of understanding, less than keen observation, or inability to use the key. Entodons always turned out to be *E. seductrix* — until this year at a bioblitz at Raven Rocks Preserve in Belmont County. Not only did it key out very well, but the specimen looked almost exactly like the illustration in *Mosses of Eastern North America*, no imagination needed to decide on the bounds of variability between species. So that immediately made it a very memorable, if unremarkable, find!

Forsstroemia trichomitria: also found at Raven Rocks, my first *Forsstroemia*, a genus that always seemed intriguing because of *F. ohioensis*, which Drs. Crum and Anderson describe as "…of great rarity,… not found in Ohio since its original collection by Sullivant, in spite of many attempts made by bryologists, including special concerted searches…" So although *F. trichomitria* is no great rarity (in 19 of 88 counties, mostly in southern Ohio), it brings to mind that perhaps someday one of our forays will retrace Sullivant's footsteps and find *F. ohioensis* still there.

Bazzania trilobata: not a new find for me, but a favorite because it brings to mind Dr. Charles Arzeni and the wonderful week-long course he gave us in 1991. At the beginning of the course, Dr. Arzeni mentioned that we would know at least 50 species by the end of the week, which startled everyone

because it was so unbelievable — we hardly knew anything, and all mosses looked pretty much alike. But somehow he managed to blaze each species in our minds. I still remember exactly where he showed us *Bazzania*: on a conifer in a swampy area not far from the parking lot at Pyramid Point, Michigan. To this day, I can't say *Pleurozium schreberi* with an ordinary voice — I can only think of Dr. Arzeni's *Pleu_**RO**_zium **SCHRE**_beri* and his delight and the expression on his face when he said it. By the way, everyone did learn 50 species or more, and we had the time of our life. I'm sure that I never learned more in any one week before or since. What an amazing teacher!

Orthotrichum sordidum: not a lot of records for this one in Ohio (4 counties), and a surprise because, of the 10 Orthotricums in Ohio, it seems I always come up with *O. pumilum* or *O. ohioense*. This specimen gave the pleasure of keying out very well, down to the peristome teeth "cancellate at the tips" (a new term for me). Of course, *Orthotricum* is delightful because it always has capsules and is always pretty much at eye level. On the other hand, it's a good thing that not all mosses are at eye level — what would be the fun of a foray without crawling around in mud and poison ivy?

Melanelixia subaurifera: a memorable collection for several reasons. For one thing, it was one of my first attempts to collect and identify a lichen. I noticed a shiny, dark-brown (possibly dead?) lichen on the branch of an odd-looking dead tree. After much careful scraping to get some specimens off in one piece and catching back up with the group, the group leader mentioned that the lichen substrate was a well-known specimen of poison sumac. The good news is that if a poison sumac has been dead long enough, it is no longer poison. I ended up with a nice specimen, no rash and a reminder to think for a moment before handling an odd-looking tree, although seeing an intriguing specimen seems to crowd everything else out of mind.

Platydicta: a perennial hoped-for with me. I wonder how many times I must have walked by *Platydicta* without seeing or collecting it. All four species occur in Ohio, and it is no smaller than *Frullania eboracensis*, and how can anyone walk by that without seeing it? The search for *Platydicta* will probably be a source of great enjoyment next year.

Vesicularia: although there is no hope of finding this in Ohio (restricted to the tropics), perhaps one day I'll at least see it in a herbarium. How could you not be intrigued by what Drs. Crum and Anderson describe as "… a bad genus consisting of bad species "?

Scorpidium scorpioides: a hoped-for with one Ohio record. A few years ago, a collector from Michigan reported finding it at Kitty Todd Preserve in Lucas County, but the specimens were apparently lost and the collector has since died. I live in Lucas County and am often out in the field volunteering at Kitty Todd, so I'm always keeping my eye out for it, recalling that Dr. Arzeni showed us this one in a shallow, sandy pool not far from the shore of Lake Huron. There must have been pools like that here in our sandy Oak Openings of Lucas County, along the shores of the glacial lakes that preceded Lake Erie. Perhaps it is waiting to be found there in 2015. **– Jim Toppin**

Wanted (Alive)!

Bryoria furcellata, the Burred Horsehair Lichen, is a small, abundantly branched fruticose lichen found on bark or old wood. It is dark brown, smooth and shiny, with whitish soralia containing both soredia and isidia.

Bryoria furcellata **Photo by Jason Hollinger**

It has a Boreal/Appalachian distribution and has been recorded from 9, mainly eastern, counties in Ohio. This lichen is hard to spot due to its small size and dark color. I have seen it twice in Ohio, but not for around 20 years. Be on the lookout for it anywhere in the unglaciated part of the state.

- Ray Showman

***PLAGIOMNIUM CUSPIDATUUM* – THE FIRST MOSS RECORDED FROM ALL 88 OHIO COUNTIES**

It has been the mission of OMLA to plan forays to all Ohio counties, especially those that appear to be undercollected. To date, we have visited 22 counties. In fulfilling that goal, the distributions of common mosses are becoming more and more complete. In the 2012 OBELISK (pages 13-14), I reported that, through literature or herbarium records, *Plagiomnium cuspidatum* was known from 87 of the 88 Ohio counties. In October 2013, Diane Lucas and I traveled to Butler County where we collected *Plagiomnium cuspidatum*, making it the first species to be recorded from all 88 counties.

Now it is time to complete the distributions of a few other common Ohio mosses. These include *Amblystegium varium*, missing from Brown, Guernsey, Medina, Putnam, and Summit counties; *Anomodon attenuatus*, Brown, Logan and Montgomery; *Entodon seductrix*, Guernsey, Harrison, Miami, Montgomery, Noble, Seneca, and Williams; and *Platygyrium repens*, Brown, Carroll, Hancock, Logan, Montgomery, Noble, and Sandusky.

– Barb Andreas

BRYOPHILIA

There once was a gal with tattoos,
of mosses that she would choose,
to incise on her skin,
with the prick of a pin,
those images never to lose!

- Ray Showman

OEPA PROGRESS REPORT

In the last issue of OBELISK, the Ohio EPA wetland bryophyte project was briefly described. This is a project conducted in order to see if bryophytes can be used as indicators of wetland disturbance. This is a short update of that project.

This project is part of a larger project called the National Wetland Condition Assessment (NWCA), sponsored by the U.S. EPA, in which Ohio participated. For most states this was a one year commitment to obtain data points for a national assessment. However Ohio was one of several states that were provided a grant to extend the study in order to look at more wetlands (50 wetlands) in order to have enough data points for it to be able to make an appropriate statistical analysis for Ohio's wetlands. In this study, the vascular plant community, soil conditions, water quality, rapid assessments, and a buffer analysis were all looked at, in addition to the bryophyte community. Four field seasons of data collection were concluded this summer with all 50 sites now accounted for. Ohio EPA is in the process of going through the data and analyzing it. A full report is planned for next spring.

Regarding the bryophyte analysis, at this point bryophyte ID is complete for ~ 41 sites (this represents over 1700 envelopes and over 2400 specimens). A few trends can be noted so far. Three parameters: number of bryophyte species, number of bryophyte genera, and the moss Floristic Qualitative Assessment Index (FQAI) all show statically high correlations with both the wetland disturbance and the vascular plant community. If the above holds true, it may be possible to use bryophytes as an indicator of wetland disturbance. This would be useful, as at present the main indicator of disturbance – an index associated with the vascular plant community – can only be done during the growing season (June – September). However, the bryophytes do not have this limitation as they grow all year round. In addition, if the correlation with number of bryophyte genera holds up, that would increase potential acceptance of the use of bryophytes as an indicator, as a concern is the perceived difficulty that possible users have of identifying bryophytes. Identifying down to genera would be considerably less work than identifying down to species.

However at this point, we are busy trying to finish up the remaining sites. A more complete summary of the analysis will be provided for in the next issue of OBELISK.

– Bill Schumacher and Brian Gara

THE IMPORTANCE OF COMMON THINGS

Like many others I am intrigued by the rare and unusual. This is true in looking for and observing bryophytes as well as other aspects of life. However, recently I have been thinking of the importance of the "common". The common is what we usually observe and are often encountered. By stressing so much importance on the "rare," I am in danger of missing out on a both a lot of information and enjoyment that the common has to offer.

It is not that the rare is not important. Observing and documenting the rarer

species provides us with much information. However, it all too easy, to turn up one's nose in disdain at the common. It is the common in nature which provides us with the daily beauty we see – that provides context for our daily lives – and that invites us into the sublimity beauty that only nature can offer. In addition, much of that which is common has much information to provide, of which I only know a small amount. For example, how much do I know about the common species of mosses that I see every day? Actually beyond their names and where they live – very little.

The following excerpt from a poem written by Paul Dunbar, an early African-American poet, who was also a native Ohioan, puts into words, much of my "gut" feelings about the importance of the common.
- Bill Schumacher

Common Things (excerpt)
The nightingale is sweet of song;
The rare exotic smells divinely;
And knightly men who stride along,
The role heroic carry finely.
But then, upon the other hand,
Our minds have got a way of running
To things that aren't quite so grand,
Which, maybe, we are best in shunning.
For some of us still like to see
The poor man in his dwelling narrow,
The hollyhock, the bumblebee,
The meadow lark, and chirping sparrow.
We like the man who soars and sings
With high and lofty inspiration;
But he who sings of common things
Shall always share our admiration.

EASY TO LEARN!

There are a few of the lichens
that anyone can learn,
like the Common Greenshield,
it is easy to discern!

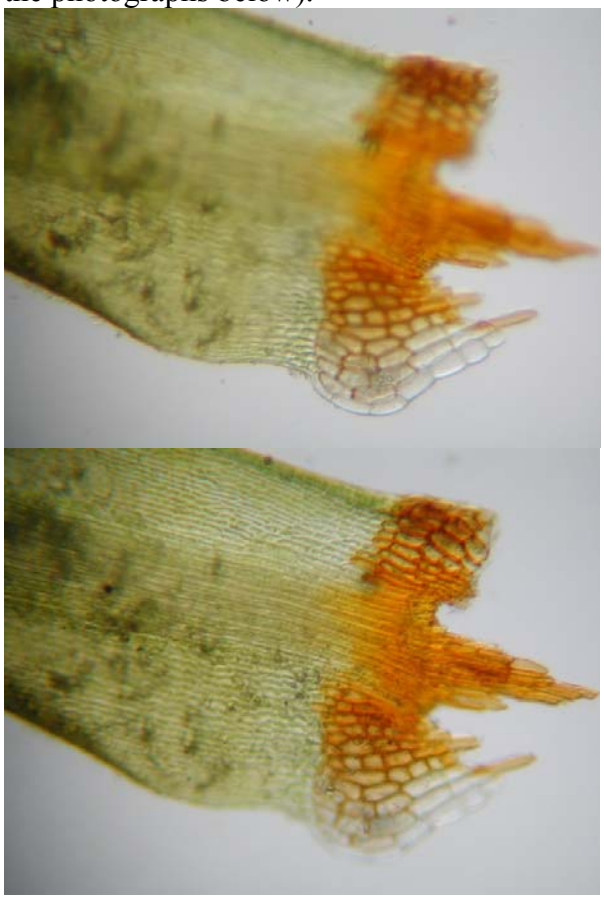
Its yellow-green is distinctive,
and it only grows on trees,
so once you see a few of these,
identifying is a breeze!

The Hammered Shield is another,
it has a distinctive look,
so learn the narrow hammered lobes,
and you'll never need the book!

Every lichen that you learn,
is another in your ID kit,
soon you'll know the common ones,
and it doesn't even hurt a bit!
- Ray Showman

THE MAGIC OF STACKING: WHAT IS IT, WHY DO IT, AND HOW TO DO IT

Several years ago my moss mentor, Barbara Andreas, was working on the genus *Blindia* from the southern tip of South America and was conjecturing about how to illustrate the article she was writing on this subject. In the past, drawings have been the accepted way to illustrate the fine details of plants and bryophytes in papers and flora. But it is difficult to show everything you see through a microscope in a drawing. And even when photographing something as flat as a moss leaf through the microscope it is impossible to get a sharp focus on all parts of the leaf (see the photographs below).



No matter how you try, it cannot be done without squashing or tearing part of the leaf to get it all in focus. The magic of stacking allows good sharpness in a single "stacked" photograph:

Alar cells of *Blindia serrata* from a stack of 6 pictures. Photo by Diane Lucas

I had been doing some casual "stacking" trials on pictures through a microscope, and I am not sure if I volunteered to take pictures of Barb's *Blindias*, or if she asked me. And so it began.

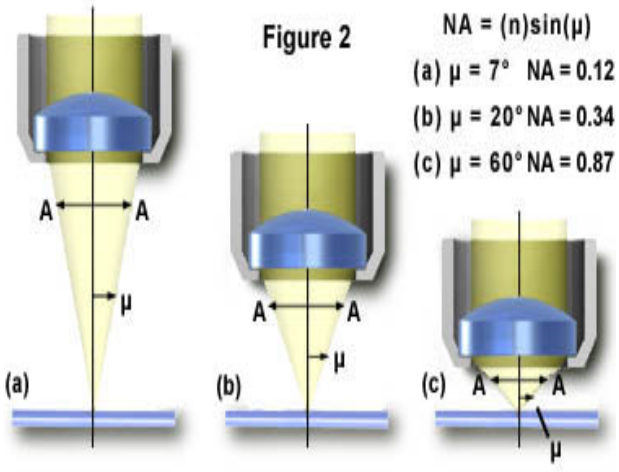
Stacking is the process of taking a series of shots from lowest sharp focus to highest sharp focus somewhere in the field of view, and then using software to combine the best parts of each picture in a single image.

I have a Nikon Coolpix 990 with 3.3 megapixel chip attached to my Olympus CH30 microscope using an inexpensive 10x eyepiece threaded to screw into the camera lens filter threads. The camera is set for taking pictures by turning off the flash, setting for infinity focus, and measuring white balance through the microscope. A second Nikon Coolpix is on my Meiji Techno RX stereoscope, which will zoom from 7.5x to 200x. It has both fine and coarse focus and I have a small LCD screen used for better focus. I used this to take pictures of capsules, entire plants, or whole leaves

of *Blindia* which were too large to photograph entirely in the compound scope.

Depth of field is the actual depth of sharply imaged portion of a real object, and is a very small distance in both micro- and macro-photography. Depth of Field in a microscope = $K/NA + \lambda/(NA)^{2}$. In this equation K is a factor of the magnification and the resolution of the eye, and λ is the wavelength of light. Numerical Aperture (NA) is the important factor, and increases as the sine of the angle of light entering the objective increases; NA equals the refractive index times the sine of the half angle of entry light; it is marked on all modern microscope objectives.

The diagram of three microscope objectives below shows the differences in the shape of the cone of light entering a low power objective on the left and a high power objective on the right. The size of the actual lenses is not correct since the diameter of the lens where light enters a high powered objective is very small (following two figures from http://www.microscopyu.com/).



The next figure shows the difference in depth of field between a low and high power objectives.

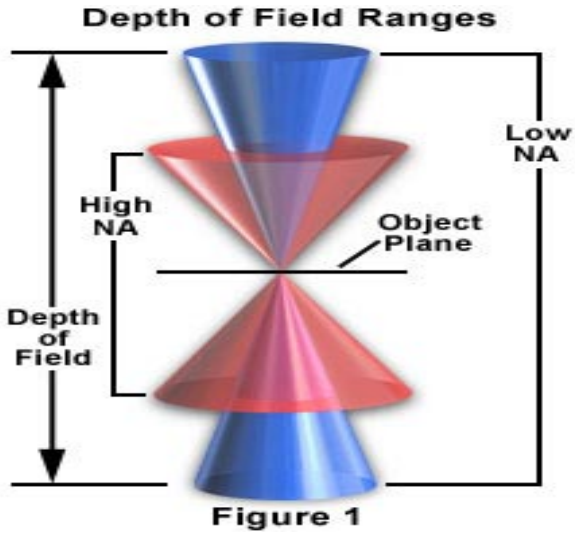


Figure 1

And this table shows the expected depth of field for typical microscope objectives.

Magnification	Numerical Aperture	Depth of Field (μm)
4x	0.10	50
10x	0.25	7.7
20x	0.40	2.9
40x	0.65	0.9
60x	0.85	0.36
100x	0.95	0.17

Stacking could not exist without the invention and development of two things:

- The invention of the digital camera which can take many pictures quickly.

- The development of software that not only aligns and resizes the "stack" of pictures, but also picks out the sharpest areas of each picture and then combines these into a final picture.

There are several programs available to do the stacking and all of these are available on the internet. Tutorials for these programs are also provided. CombineZP , Tufuse, and Picolay are free. There are two excellent programs

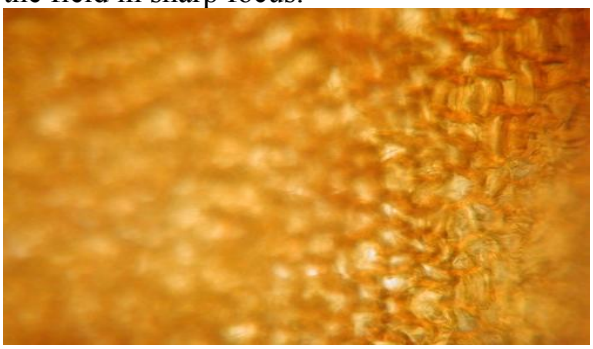
that each give you a 30 day free trial, before you are required to buy then for continued use. Both Helicon Focus and Zerene Stacker have several versions from amateur to professional for purchase. I started out using CombineZP but have switched to Zerene Stacker, which is used for the results in this article. Zerene Stacker has a very easy to use retouching ability which lets you take the desired detail from any picture in the stack and move it to the final picture.

The following pictures are from a stack of 11 shots of the capsule of *Blindia contecta;* the first picture shows only the center of capsule in sharp focus.

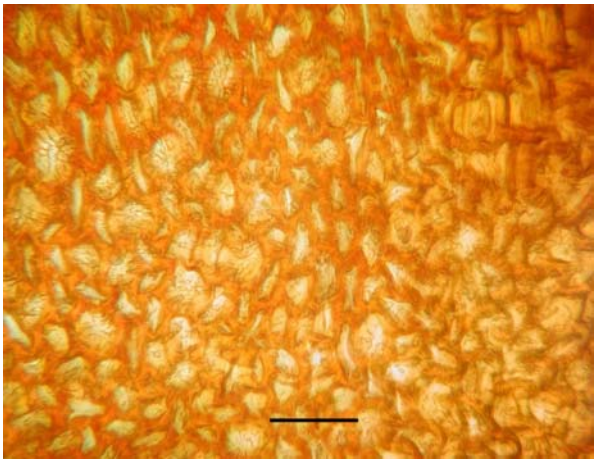
And the final picture in the stack shows the edge of the capsule in sharp focus.

And the final stacked result after clean up in Photoshop and adding a scale bar.

Another example is the exothecial cells on the surface of a *Blindia serrata* capsule after dissection so light can pass through the cells and show their detail. A single picture shows only a portion of the field in sharp focus.

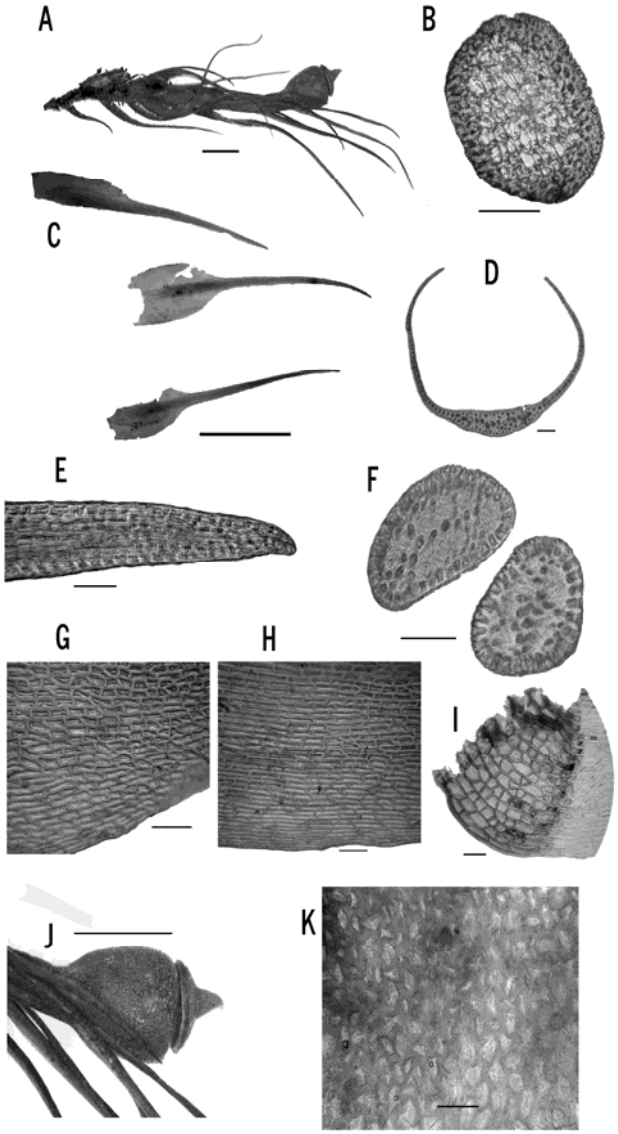


A series of 21 photos was stacked to obtain this result.



So from a series of photographs like these for the species of *Blindia* found in the Cape Horn archipelago, Photoshop

can be used to put together a final figure for publication. The figure for *Blindia contecta* is next and is ready for captions.



It took much longer to learn how to do this than to actually do it. First, making the slides to take the pictures takes more care than just to put a name on the moss. Even cross sections need greater care in making. With luck and good material, I could probably take all the pictures for one plate in a day. Then another day for stacking and perhaps retouching in the stacking software - and also deciding if the product was acceptable. Then Photoshop is used to adjust contrast, clean up the background, and prepare the scale bars from a picture of a precision slide with markings separated by 0.01 mm. Since I used the camera zoom control to frame the pictures, I had to remember to photograph the scale each time I changed the zoom setting. I also used Photoshop to convert to gray scale for publication, and to size and combine 10 to 12 pictures in a single figure and add the reference letters for each separate picture. So if I made no mistakes, and did not have to repeat any of the processes, I could prepare one figure for publication in 2 or 3 days. But since I am retired, I do not work 8 hour days any more.

Bob Klips uses the same kind of software to process the pictures he spends hours taking in the field. He can either change the focus of the camera slightly between shots, or move the

whole camera using the focusing rail to get his "stack."

- Canon MT-24-EX twin flash
- Canon 6D DSLR
- Canon MP-E 65mm 1-5x macro lens
- Manfrotto 454 focusing rail
- iPhone Wi-Fi used for cable release, also shows field of view

One of his pictures of a stack of 15:

Campylium chrysophyllum **Photo by Bob Klips**

Many talented stackers are out there and it is easy to see their results on the internet. One of my favorite sites which features their results and the equipment they use, is http://www.photomacrography.net/forum/. Beginners are always asking questions and the answers are very informative. But watching a fine image appear when the stacking program runs, is when the magic truly appears. So try it. - **Diane Lucas**

OLD LIMESTONE FENCE IS A HAVEN FOR CRYPTOGAMS

One of the nice things about pursuing cryptogams is that you don't need to go on an hours-long car ride to a vast wilderness in order to see wee things that are both exciting and beautiful. A case in point is a little 17 acre Columbus park with a difficult to pronounce French-sounding name located on the west bank of the Scioto River just south of Fissinger Road in the Hilliard suburb. Called Duranceau (or "Duranceaux") Park (bonjour!), it's got the typical city park's playground and picnic tables, plus a splendid new boathouse built expressly for rowing enthusiasts. For the bryophyte and lichen enthusiasts the park has shady moist limestone ledges, scattered mature trees, and picnic tables of an old-style concrete composition that turns out to be excellent lichen substrate. But perhaps the richest cryptogam habitat is also the easiest to overlook, a very old limestone fence separating the neighboring backyards from the park.

Old limestone wall abounds with cryptogams. **Photo by Bob Klips**

Lichens abound on the wall. One of the foliose ones is "hairy shadow lichen," *Phaeophyscia hirsuta* (synonym: *P. cernohorskyi*), a narrow-lobed species with a black undersurface, bearing distinctive cortical hairs on lobe tips. Note that Franklin County's bedrock was formed during the Devonian period of the Paleozoic era, 408-360 MYA, a time when shallow seas covered the region. As a result, this wall is adorned with fossils. In the image below, see how a brachiopod did some annoying "photo-bombing" while I snapped pictures of the lichen.

Hairy shadow lichen and brachiopod.
Photo by Bob Klips

One of the larger foliose lichens here is a "frost lichen," *Physconia detersa*. The frost lichens have a brown thallus which is heavily pruinose. ie., having a whitish powdery bloom on the surface. This particular specimen seems to be an unwilling participant in a game of "leapfrog" with a pesky sample of the narrow-lobed but very brightly colored "powdery sunburst lichen," *Xanthomendoza ulophyllodes*.

Frost, and powdery sunburst, lichens having fun. **Photo by Bob Klips**

To fully appreciate the lichen biota here, one needs to pore over the stones with a hand lens, savoring the less conspicuous crustose gems while simultaneously arousing the bemused curiosity of dog-walking passers-by along with the suspicions of residents in houses on the lots bordered by the fence. Going back to the show-off brachiopod, there are gray apothecia, most likely belonging to a very common species often seen on concrete and other calcareous rocks in urban areas, "mortar rim-lichen," *Lecanora dispersa*.

Rim lichen and brachiopod. **Photo by Bob Klips**

The "firedot" lichens, genus *Caloplaca*, are especially bright-colored, yellow or orange crustose species. Two species are especially eye-catching here on the wall. "Sidewalk firedot lichen," *C. ferracissima* produces abundant orange apothecia and, as its common name implies, is indeed common on sidewalks mortar, and cement, as well as on natural limestone.

Sidewalk firedot lichen. **Photo by Bob Klips**

Oh, no! Did vandals spray-paint part of the fence? Ah, what a relief; it's just a big patch of "mealy firedot lichen," *Caloplaca citrina*. This firedot is yellower than other *Caloplaca* species, and, consisting mainly of sorediate squamules with few or no apothecia, could be mistaken either for a peculiar form of "lemon lichen," *Candelaria concolor* var. *effusus* or, more likely, the annoyingly similar crustose one called "powdery goldspeck lichen," (*Candelariella efflorescens*). A chemical spot test quickly distinguishes this *Caloplaca* from its lookalikes in those other genera, as it turns bright red-purple upon contact with KOH.

Mealy firedot lichen. **Photo by Bob Klips**

"Frosted grain-spored lichen" *Sarcogyne regularis* is crustose, with nearly globose apothecia that are dark rimmed, topped by a pleasantly contrasting whitish pruinose central disk, the "hymenium" portion occupied by the spore-producing apothecia. The overall effect is suggestive of very, very small buckeyes.

Frosted grain-spored lichen. **Photo by Bob Klips**

Yes, there are mosses on the wall. "Cord glaze moss," *Entodon seductrix*, is an especially striking, albeit quite common, robust pleurocarp. One of our shiniest species, it has wormlike stems with broad leaves. This moss is quite common on logs, stumps, and wooden roofs as well as on rocks.

Cord glaze moss. **Photo by Bob Klips**

Phooey! Fooled again by "bear claw moss," *Barbula unguiculata*. While this acrocarp is most common in arable fields and gravel lots, from time to time it shows up on logs or soil in wooded areas. Add to that old limestone fences! Is this moss *everywhere*? Looking quite twisted, this specimen very effectively apes another member of the Pottiaceae, "tornado moss," genus *Tortella*.

Bear claw moss, dry, resembles tornado moss. **Photo by Bob Klips**

A microscope view clarifies the issue. Note both the characteristic stout claw-like apiculus at the tip of the leaf, along with smooth-walled clear cells that are confined to the base of the leaf, not extending up the margins as they do in tornado moss.

Bear claw moss leaf. **Photo by Bob Klips**

Having thus visited Limestone Fence National Park, there might still be time to explore a more natural rock ledge along the cove of the river.

Moist limestone ledge at Duranceau Park. **Photo by Bob Klips**

This is a great place to see a lush growth of three species of *Anomodon*, including the robust shelf-like "rounded tongue moss," *A. minor*.

Rounded tongue moss. **Photo by Bob Klips**

Maybe it's just a trick our mind plays on us, showing us patterns where there are none and then falling prey to what cognitive psychologists call "confirmation bias." But it seems to me that unrelated organisms with strikingly similar growth forms co-occur too often for it to be random. As an example, here on the ledge is a leafy liverwort bearing an uncanny resemblance to the *Anomodon* moss. It's a *Porella species*, here seen with a photo-bombing lichen, "common stippleback," *Dermatocarpon miniatum* (also known as *D. muhlenbergii*). This is a robust, centrally attached (umbilicate) foliose lichen that typically occurs on dry or moist, but not submerged, limestone (or sometimes acid) rocks.

Porella liverwort and stippleback lichen. **Photo by Bob Klips**

While trips far afield can be indeed be rewarding, an interest in bryophytes and lichens can be maintained by simply sometimes taking the scenic route home from work, and stopping of to explore our little municipal parks, highway, rest areas, and the like. Don't overlook small natural wonders close to home!
- Bob Klips

MOSS MUSINGS: EXPLORING THE CAPE HORN ARCHIPELAGO IN SEARCH OF *BLINDIA*

In the 2010 OBELISK ("Never Too Old To Learn,"Vol. 7, p. 19-20), I wrote about accepting a position as an intern at the New York Botanical Garden. As an intern, I was assigned to work on the genus *Blindia* (Seligeriaceae). Specifically, I was to go through

specimens labeled *Blindia* that were collected from the Chilean Cape Horn Archipelago. From those specimens, and additional ones collected during 2011, 2012, and 2013 trips to the region, I identified and named three species new to science: *Blindia buckii* B.K. Andreas, *B. rigida* B.K. Andreas, and *B. serrata* B.K. Andreas (*The Bryologist* 116(3): 263–280). Based this research, I was invited to participate in the 2014 expedition to the Cape Horn Archipelago. The expedition extended from January 4 to January 31, and it was an experience of a lifetime.

The Cape Horn Archipelago is an area of approximately 19,300 square miles, about half the area of Ohio. It is part of the UNESCO Cape Horn Biosphere Reserve, and has 5% of the world's bryophytes in only 0.01% of the world's land mass. There are approximately 450 mosses and 370 liverworts. In contrast, there are relatively few vascular plants (545 species).

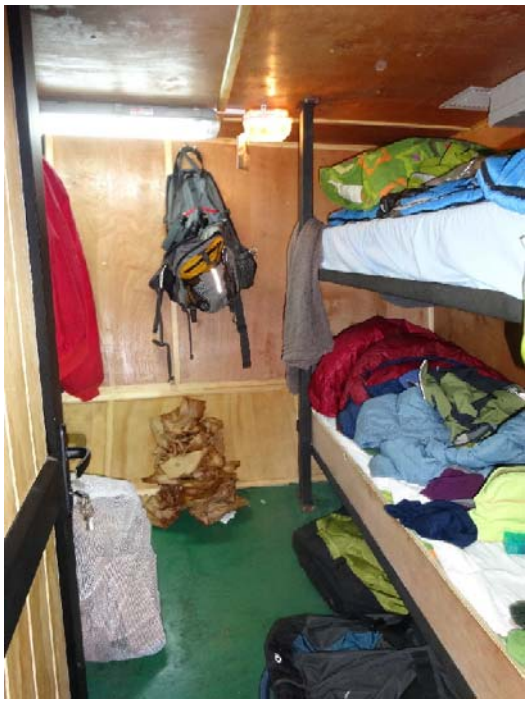
The National Science Foundation awarded funding to Dr. William Buck (New York Botanical Garden) and colleagues to explore the Cape Horn Reserve in search of additional bryophytes. The grant included funding for four field expeditions. On each expedition, Bill put together a group of bryologists that included specialists in a particular taxonomic group, and generalists. In addition to Bill and me, the 2014 group included Dr. Juan Larraín, Ernesto Davis (the local facilitator), and Rina Charlín, from Chile; Dr. Matt von Konrat and Laura Briscoe, from the Field Museum; Dr. John Brinda, from the Missouri Botanical Garden; and Dr. Barbara Murray, from Alaska.

After spending several months collecting gear for the expedition, I flew to Punta Arenas, capital of the Región de Magallanes y de la Antártica Chilena, situated along the Straits of Magellan. When I arrived, I discovered that only one of my two my carefully packed duffle bags followed me. Thankfully, there were several days of pre-trip preparation in Punta Arenas, during which I fretted. Finally, just four hours prior to boarding the ship, my duffle arrived at the airport.

Home away from home, the *Doña Pilar*.
Photo by Barb Andreas

We boarded the crabbing vessel, *Doña Pilar*. The ship was available because crabbing is a seasonal activity, and we were there during the off-season. The *Doña Pilar* is approximately 58 x 17 feet (about the size of a single-wide, two-bedroom manufactured home). We met the crew of four: the captain (Pato); the cook (Chacón); and two mates (Pedro and Juan Pablo). Eight of the 9 scientists slept in small compartments, each of which had a set of bunk beds. My compartment, shared with Barbara Murray, did not have supplemental heat, and some evenings the temperature reached as low as 50°F. I slept on top bunk and the space between the bed and the ceiling was such that I couldn't put my pillow upright, making turning over

difficult. The experience cured my claustrophobia.



Our compartment, with a day's collections piled on the floor. **Photo by Barb Andreas**

The 13 of us on board shared one bathroom (head). Thirteen was too much of a drag on the water tank so two things happened: 1) we took on "native water" by putting a hose into waterfalls and streams to fill the ship's storage tank, and 2) we flushed the toilet with water taken by bucket off the side of the ship. The "native" water, although supporting many microorganisms, did not contain pathogens that made us ill. In fact, everyone was in fine health throughout the expedition.

Rather than give a travelogue, I'll describe a typical day in the expedition. We awoke around 6:00 – 6:30 a.m. The compartments and the short hallway were dark, so I'd foolishly grab my flashlight, only to find that when I was on deck, the sun had been up for hours. In fact, it was daylight from about 5:00 a.m. to 10:00 p.m. We awoke most mornings to the smell of baking bread, to which we added butter, jam, or dulce de leche. The ship's coffee was Nescafé instant, and many of us brought our coffee of choice.

After breakfast, we went to the engine room to grab the life preservers and put on our field gear. Because of almost constant precipitation, we wore waterproof clothing, including insulated high boots and a hooded raincoat.

Barb in complete field gear.

We boarded a Zodiac and took off toward a collection site. Most times, the group scattered so that more of the collection locality would be sampled. Age made a difference – we older folks stayed at lower elevation while the younger members climbed to higher elevations and rougher terrain. Sometime around noon the Zodiac would return and take the first group back to the ship. We staggered returning to the ship so that we had more space in which to sort our collections.

While eating lunch, the ship would move to a new locality. Again, we boarded the Zodiac and went to the field. The final group boarded the ship around 6:00 p.m.

Either before or during dinner, the ship moved to find a quiet, safe harbor for the evening.

Most evenings, after anchoring, Matt and Laura set up microscopes on the galley table to photograph oil bodies in the cells of liverworts. John worked in the galley or his room entering records in a database, and Juan retreated to the noisy engine room to record and re-package specimens. The rest of us shared what space we could find to work on various phases of our collections. Most of us had a popular fiction book that we read in the "down" time, and several tried to have conversations with the crew in our very broken Spanish.

Matt and Laura photographing oil bodies. **Photo by Barb Andreas**

One of the holds had been converted to a "drying room," also called "the bodega". For earlier expeditions, racks had been built to hold our wet collection packets. Fans and lamps were placed under the racks in order to speed up the drying process. When seas permitted, each night the bodega was opened so that we could arrange our day's collections. Once the packets were fairly dried, we transferred them to laundry bags which hung in the engine room. The engine room was also used for wet clothes and towels.

Bryophytes hanging to dry in the engine room. **Photo by Barb Andreas**

Our cook, Chacón, was wonderful. Most days we had hearty stews with potatoes, carrots and huge chunks of meat. We often had cabbage slaw. The waters of the area are famous for "centolla," a southern king crab. Since it was out of season, our cook used frozen centolla to stuff avocados and tomatoes. One night, a fishing vessel tied up beside us. The crew traded medicine for a supply of a white fish, locally called congria.

Bill Buck looking for *Blindia* in a lake, in the Magellanic tundra. **Photo by Barb Andreas**

The archipelago is made up of dozens of islands that vary in size. Bill decided to concentrate on larger islands because there was a greater chance to find more

species. The islands along the Beagle Channel often had glaciers and forests dominated by tall trees of southern beech (*Nothofagus betuloides*, *N. antarctica*, and *N. pumilio*. Another common tree was *Drimys winteri*, which I remembered from Plant Anatomy class as an angiosperm with vesselless wood (the water conducting cells are tracheids). Liverwort and moss hummocks, up to a meter in thickness, covered the floor of these wetter forests. They also formed epiphytic "islands" in the large tree branches. The bryophyte-covered forest floor, with an abundance of shrubs, ferns, and small trees, made walking difficult.

As we headed south toward Cape Horn, the landscape changed from mountains and glaciers to tall hills and snow fields. The same species that were trees along the Beagle Channel became shrubs. As we went further south, these "trees" became shrubs that reached only a foot or so in height. Additional vascular plants in this shrub-dominated community included *Berberis ilicifolia*, *Chiliotrichum diffusum*, *Maytenus magellanica*, and *Ribes magellanicum*. There were large open areas of Magellanic tundra dominated by a member of the Juncaceae, *Marsippospermum grandiflorum*. Interspersed with this were cushion plants, similar to what one would find in the alpine zones of North American mountains. As we moved closer to Cape Horn, the Magellanic tundra was at sea level.

It is hard to imagine, but true, that these spine-laden shrubs in the coastal areas grew so tightly together that it was possible to walk on the tops of them – just imagine a field of tightly trimmed hedges and walking over it.

Magellanic tundra dominated by *Marsippospermum grandiflorum*. **Photo by Barb Andreas**

The skies were frequently overcast, and we had some form of precipitation every day. The wind was almost always blowing – with gusts on top of that. The captain said that we experienced winds as high as 75 mph. When we hit water that was not protected from the fierce waves of the Drake Passage, the seas were really rough. The crew gave us warning to use the head before the patches of rough water because the waves were such that we were not allowed on deck. The roughest water happened on our return to Punta Arenas in a region called Bahía Desolata, an area unprotected from the Antarctic. Some of the scientists reported levitating from their bunks. Items in the galley came off the wall and counters, and the propane tanks which had been securely fastened to the back of the bridge, were

torn loose. I slammed down on the frame of my bunk and injured a rib**.**

When rough waters were announced, some took medication for sea sickness. One of the scientists, in spite of medication, never adjusted to being in rough water. I have memories of him sitting, uncomplaining, with a bucket between his knees.

One of the highlights for both the scientists and the crew was a chance to visit Cape Horn on Isla Hornos. Located at 55°38'S, 67°16'W, it is the southernmost point of land before the continent of Antarctica. The landscape was treeless, but there was an abundance of bryophytes. Although the crew had gone by this point many times, this was their first opportunity to disembark. They visited the lighthouse, climbed among the rocks, and took photos of each other. We all had our photo taken in front of a sculpture made by José Balcells which features a silhouette of an albatross.

Upon returning to Punta Arenas, our field specimens were dried, boxed, and mailed to our respective research institutions. To date, about three-fourths of my collections are identified. Not being associated with a bryophyte herbarium that specializes in foreign material has made identifications harder.

Blindia is a genus that grows in wet habitats. Bill showed me how to look for *Blindia* in hillside seeps within the Magellanic tundra. That was the habitat for *B. robusta* and *B. serrata*. I found *Blindia magellanica* on wet rocks along streams. *Blindia inundata* grew attached to rocks, submerged in lakes within the Magellanic tundra**.** I was elated to find that the *Blindia* I collected from rocks in a fast-moving stream on Isla Grande de Tierra del Fuego turned out to be *B. torrentium*. Prior to the 2013 expedition when Bill collected it at a different locality on the same island, *B. torrentium* was known only from the Falkland Islands. We stopped at the type locality for *B. buckii*, where I was able to recollect it. I also found *B. buckii* in another stream elsewhere on Isla Wollaston.

Blindia buckii on rock. **Photo by Barb Andreas**

In all, we visited 12 islands. I collected about 25 specimens of *Blindia*, including several new localities for *B. buckii* and *B. serrata*. This gave me more confidence that the species occurred in places other than the type localities.

This was an expedition of a lifetime. I have been lucky to have traveled to many foreign countries. However, none had been a scientific expedition in search

of bryophytes. This expedition was not easy. Living space was crowded. We were frequently cold and wet. There was no time for drama – every day one had to be careful not to make a costly mistake that could impact the trip. However, I'd do it again in a heartbeat! **– Barbara K. Andreas**

It's not the years in your life that matter, it's the life in your years. Abraham Lincoln

2014 FALL FORAY, ADAMS AND PIKE COUNTIES

The 2014 Fall Foray was held on October 3-5. Although Adams has been extensively surveyed (Osterbrock & Snider 1985, Andreas, Showman & Zloba 2005, Andreas, Showman & Lindemer 2006) OMLA decided to return to the site of our first Foray in 2004 to celebrate our 10th anniversary. The Cincinnati Museum Center and the Edge of Appalachia preserve system graciously provided a base for the event at the Eulett Center and Rieveschl Chalet. The event was attended by 18 OMLA members. Barb Andreas, Bob Klips, Diane Lucas, Janet Traub, Jim Toppin, Ray Showman, and Mark Zloba were present at the 2004 foray. See the end of this issue for a group photo of the foray.

Our first collecting location, the General Electric Engine Testing Facility, was on October 3. This facility contains around 7,000 mainly undisturbed and unmanaged acres. Our guide was John Howard, who works for GE and is an outstanding naturalist. We visited two areas of fairly mature woodland with limestone and some sandstone at the surface.

October 4 was spent at two Edge of Appalachia preserves. Our guide for the day was Mark Zloba, OMLA member and Ecological Manager at EOA for the Cincinnati Museum Center. Mark is an exceptional field naturalist with knowledge of most of the area plants and animals. In the morning we visited The Wilderness, a wonderful forested area with a prairie glade. Steep slopes and a ridge top with dolomite outcrops provided many interesting habitat niches. This unusual combination of geology and topography supports many rare vascular plants.

In the afternoon we visited a recently acquired EOA property (Easter Run) featuring a dolomite gorge with a small stream at the bottom. After that we returned to our deluxe scope room at The Eulett Center. Dinner that evening was catered barbeque with all the "fixins," and a cake to celebrate the 10th anniversary of the OMLA.

Our final day, October 5, was spent at Strait Creek Prairie Bluff Preserve, a Nature Conservancy property in Pike County. Our guide was Dave Minney, former TNC Land Manager and one of Ohio's best field botanists. The area consisted of a creek valley covered with young forest, uplands with prairie glades and a very narrow ridge with dolomite cliffs on both sides. This ridge, called a "snake spine" by our guide, provided unusual habitat which hosted several rare vascular plants.

Macrolichens recorded during the Foray are listed in **Table 1** on following pages. A total of 59 species were found, a very good total for the time spent. The GE Facility yielded 38 species while the EOA properties totaled 43. None of

these was new for Adams county, but several species were new for the EOA collection and were added to the herbarium at the Eulett Center. Nothing extremely unusual or rare was found but the lichens were a good representation of southern Ohio's flora. This was a great opportunity for the several of our members learning lichens.

The Strait Creek Preserve yielded 30 species with 3 new for Pike County. Again, this was a nice sampling of lichens for this habitat, but nothing very rare was found.

Bryophytes are listed in **Table 2**. A total of 62 mosses, 9 liverworts, and one hornwort were collected during the 2014 fall foray. Of these, there were 3 moss county records for Adams County: *Brachythecium falcatum*, *Dicranum fuscescens*, and *Eucladium verticillatum*. The hornwort, *Anthoceros laevis*, was newly reported for the county, as was the liverwort *Leucolejeunea clypeata*. Eight moss records were new to Pike County. For bryophytes, Pike County has also been extensively collected. The Crum/Tuckerman workshop had visited the same locality in 2005, and the 2007 OMLA Fall Foray visited another locality in Pike County (Showman & Andreas 2007).

Literature Cited

Andreas, B.K., R.E. Showman, and J.C. Lendemer. 2007. The 2006 Combined Crum/Tuckerman Workshop in Ohio. Evansia 24(3): 55-71.

Andreas, B.K., R.E. Showman, and M.H. Zloba. 2005. Formation of the Ohio Moss and Lichen Association, and Report of the First Fall Foray to the Edge of Appalachia Preserve System, Adams Co., Ohio. Evansia 22 (3): 92-100.

Osterbrock, A.J. and J.A. Snider. 1985. A checklist of the bryophytes of the Edge of Appalachia preserve system, Adams County, Ohio. Ohio J. Sci. 85(3): 138-143.

Showman, R.E. , and B.K. Andreas. 2007. The 2007 Fall Foray. OBELISK 4: 2-4.

- Ray Showman and Barb Andreas

THANK YOU BARB!

Our founder had an idea,
about ten years ago,
to start an organization,
of people who want to know,

about bryophytes and lichens,
those understudied plants,
and travel over Ohio,
adding to distribution maps.

We're now an association,
of fifty members strong,
we've been to many counties,
and our records list is long;

so we heartily thank you Barb,
for your vision years ago,
your work and perseverance,
have helped us all to grow.

- Ray Showman

NEWS AND NOTES

Dates to Remember:
January 10, 2015. OMLA Annual Business Meeting
The 2015 OMLA annual business meeting and workshop will be held on Saturday, January 10, 2015. It will take place at the Museum of Biological Diversity, the Ohio State University, Columbus, OH. Details will follow as an e-mail to the membership. Information can also be obtained from Cynthia Dassler, dassler.1@osu.edu. Bob Klips has volunteered to teach a session on beginning moss identification. It is an excellent time to learn new skills, or refresh old ones.

March 11, 2015. The Ohio Biodiversity Conference. Check the Division of Wildlife website for details. This will be the debut of the Division of Wildlife field guide series **Common Lichens of Ohio**, by Ray Showman and Bob Klips. This is a free publication and will be available here or at the Botanical Symposium (below).

March 27, 2015 The Ohio Botanical Symposium. Watch for announcements.

Please take 15 min to complete this short online survey. The survey is part of a research project on public contributions to science that is being conducted by OMLA member Linda Fuselier (University of Louisville). Thank you for your participation!
https://qmsweb.louisville.edu/blue/a.aspx?l=2567_1_AAAAAAAAUG8

I have a few copies of Don Flenniken's book: **The Macrolichens in West Virginia**. Please contact me if you are interested in obtaining a copy.

WHERE TO NEXT?

During the last 10 years, OMLA Forays have visited 22 counties, or 23 (Scioto) if you include the Crum-Tuckerman Workshop. This effort has amassed hundreds of new county records for mosses, liverworts and lichens. The map below shows the counties visited in orange. The counties highlighted in yellow are counties which we believe are still under-collected.

Where do we go next? Barb and I will plan the 2015 Fall Foray in Brown county but we need someone to plan the Summer Foray. After this, Barb and I will have planned 3 out of the last 4 forays. I think for 2016 we will depend on other OMLA members to step up and plan both forays.

Think about where you might plan the one day Summer Foray in 2015 and also

about where you might volunteer to organize forays in 2016. The map is a suggestion only. If you know an area in another county that would be a good foray location please proceed with it. Don't be afraid to think outside the box. We had one foray in conjunction with another group's outing; this might be fun again. Maybe a foray during an organized bioblitz (as Bob suggested for this year) would work. Maybe, depending on the location, we could do a two-day Summer Foray. Think about it. We will set the schedule for 2015 at the Winter Meeting. **– Ray Showman**

A SPECIAL BREED
Lichens are a special breed,
a marvel of evolution;
whenever there is a niche to fill,
nature provides a solution.

A fungus and an alga,
unlikely partners two;
but together they combine to make
an organism new.

Blazing hot or freezing cold,
they can live where no others grow;
in polar regions of the world,
they dominate the show.

If you want to study something unique,
lichens are the group for you;
there's still a lot of work undone,
so see what you can do!
- Ray Showman

Cynthia Dassler has created a YouTube on her method of creating thin sections for her classes. If you are interested, here is the link: http://youtu.be/rL2rlnDW0Jw

---

I have prepared "Guidelines for contributors to OBELISK" and this will be posted on the OMLA website in the Newsletter section. Please look at these before the next OBELISK. It is a lot easier to set things up at the start rather than change things at the end. Thank you for your attention to this!
- Ray Showman

Table 1. Lichens recorded on the 2014 Fall Foray. X=present, N=new county record.

Lichen Name	GE Test	Wilderness	Strait Ck.
Anaptychia palmulata	X	X	
Candelaria concolor	X		X
Canoparmelia crozalsiana	X		X
Cladonia apodocarpa	X		
Cladonia caroliniana	X		
Cladonia coniocraea	X	X	X
Cladonia cristatella	X	X	
Cladonia furcata	X	X	X
Cladonia macilenta	X	X	X
Cladonia peziziformis	X	X	
Cladonia piedmontensis	X		
Cladonia subtenuis	X	X	X
Cladonia uncialis	X		
Collema conglomeratum		X	
Collema subflaccidum		X	
Dermatocarpon luridum		X	
Dermatocarpon muhlenbergii		X	X
Evernia mesomorpha		X	
Flavoparmelia baltimorensis	X		
Flavoparmelia caperata	X	X	X
Flavopunctelia soredica	X		
Heterodermia granulifera			**N**
Heterodermia obscurata	X	X	X
Heterodermia speciosa	X	X	
Hypotrachyna livida	X	X	
Hypotrachyna showmanii	X		
Imshaugia aleurites		X	
Leptogium cyanescens	X	X	
Melanelixia subaurifera			X
Myelochroa aurulenta	X	X	X
Myelochroa galbina	X	X	X
Parmelia squarrosa		X	
Parmelia sulcata	X	X	X
Parmelinopsis minarum	X		
Parmotrema chinense		X	
Parmotrema crinitum		X	**N**
Parmotrema hypotropum	X	X	X
Parmotrema reticulatum	X	X	
Parmotrema stuppeum	X	X	
Peltigera canina	X		**N**
Peltigera elisabethae		X	
Phaeophyscia adiastola	X	X	X
Phaeophyscia hirsuta		X	
Phaeophyscia pusilloides		X	
Phaeophyscia rubropulchra	X	X	X
Phaeophyscia squarrosa		X	X
Physcia americana	X	X	X

Lichen Name	GE Test	Wilderness	Strait Ck.
Physcia millegrana	X	X	X
Physcia pumilior		X	
Physcia stellaris		X	X
Physconia detersa			X
Punctelia caseana	X	X	X
Punctelia missouriensis	X	X	X
Punctelia rudecta	X	X	X
Pyxine sorediata	X	X	X
Pyxine subcinerea	X	X	X
Ramalina americana		X	
Usnea strigosa		X	X
Xanthoparmelia plittii	X		
Total species (59)	**39**	**44**	**30**

Table 2. Bryophytes recorded on the 2014 Fall Foray. X=present, N=new county record.

Moss Name	GE Test	Wilderness	Easter Run	Strait Ck.
Anomodon attenuatus	X			X
Anomodon minor	X			
Anomodon rostratus				X
Anomodon viticulosus			X	
Atrichum altecristatum				**N**
Atrichum angustatum	X			
Aulacomnium heterostichum				X
Barbula unguiculata	X			**N**
Brachythecium laetum				X
Brachythecium falcatum	**N**	**N**		**N**
Brachythecium plumosum	X			**N**
Bryoandersonia illecebra	X			X
Callicladium haldanianum		X		
Calliergonella lindbergii				X
Campylium chrysophyllum		X	X	X
Campylium stellatum				**N**
Clasmatodon parvulus	X			
Ctenidium malacodes				X
Cyrto-hypnum minutulum			X	
Dicranum fuscescens	**N**			
Dicranum montanum	X	X		X
Dicranum scoparium	X			
Dicranum viride				X
Didymodon tophaceus			X	
Diphyscium foliosum	X			
Encalypta procera				X
Entodon seductrix	X	X		
Eucladium verticillatum			**N**	
Fissidens dubius		X		X
Fissidens subbasilaris	X			X
Fissidens taxifolius				**N**

Moss Name	**GE Test**	**Wilderness**	**Easter Run**	**Strait Ck.**
Forrstroemia trichomitria	X			
Gymnostomum aeruginosum			X	X
Haplohymenium triste	X	X		X
Hedwigia ciliata	X			
Hyophila involuta			X	
Hypnum curvifolium				X
Hypnum imponens	X			
Leskea gracilescens	X			
Leucobryum albidum	X			
Leucodon julaceus	X	X		X
Mnium marginatum				X
Myurella sibirica				X
Orthotrichum ohioense	X			
Plagiomnium ciliare	X			X
Plagiomnium cuspidatum				X
Platygyrium repens	X		X	X
Pleurozium schreberi	X			
Pogonatum pensilvanicum	X			
Pohlia wahlenbergii				**N**
Polytrichastrum ohioense	X			X
Pylaisiadelpha tenuirostris	X			
Rhynchostegium serrulatum	X			
Schistidium apocarpum		X		X
Schwetschkeopsis fabronia			X	
Sematophyllum demissum	X			
Taxiphyllum deplanatum			X	
Taxiphyllum taxirameum				**N**
Thelia asprella	X			
Thelia hirtella	X			
Tortella humilis		X		X
Thuidium delicatulum	X			
Total Mosses (62)	**33**	**10**	**10**	**33**
Hornwort Name				
Anthoceros laevis	X			X
Liverwort Name				
Cololejeunea biddlecomiae			X	
Conocephalum salebrosum	X			
Fossombronia foveolata	X			
Frullania eboracensis	X	X		X
Frullania inflata		X		
Leucolejeunea clypeata	**N**			

2014 Summer Foray Left to right: Bob Klips, Diane Lucas, Linda Fuselier, Jim Toppin, Janet Traub, Ray Showman, Carole Schumacher, Jeff Rose, Bill Schumacher, Suzanne Nelson, Chad Nelson. **Photo by Bob Klips**

2014 Fall Foray Left to right: Bob Klips, Cynthia Dassler, Angie Cole, Steven Nagel, Bill Schumacher, Jim Toppin, Bonney Harnish, Mark Zloba, Barb Andreas, Ray Showman, Maggie Gray, Dan Stevenson, Carole Schumacher, Suzanne Nelson, Janet Traub. Not pictured but present at least one of the Fall Foray sites: Linda Fuselier, John Howard, Sara Klips, Diane Lucas, Dave Minney and Jamie Stefanski. **Photo by Bob Klips**