

A Note from the President

It is encouraging to see the Great Lakes Chapter evolve into a productive organization. We have representation on the MBC State Board, a GLC Treasury, a webpage on the internet, a newsletter, field trips, and student foray sponsorships. Much of these accomplishments are due to the diligence of our four board members, Leslie Kuhn, Jim Hewitt, Phyllis Higman and Derek Shiels. Thank you for your enthusiasm, ideas, and commitment.

This year we introduced our first ever, walk-in-the-woods field trips. Jim Hewitt and Derek Shiels coordinated a May hike to Palmer's Wood in Leelenau County, MI that was followed by a trek to Pete's Woods in Benzie County. Later in August we visited Whitehouse Nature Center on the Albion College campus. Each of these field trips offered a unique look into a variety of plants in different communities. A report on the highlights is included in this newsletter.

For those of you who missed the MBC September Foray, it was a great event. GLC was pleased to sponsor two students from Michigan State University. Each student wrote a short commentary on their experiences; their enclosed insights are encouraging.

Not only are we interested in attracting new members to the club; we also want to connect with our current members. A short online survey was emailed to you earlier this month. It will provide valuable feedback to guide GLC in a direction that serves the short and long-term goals of our chapter. Please take a few minutes to respond to a few brief questions and share your opinion with us at:

<https://www.surveymonkey.com/r/T6PB68M>

or by mailing in the survey on pages 9-10.

With best wishes for a Happy Holiday Season,
Irene Eiseman

Field Trips in 2016

The Chapter held two field trips, the first in the northwest Lower Peninsula and the second in the south-central L. P. On the afternoon of May 21st we visited Palmer Woods, a newly-acquired property of the Leelanau Conservancy. Located east of Glen Lake it consists of 700 mostly wooded acres of mixed hardwood forest. We were met and greeted by Derek Shiels, Chapter vice president who helped organize the outing, and by Dan Palmer who protected this land and made it available to the Conservancy. Emily Douglas, the Conservancy Land Steward, led the group on a pleasant walk through part of the woods where we saw a variety of ferns, sedges, and some still-blooming spring ephemerals.

We then drove south into Benzie County and met Angie Lucas at the trailhead for Pete's Woods, a part of the C. S. Mott Nature Preserve that is owned and managed by the Grand Traverse Regional Land Conservancy. Angie Lucas works



Palmer Woods (photo by Tim Eiseman)



Palmer Woods (photo by Jim Hewitt)

there as Senior Land Steward and she led us along the trail through a rich woods filled with fine displays of wildflowers including foamflower (*Tiarella cordifolia*) and wood poppy (*Stylophorum diphyllum*). After the long afternoon we adjourned to Benzonia for dinner at The Roadhouse Mexican Bar and Grill.



Pete's Woods, photo (by Jim Hewitt)

The site of the second botanical excursion was the Whitehouse Nature Center on the campus of Albion College. Arriving on the morning of August 27 we met our hosts, Chapter members Dan Skean, Professor of Biology at the College, and Barbara Rafail, a graduate of Albion and semi-retired botanist. After a tour of the Nature Center building and learning about their programs, we walked, under threatening skies, on trails through the property which included some interesting plants on a prairie restoration such as wild quinine (*Parthenium integrifolium*) and downy sunflower (*Helianthus mollis*), a state

threatened plant. We also saw American chestnut (*Castanea dentata*) and, along the Kalamazoo River, wild- rice, (*Zizania palustris*).

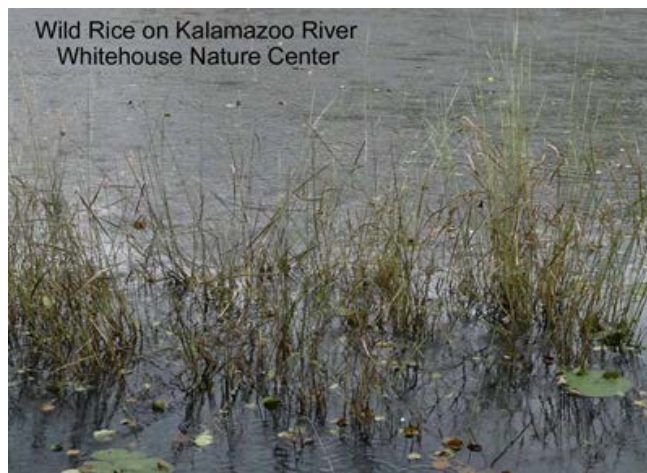
As rain began to fall at the end of our walk we postponed a trip to a second site, Ott Preserve, until another time. *Jim Hewitt, Secretary*



Whitehouse Nature Center (photo by Jim Hewitt)



American chestnut (photo by Jim Hewitt)



Wild Rice on Kalamazoo River
Whitehouse Nature Center

Wild Rice (photo by Jim Hewitt)

2016 Spring Foray

This year's Foray in Kalamazoo was one of the best organized events of record. Kudos to the planning team from the Southwestern Chapter.

Eight members from GLC were in attendance including one member from Illinois and one from Indiana.

2016 Student Foray Awards

Congratulations to Meg Kargul (left) and Tecoria Strothers (right), 2016 recipients of the MBC Student Foray Awards. Both students attended the Fall Foray in Kalamazoo, MI as sponsored students from the Great Lakes Chapter. Tecoria and Meg are Seniors at Michigan State University studying Plant and Environmental Biology. A summary of their experiences at the foray is captured below. We thank the Michigan Botanical Foundation for financial assistance in sponsoring these awards.



M.K. - As a recipient of the MBC Foray Student Award, I was given the opportunity to delve deeper into unique ecosystems and learn from a knowledgeable group of botanists. The most memorable field trip for me was the mushroom walk at the Kellogg Forest - as it was my first exposure to mycology. I was fascinated by the diversity of mushrooms we found, and this field

trip gave me the excitement and information to go on mushroom walks of my own. Throughout the foray, I talked to many professional and amateur botanists - learning an abundant amount of plant identification as well as insight into their career paths. One of the most important pieces of information I learned by talking to the members of the MBC was to pursue a career I am passionate about - meaning ecological plant biology research in my case. I am extremely grateful to have had the opportunity and experience of attending this past foray to learn the native plants in Kalamazoo, make connections with knowledgeable botanists, and solidifying my desire to study plants.

T.S. - I enjoyed my time at the MBC Fall Foray this year. Every component of the trip was intriguing. I enjoyed meeting new people and visiting some of the wonderful landscapes in Michigan. My favorite places were the bog at the Allegan State Game Area, and the lake that was centered in the middle of the Portman Preserve. I enjoyed Todd Barkman's passion and enthusiasm for his career, and his work with orchids was very cool to see. Throughout the conference, I was able to meet people from various career paths and hear their stories of how they got captivated by nature. I was also able to meet other students who have a growing desire to work with nature, and I'm sure the other students are just as grateful to have attended their first foray with the MBC like I am.

Great Lakes Chapter Membership

As a side note, our total 2015 GLC membership is holding steady at 68 members. We welcome seven new members; William Taylor (WI), Paul Marcum (IL), Patrick Deacon (Ontario), Joseph Johnson (Nova Scotia) and Catherine Garnham, Anita Scussel, and Robert Weisbrodt (MI).

Utricularia, Urticaria, and Other Hairy Matters...

Leslie Kuhn, Professor of Biochemistry & Molecular Biology, Michigan State University
Treasurer and Director-at-Large, Great Lakes Chapter, Michigan Botanical Club

Much of the interesting texture of plants comes from the consistency and density of their epidermal hairs. The different types and growth patterns of these hairs¹ are also very useful for identifying plants:

Arachnoid: Cobwebby - soft, entangled hairs.

Barbellate: Hairs with barbs down the sides.

Bearded: Long, stiff hairs.

Bristly: Stiff hairs.

Canescent: Dense grayish-white hairs.

Ciliate: Hairs along leaf margin forming a fringe.

Floccose: Tufts of soft, woolly hairs.

Glandular: Hairs with enlarged gland at tip.

Hirsute: Stiff hairs, rough to the touch.

Hispid: Stiff (rigid), bristly hairs - may penetrate skin.

Hoary: Covered with short fine hairs (white down).

Lanate: Woolly or cottony hairs.

Pilose: Sparse, soft and straight hairs.

Puberulent: Minutely pubescent (diminutive of pubescent).

Scabrous: Rough to the touch due to short, stiff hairs.

Sericeous: Appressed, fine and straight hairs (silky).

Stellate: Star-shaped hairs (common in Malvaceae).

Strigose: Sharp, straight, appressed hairs.

Tomentose: Densely matted, soft white wool (tomentum).

Villous: Long and soft hairs (shaggy) - not matted.

Woolly: Long, soft entangled hairs (similar to tomentose).

Plant biologists use the term trichomes for these epidermal hairs (pronounced like, “try combing your hair”). It turns out that trichomes have a remarkable variety of functions, depending on their architecture:

- shedding excess water
- cooling the plant by increasing the surface area and exchanging heat with surrounding air
- protecting plants from freezing by trapping warm air in a dense layer of down
- deterring predation by making plants hard to chew or swallow, or preventing insects from moving along the surface
- synthesizing and secreting digestive enzymes (in carnivorous plants) or creating sticky substances that attract or trap insects²; the structure of one of these secretory trichomes is shown in Figure 1
- providing a sense of touch, as in mimosa leaves, which curl up when touched⁴, and bladderworts (*Utricularia*), with trichomes that form an incredibly fast trap mechanism

The traps in some bladderworts are lined with a network of four-armed glandular trichomes or “quadrid hairs” (Figure 2), and another special set of hairs called tentacles act as tripwires to close the trap door. Yet other trichomes in the bladderwort seal the trap shut, purge water from the interior, and secrete juices to digest the prey⁷. As described by Janet Braam, “The *Utricularia* trap, attached via a stalk to the rootless plant body, is a thin-walled hollow sac with a watertight trapdoor. When the trap is set, the outer walls are concave and the chamber is under negative hydrostatic pressure. Various appendages [trichomes], some with mucilage-secreting glands, have roles in luring prey to the trap door entrance and others near the bottom of the door are the touch-sensitive triggers... Small creatures, such as water fleas, ... fall prey to *Utricularia* traps. Within 30 milliseconds of tactile detection, the trap door bursts open, the sac walls move outward to take on a slightly convex shape and, as a result, there is a tremendous suction of water into the bladder. All accompanying creatures are swept in with the current. The trapdoor closes and the meal takes place”⁴. So, together these trichomes create a remarkable machine, far more sensitive and adaptive than our mousetraps!

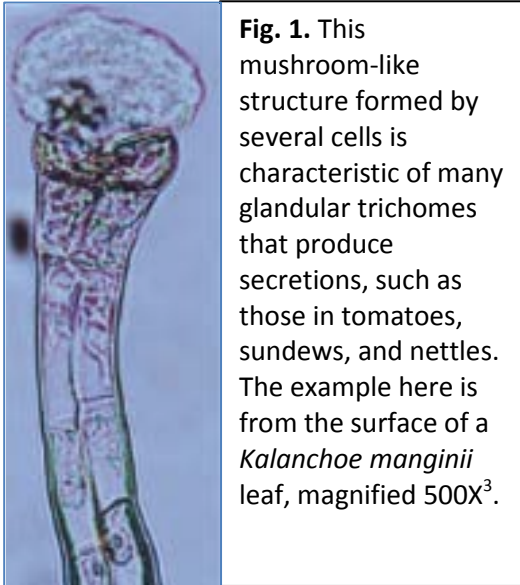


Fig. 1. This mushroom-like structure formed by several cells is characteristic of many glandular trichomes that produce secretions, such as those in tomatoes, sundews, and nettles. The example here is from the surface of a *Kalanchoe manginii* leaf, magnified 500X³.

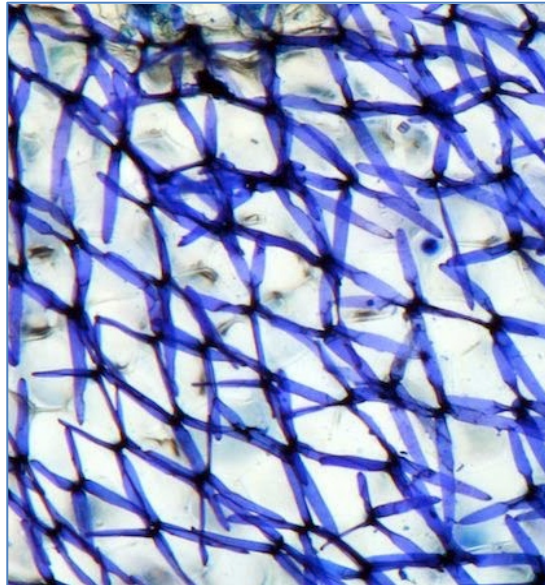


Fig. 2. The insect trapping sac in some bladderworts is formed by a mesh-like scaffold of quadrifid hairs (dye blue), a type of trichome that interlocks and allows the trap to flex open and then close⁵. Microscope image by Sally Peacock, Botanical Society of Britain & Ireland⁶.

We are the prey for another type of trichome. Stinging nettles (*Urtica dioica*; Figure 3) have hollow, hypodermic needle-like trichomes in their stems and leaves to defend against predators/herbivores. When we brush against them, they inject a mixture of formic acid (also found in bee venom), acetylcholine (a neurotransmitter), and histamine (causing a local immune reaction)⁸. Two remedies for stinging nettle rash (urticaria) are to apply crushed jewelweed (*Impatiens capensis*) leaves, which often grow near nettles, or a paste made from baking soda and water, which neutralizes the acid. Another way to get back at this common wetland-edge plant is to harvest it (wearing rubber gloves) and make pesto! I had an excellent pasta with nettles dish in Sicily, and here's a recipe from New Mexico⁹:

Ortequilla (Stinging Nettle) and Cilantro Pesto

To handle it, you must wear gloves. Wash the plant in water with 1 Tbsp of bleach, hydrogen peroxide, or vegetable disinfectant and rinse thoroughly. Blanch orteguilla in boiling water and drain. I pick as many plants as I can, blanching and freezing them in ziplock bags, about 1 cup per bag. This recipe is really good and better chilled overnight. Makes about ¾ cup.

- ½ cup olive oil
- ¼ cup rice vinegar
- 4 cloves garlic, peeled
- 1 heaping Tbsp of peanut butter
- ¼ tsp cayenne pepper
- ¼ tsp salt
- ¼ tsp pepper
- 1 bunch washed fresh cilantro
- 1 cup washed and cooked orteguilla



Fig. 3. Stinging nettle (Photo by B.S. Walters, from <http://michiganflora.net>)

Put olive oil, vinegar, garlic, peanut butter, and seasonings in a blender first, blend a little, and then add the cilantro and orteguilla gradually while pulsing, until you have a thick paste. Serve as a sauce on pasta, potatoes, etc.

So, the next time you see a hairy plant, like those in Figure 4, consider how those beautiful hairs are functioning, based on where the plant lives and the particular challenges it faces!



Fig. 4. Sensitive fern (*Onoclea sensibilis*; photo L. Kuhn), hairy hawkweed (*Hieracium longipilum*; photo B.S. Walters, <http://michiganflora.net>), and wild rose after first hard frost (photo L. Kuhn).

References

1. <http://waynesword.palomar.edu/termlf2.htm>
2. J. Fürstenberg-Hägg, M. Zagrobelny, and Søren Bak (2013) “Plant Defense Against Insect Herbivores”, *Int. J. Mol. Sci.* 14(5): 10242–10297.
3. E. Weryszko-Chmielewska and M. Chernetskyy (2005) “Structure of Trichomes from the Surface of Leaves of Some Species of *Kalanchoë*”, *Acta Biologica Cracoviensia Series Botanica* 47(2): 15–22.
4. J. Braam (2005) “In touch: plant responses to mechanical stimuli”, *New Phytologist* 165: 373–389.
5. A. M. Doyle and J. Parnell (2003) “Geometry and Bladderworts: Quadrifids of Irish *Utricularia* Species”, *The Irish Naturalists' Journal* 27(6), 213-222.
6. http://bsbipublicity.blogspot.com/2014_08_01_archive.html
7. B. A. Fineran (1985) “Glandular Trichomes in *Utricularia*: A Review of their Structure And Function”, *Israel Journal of Botany* 34(2-4), 295-330.
8. <http://www.botanic.cam.ac.uk/Botanic/TrailPlace.aspx?p=27&ix=261&pid=0&prcid=0&ppid=0>
9. A. Rodriguez (2016) *Coyota in the Kitchen: A Memoir of New and Old Mexico*, University of New Mexico Press, Albuquerque, NM, pp. 55-56.

Spring Foray 2017

Mark your calendars! The 2017 foray will be held in the Straights area over the Memorial day weekend, May 26-29. The Huron Valley Chapter is hosting the Foray that will be based in St. Ignace, Michigan. Details and registration materials will be printed in the spring *Arisaema* newsletter.

**Great Lakes Chapter, Michigan Botanical Club Board Meeting Minutes
September 4, 2016**

Call to Order: The meeting was called to order by Irene Eiseman at 4:39 pm in the Boardroom of Holiday Inn Kalamazoo-W. Irene was joined by board members Jim Hewitt, Leslie Kuhn, and Phyllis Higman and Foray participant Glenn VandeWater.

Review of Agenda: Leslie asked that “Survey of members” be added to the agenda.

Treasurer’s Report: Leslie distributed a report showing a current account balance of \$1,504.39 which is higher by \$545 than the January 1, 2016 beginning balance. Yet to be disbursed this year are the hotel bill for two sponsored students at the Foray (\$370) and the cost of Volume 55 of The Michigan Botanist (now known as The Great Lakes Botanist). If all four issues are published this would amount to about \$840.

Dues Rate 2017: The initial dues structure, established by the Board for 2016, is: Individual - \$25; Family - \$35; Student - \$15; Benefactor/Sustaining member - \$40+. Leslie felt that based on current income and expenses the Chapter would be leading a hand-to-mouth existence with this dues rate and that it would be good to have more money to support various projects. She moved to raise the individual dues to \$30, the family dues to \$40, the benefactor/sustaining level to \$50, and leave student unchanged at \$15. Phyllis and Irene generally felt that a \$5 increase would not be inappropriate. Jim was not in favor of a dues increase. Phyllis seconded the motion and it passed with a 2/3 majority.

Terms of Office: In May, 2015 the Great Lakes Chapter (then known as Special Members

Chapter) came into existence. Since the Chapter’s fiscal year is the calendar year (Jan. - Dec.) Irene wanted to clarify in which year the terms of the officers began. It was agreed that the beginning of the term for all the officers would be January 1, 2016.

2017 Field Trips, Activities, Events: Among the ideas mentioned for next year: a post- Spring Foray walk on the way home downstate; a trip to the Fennville area in June to look for orchids; events to target and engage college students, like in Lansing, using a local expert on relevant topics; engaging like-minded groups such as Wild Ones to boost attendance at events; using the mini-foray concept to re-visit a foray site at a different time of year; something in the UP for members there. Jim said we did target member concentrations in the Northwest LP and the South-Central LP for our two field trips this year but attendance was light.

End-of-Year Newsletter: Leslie suggested two topics: plant communication and plant “trichomes”. She will work on an article for the latter.

Member Survey: Two methods were mentioned: an attachment to the dues form and the online service, Survey Monkey. Board members would think of questions to ask.

Next Meeting: Not scheduled at this time.

Adjournment: The meeting was adjourned at 5:46 PM

Submitted by Jim Hewitt, GLC board secretary, September 9, 2016; revised 9/10/16.

MBC – Great Lakes Chapter Board Members

President:	Irene Eiseman	eisemani@gmail.com
Vice President:	Derek Shiels	d.r.shiels@gmail.com
Secretary:	Jim Hewitt	Tz4ggm@aol.com
Treasurer, Director-at-Large:	Leslie Kuhn	KuhnL@msu.edu
Director-at-Large, Newsletter Editor:	Phyllis Higman	higmanp@michigan.gov

Highlights of the MBC - GLC Treasury January – November 2016

Income:

We started the year with \$959.

Memberships: \$1935. in dues were received this year, with 18 at the family or sustaining levels (>\$25). One member has since transferred to another chapter (-\$25). Net membership dues: \$1910.

Expenses:

Supply costs and bank fees: \$94.45 in postage, labels, check stamp, and foreign check conversion fees

The Michigan Botanist (TMB) volumes 54 (1-2) and (3-4): \$840.

Volume 55(1-2) for 68 members: \$408. Total to TMB: \$1248.

Michigan Botanical Club main organization membership fees for 68 members at \$7 each: \$469

Foray scholarships provided to two students: \$381.67 hotel and gas + \$240 meals & registration = \$621.67 total, less \$296.84 reimbursement from MBF Joan Robb Scholarship Fund = \$324.83 from our chapter

Account balance as of November 20, 2016: \$732.72

(By 12/31, possibly less \$408 for The Michigan Botanist issues 55(3-4))



Stiff goldenrod (*Solidago rigida*) (photo by Jim Hewitt)

*****2017 MBC – Great Lakes Chapter Dues*****

A New Year has arrived and it is time to pay your Chapter dues. Please see the instructions on the membership form (last page) and join us for another memorable year!

MBC – Great Lakes Chapter Member Survey

If you have not already responded to our member survey on-line, please share your thoughts by completing this paper survey and mailing it to: Derek Shiels , 1331 Atkins Rd. Petoskey, MI 49770.

1. Why did you join the Michigan Botanical Club? Rank these reasons by circling your ranking (You can circle a ranking more than once, i.e. you can have two "Important" rankings):

To receive the <i>Great Lakes Botanist</i> (formerly the <i>Michigan Botanist</i>).	Most important	Important	Less important	Not important
To be informed about and participate in botanical walks and forays.	Most important	Important	Less important	Not important
To learn more about plant taxonomy or other botany-related topics.	Most important	Important	Less important	Not important
To make connections, meet other botanical enthusiasts, and/or socialize at events.	Most important	Important	Less important	Not important

2. How would you rate your interest in the Great Lakes Chapter offering botanical walks (circle one)?

Not an interest
of mine
1

2

Maybe if it
is close!
3

4

I will be there
wherever it is!
5

Comments? (Please specify): _____

3. How far are you willing to travel to a chapter-sponsored botanical walk? Pick a distance between 30 and 500 miles _____

4. Do you have an area of expertise or interest related to botany that you would like to share with the GLC in some fashion? Select any that apply.

Write an article for the newsletter

Present a talk

Lead or coordinate a field trip

Host a social gathering

Not at this time

Other (please describe): _____

5. How would you rate your interest in the Great Lakes Botanist (formerly the Michigan Botanist)?

Low —————> High
1 2 3 4 5

MBC – Great Lakes Chapter Member Survey – Page 2

6. What kinds of articles would interest you?

a. In the Great Lakes Botanist? _____

b. In the Great Lakes Chapter Newsletter? _____

7. Do you want email announcements of other botanical events occurring throughout the Great Lakes area? Circle one: Yes No

8. How often do you use or visit the following? (Circle one answer for each line item.)

The Michigan Flora online website	Never or not familiar	Occasionally	Regularly (once a month or more)	Often (weekly or more)	Let's just say I'm very familiar
The MBC Facebook page	Never or not familiar	Occasionally	Regularly (once a month or more)	Often (weekly or more)	Let's just say I'm very familiar
Smart phone nature apps (iNaturalist, field guides*, etc.*)	Never or not familiar	Occasionally	Regularly (once a month or more)	Often (weekly or more)	Let's just say I'm very familiar

9. What has been your favorite thing about the MBC-GLC or what would you like to see added or changed to the club or chapter? (Feel free to use another sheet!)

THANK YOU!

Please mail your complete form to:

Derek Shiels
 1331 Atkins Rd.
 Petoskey, MI 49770

**Michigan Botanical Club – Great Lakes Chapter
2017 Membership Dues**

Name: _____

Address: _____

City _____ State/Province _____

Zip code + 4 digit code _____ + _____

Telephone: _____ Email: _____

Do you prefer to receive the *Arisaema* newsletter in paper format? _____

Sustaining membership _____ \$50.00 (or more)

Individual membership _____ \$30.00

Family membership _____ \$40.00

Student membership _____ \$15.00 University _____

US members, make checks payable to: **Michigan Botanical Club - Great Lakes Chapter**
Canadian members, please send a money order in US funds.

Mail to:

Irene Eiseman
MBC-Great Lakes Chapter
1873 Pierce Road
Chelsea, MI 48118

Thank you for your continued support!