



Minnesota Plant Press

The Minnesota Native Plant Society Newsletter

www.mnnps.org

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Fall 2012

Monthly meetings

Thompson Park Center/Dakota

Lodge

Thompson County Park

1200 Stassen Lane

West St. Paul, MN 55118

Programs

The Minnesota Native Plant Society meets the first Thursday in October, November, December, February, March, April, May, and June. Check at www.mnnps.org for more program information.

6 p.m. — Social period

7 – 9 p.m. — Program, Society business.

Nov. 1: Climate Change and the Temperate-Boreal Forest Ecotone, by Dr. Lee Frelich, professor, Department of Forest Resources, University of Minnesota. **Plant-of-the-Month:** Pennsylvania sedge (*Carex pensylvanica*), also by Dr. Frelich. **Seed exchange.** (See article on page 2.)

Dec. 6: “The eastern larch beetle: Historical perspectives and current significance to forest health in Minnesota,” by Fraser McKee, Ph.D. student, Department of Entomology, University of Minnesota. **POM:** Tamarack (*Larix laricina*), also by Mr. McKee.

Feb. 7: Program to be announced. Check the website (www.mnnps.org) for details.

MNNPS questions?

Go to www.mnnps.org to see the Society blog, news about field trips, meetings, and committees, and all issues of this newsletter since 1982.

Leaders give continuity to Native Plant Society

by Scott Milburn, president

Continuity has been critical to maintaining our Society as our organization moves into our fourth decade. We held officer elections at our Sept. 9 board meeting and re-elected all four officers from the last term.

I would like to point out that this will be Ron and Cathy Hubers' eighth year as treasurer, Shirley Mah Kooyman's seventh year as vice president, my seventh year as president, and Andrés Morantes' fourth year as secretary. Other positions within the organization have been held for multiple years, and in my view, that's a great thing.

New editor is needed

As I learn more about other non-profit organizations, I am extremely impressed by the workhorses in our group, from Ken Arndt and field trips, to Elizabeth Heck and the website.

Someone who really deserves appreciation is Gerry Drewry for her contribution as editor of the Plant Press. Did anyone realize that she has been in her current role since 1999?

Gerry has already been recognized by the Society with a lifetime honorary membership, but she deserves much more. Putting together a newsletter is not a

simplicistic task, especially when the editor is constantly dealing with a president's late column.

In the near future, we will need someone to step forward to take over as editor of the Plant Press. This will entail overseeing the content and format of the newsletter. It would be preferable for someone to initially work with Gerry in order to provide that needed continuity. I encourage those that are interested to contact both Gerry and me.

Issues facing Society

In looking forward to this next year and beyond, it is important to keep evaluating our trajectory. We will be discussing this more at future board meetings, but I invite the membership to speak up. In my last column, I mentioned the topics of School Trust Lands and cattle grazing on intact prairie. We need to continue exploring these issues and

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Seed exchange will be Nov. 1

Members are encouraged to collect seeds from Minnesota native plants that are growing on their own property and bring the seeds to the tables just inside the lodge before the Nov. 1 meeting.

Seeds must be packaged in envelopes or small containers and labeled with the plant's name, scientific name (if known), habitat type, location of source, and name of donor. No bulk seeds will be accepted.

Ken Arndt is in charge of the exchange. He needs volunteers to receive the seeds, help arrange them, answer questions, and take down the tables.

MNNPS welcomes new members

The Society gives a warm welcome to two new members who joined during the third quarter of 2012. Listed alphabetically, they are: Kaija Hermetag, Minneapolis; Matthew Jahnke, Duluth; Emily Peters, Minneapolis.

Treasurers' report for third quarter of year

Treasurers Ron and Cathy Huber report that income for the first nine months of the year totaled \$14,018 and expenses totaled \$12,420. This was a net gain of \$1,598.

Assets include \$17,819 in the checking account, \$8,990 in certificates of deposit, and \$55 cash, for a total of \$26,864.

Expenses included seven-months' rent, \$2,078, for Dakota Lodge. Communication printing costs, including the newsletter, membership directory, meeting postcards, and new member packets totaled \$785. Postage was \$375. Total communication costs were \$1,191.

The Hubers anticipate fourth-quarter expenses of \$2,218. These include \$1,000 for the Bud Markhardt memorial, \$505 for insurance, \$344 for communications, and \$265 for the website.

MNNPS Board of Directors

President: Scott Milburn, board member, scott.milburn@mnnps.org

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Minnesota Native Plant Society's purpose

(Abbreviated from the bylaws)

This organization is exclusively organized and operated for educational and scientific purposes, including the following.

1. Conservation of all native plants.
2. Continuing education of all members in the plant sciences.
3. Education of the public regarding environmental protection of plant life.
4. Encouragement of research and publications on plants native to Minnesota.
5. Study of legislation on Minnesota flora, vegetation, ecosystems.
6. Preservation of native plants, plant communities, and scientific and natural areas.
7. Cooperation in programs concerned with the ecology of natural resources and scenic features.
8. Fellowship with all persons interested in native plants through meetings, lectures, workshops, and field trips.

Pollination Biology of *Aplectrum hyemale* (Putty-root or Adam and Eve orchid)

by Charles L. Argue, Ph.D., research associate, Department of Plant Biology, University of Minnesota, and MNNPS member. This article is modified from his book, *The Pollination Biology of North American Orchids*, vol. 2. Springer, New York (2012).

Aplectrum hyemale (Muhl. ex Willd.) Nutt. is chiefly an orchid of moist, shady deciduous forests dominated by sugar maple, basswood, beech, and red oak. It often occurs scattered in dense aggregations and shows a preference for rich, fine-textured, loamy and slightly alkaline soils.

Capable of withstanding a wide variety of climatic conditions, it ranges from Minnesota, southern Quebec and Massachusetts to Oklahoma and Georgia; in Minnesota it is restricted to the southeastern quadrant of the state. The present account provides summary information on the genetic compatibility, breeding system, pollination mechanisms, and fruiting success of this orchid.

Leaf measurements suggest that plants must attain some minimum size before flowering, and only one or two individuals from aggregates of 100 or more may flower in a given year. In a pioneering two-year study in east central Illinois, Kevin Hogan, from the University of Illinois, Urbana, found that *Aplectrum* is fully self-compatible at the level of fruit production and that the flowers can self-pollinate (autogamy) and possibly, produce seed asexually (agamospermy)



***Aplectrum hyemale* (Putty-root) inflorescence. Photo by David G. Smith (www.delawarewildflowers.org/), used with permission.**

with no loss in seed production or viability (no inbreeding depression).

Although fruit set occurred in over 80 percent of flowers that were left to be pollinated naturally (open pollinated), pollinators were rarely seen. Only about one out of 50 flowers was visited during a five-day flowering period. The frequency of insect visits to *A. hyemale* was only about 1/4000th of what other scientists recorded at the same site for earlier blooming spring ephemerals. The difference cannot be accounted for by the fact that the flowers of *A. hyemale* produce no nectar — the visitation rates among nectarless spring ephemerals were much higher. It may relate, however, to a decrease in pollinator

availability between the blooming period for *A. hyemale* and the earlier blooming spring ephemerals.

Freshly placed pollen from another flower was never observed on the stigma. In fact, 26 hours of observation over four days revealed only about 12 individuals of the short-tongued bee, *Lasioglossum oblongum* (Lovell) visiting the flowers. Most merely landed on the inflorescences, remaining for up to one-half minute. Only five entered flowers. Each entered only one and remained about five seconds. None were observed bearing pollen either before or after the flower visit.

In one case, a bee dislodged the anther-cap, and although no pollen was removed, two pollen masses were observed to be in contact with the stigma following the bee's departure. Thus, insect-facilitated self-pollination could be a factor. Although gene flow through pollen may occur, the available data do not confirm any actual transfer of pollen between plants, and in Hogan's opinion, *A. hyemale* is routinely autogamous and perhaps, agamospermous. The very limited pollinator visitation rates in this species may have favored selection for autogamy. Another worker, Paul Catling, has also reported autogamy in Illinois and Canadian populations of this orchid.

The usual sequence of events leading to pollination was the same in open-pollinated inflorescences and inflorescences enclosed to exclude pollinators. The pollen sacs were covered by the anther-cap in newly opened flowers. On the first or second day the cap dropped off, laying bare the pollen.

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Iron Horse Prairie SNA Field Trip

by Steve Eggers, U.S. Army Corps of Engineers.

On Aug. 25, 19 botany enthusiasts met at what the Minnesota DNR website describes as the largest contiguous example of mesic tall-grass prairie remaining in Southeast Minnesota. A prairie saved, by happenstance, where two 19th century railroad tracks met and created a 35-acre triangle south of Hayfield in Dodge County.

Because it was railroad land, the acreage was never plowed and was basically forgotten until a Minnesota DNR prairie inventory of railroad rights-of-way discovered this gem long after the tracks had been abandoned.

Now purchased and managed as a Scientific and Natural Area, it is a jewel for prairie enthusiasts and supports populations of an impressive number of threatened [T], endangered [E], and special concern plant species [SC]:

wild quinine (*Parthenium integrifolium*) [E], rattlesnake master (*Eryngium yuccifolium*) [SC], tuberous Indian-plantain (*Arnoglossum plantagineum*) [T], common valerian (*Valeriana edulis* var. *ciliata*) [T], Sullivant's milkweed (*Asclepias sullivantii*) [T] and small white lady's-slipper (*Cypripedium candidum*) [SC].

I led a MNNPS field trip to Iron Horse SNA in the 1990s during the same time period. Temperatures were around 100 degrees F. and, being a prairie, there was no shade. Heat exhaustion was a constant concern with determining how long to keep the group out. This year it was a pleasant 70 degrees F. with light overcast. For photography, light overcast is preferred over bright, mid-day sun as harsh shadows are avoided. And, this being a botanically-oriented excursion, there were plenty of photographers. A good time was had by all, to my knowledge.

Participants interested in primers on grasses and goldenrods were not disappointed. Six species of goldenrods were in bloom: Riddell's (*Solidago riddellii*), stiff (*S. rigida*), gray (*S. nemoralis*), giant (*S. gigantea*), Canada (*S. canadensis*) and grass-leaved (*Euthamia graminifolia*). Grasses included big bluestem (*Andropogon gerardii*), Indian grass (*Sorghastrum nutans*), Canada wild-rye (*Elymus canadensis*), prairie cord-grass (*Spartina pectinata*), prairie dropseed (*Sporobolus heterolepis*), Canada blue-joint grass (*Calamagrostis canadensis*), narrow reedgrass (*Calamagrostis stricta*), Kentucky blue-grass (*Poa pratensis*), reed canary grass (*Phalaris arundinacea*) and redtop (*Agrostis gigantea*).

Also encountered was the opportunity to distinguish the common milkweed (*Asclepias syriaca*) from the threatened Sullivant's milkweed. The former is a hairy plant with very warty seed pods, while the latter is a waxy smooth plant including the seed pods, except for a few warts. Two gentians were in bloom, adding deep blue and lavender colors to the prairie patina — bottle gentian (*Gentiana andrewsii*) and stiff gentian (*Gentianella quinquefolia*).

Some of the large forbs had flowered poorly, perhaps due to the dry conditions and high temperatures preceding this point in the growing season. Nonetheless, we found a few good examples of wild quinine and rattlesnake master in bloom.

It was a treat to see state-listed species growing side-by-side, such as tuberous Indian-plantain and common valerian. Common valerian was abundant, even dominant, growing across the moisture gradient from wet-mesic to mesic prairie. Its



Sullivant's milkweed, photo by Steve Eggers.



Steve Eggers taking photo of Sullivant's milkweed (*Asclepias sullivantii*). Photo taken by Arlene Kjar on field trip.

range in Minnesota is limited to the southeastern portion of the state, from the lower Minnesota River Valley to the Iowa border. Is the Iron Horse SNA population of common valerian the largest in Minnesota?

At the time of our visit, knee-high to waist-high aspen (*Populus tremuloides*) shoots were present in a good portion of the prairie. Prescribed burns are an essential component of managing Iron Horse SNA to prevent aspen and other woody species from taking over. The next prescribed burn will set back the aspen, and the competition between prairie grasses/forbs and woody plants will march inexorably on.

Thanks to the Minnesota DNR, and the inadvertent preservation by the railroad system, we have this spectacular prairie to enjoy today.



Bottle gentian (*Gentiana andrewsii*), photo by Steve Eggers.



Seed pod of wood lily (*Lilium philadelphicum*), photo by Arlene Kjar.

Implement new prairie plan now, state leaders say

Tom Landwehr, commissioner, Minnesota Department of Natural Resources, and John Jaschke, executive director, Minnesota Board of Water and Soil Resources, are urging immediate implementation of the new Minnesota Prairie Conservation Plan. (This plan was described in the Summer 2012 issue of *Minnesota Plant Press*.)

The plan, which was finalized this past summer, identifies common goals among conservation organizations. It will serve as a road map for protecting, restoring and enhancing prairies for the state's primary conservation organizations. It is designed to achieve these conservation goals by:

- Permanent protection of grasslands via easements and acquisition of critical lands from willing sellers;
- Restorations, including buffer strips, native plant seeding, wetland restoration and water-level management; and
- Enhancement of prairies and grasslands through prescribed fire, conservation grazing and invasive species control.

In addition, Landwehr and Jaschke said, "we need to seek opportunities to incorporate conservation into 'working lands' — like grazing lands — so conservation can contribute directly to local economies and agricultural lands. ... Let us act now for a future where we can visit the Prairie Region and be proud to have saved our grassland legacy — and the economic and conservation benefits it supports — for many future generations."

View the plan on the Minnesota DNR website: www.dnr.state.mn.us/prairierestoration/index.html

Pollination biology Continued from page 3

On the third or fourth day, the pollen was displaced, and fleshy, white lobes covered the stigma. The generation of these lobes was the result of contact between the stigmatic surface and the displaced pollen. Catling, indeed, described a 270-degree rotation of the pollen sacs onto the stigma following degeneration of the anther cap.

Patches of this orchid are said to be clonal. If so, the genetic variability resulting from autogamy (or agamospermy) would approximately equal that resulting from pollen transfer within populations, and fruit-set could be increased with no additional reduction in genetic diversity. At the same time, the limited genetic variability reported for *A. hyemale* by several authors is not surprising in a species with a breeding system based on clonal growth and autogamy rather than outcrossing. Limited variability would, in turn, be consistent with the absence of any significant diversification in this monospecific genus.

Master Naturalist program honored

The Minnesota Master Naturalist program was named "Program of the Year" recently by The Alliance for Natural Resource Outreach and Service Programs.

The Minnesota DNR and the University of Minnesota Extension Service jointly sponsor this program. To date, more than 1,000 volunteers have been trained. To learn more, visit www.minnesotamasternaturalist.org

Book Review

New Upper Midwest aquatic plant guide is published

Aquatic Plants of the Upper Midwest: a photographic field guide to our underwater forests, by Paul M. Skawinski. The guide can be purchased from Paul Skawinsk at lakeplants@yahoo.com; Amazon.com; or the University of Wisconsin Lakes Program: www.uwsp.edu/cnr/uwexplakes/publications

Review by Scott Milburn.

In Minnesota, we are reliant upon focused texts like *Trees and Shrubs of Minnesota* and the recently published *Native Orchids of Minnesota* or the standard dichotomous keys. Often, exposure is essential to learning the flora, and sometimes it is nice to have some type of field guide that points the user in the right direction. Botanical field guides can be a great way for readers to introduce themselves to a specific group of plants or even to a new region where the most common plants are unfamiliar to the user.

Aquatic species in particular can be difficult to learn, due to the habitat itself and inability to see the plants in hand. It is not often that I find myself with a net or a rake that allows the collection of aquatic material, plus my tendency is to focus on terrestrial plants and dry feet. There are such technical keys as the *Aquatic and Wetland Plants of Northeastern North America*, but this is not likely something to pack away in a backpack.

Paul Skawinski, a Wisconsin botanist, has released a second publication on aquatic plants titled *Aquatic Plants of the Upper Midwest*. This is a 174-page field guide that covers Minnesota, Wisconsin, and Michigan. The guide is organized by morphological groupings, which makes it easy to narrow one's focus. As with the author's previous publication, *Aquatic Plants of Wisconsin*, the guide includes a brief description of each species and color photographs. The layout and all of the photographs were done by Paul. The photographs are

very useful in showing the various diagnostic features and usually include a nickel to indicate scale.

The initiative required to produce this self-published guide is astounding, and I am very impressed with Paul's knowledge on the subject. As with most other botanical texts and field guides, modifications and updates are inevitable. Perhaps the future edition can include distribution maps for all three states and additional keys.

Is that plant native?

by Arthur Haines, research botanist. This is the introductory section of his article in the Spring 2012 issue of *New England WILD*, the magazine of the New England Wild Flower Society, and is published here with their permission.

The flora of New England can be defined as a list of plant species that grow in the region outside of cultivation. This list of wild plants is dynamic. Changes to the list of species found in the region are the result of many factors, including climate, intentional and unintentional introductions, species interaction, and site alterations, among many others. Since the settlement of this continent by Europeans, a large number of plants have been added to the regional flora. It is estimated that one-sixth of the North American flora is non-native. Interestingly, the additions have hailed from several continents

(not just Europe), a result of global trade and travel.

It is sometimes necessary to determine those species that are native to a region and those that are non-native. This is vitally important when deciding which species will have conservation efforts applied to them. It is also important when sites are to be planted. Using native species helps insure plants will not be invasive at a site, although this is not a guarantee.

Native is frequently defined as those species that were present prior to European settlement. This definition has many difficulties, including the fact no comprehensive surveys were performed before this time. Further, it can be difficult to use on a state level because it offers no guidelines for how to deal with movements of species that have long grown in North America (it is much better applied to continents as a whole).

President's column

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other potential issues that conflict with our mission.

It is my goal as president to educate and bring about awareness of critical issues. We do not need to have balanced discussions — only fair and accurate. It is also essential to continue with the science and natural history focus that the membership enjoys.

Archive programs

We have had great programming over the years, and it will continue. We are also looking at how to archive all of these great programs. That has become an issue for our members that are outside of the Twin Cities. We have the financial resources to develop this, and the board will have to determine how best to do this.

Taxonomy notes

Why tree names are 'girls'

by Shirley Mah Kooyman, botanist and MNNPS vice president.

In botanical Latin, plant names consist of a genus and a species epithet. The specific epithet, an adjective describing the genus, has to match in gender with the genus, a noun. The concept of matching genders exists in languages such as Spanish, Italian, French, Dutch and others. However, in English it doesn't exist, so it is a foreign concept to grasp.

Once that is understood, botanical Latin becomes a very useful tool for plant names. As in Latin, the general rule is: male = "us," neuter = "um," female = "a" (examples: *Elymus virginicus*, *Allium stellatum*, *Hepatica acutiloba*).

But you'll notice that generic names of trees don't seem to follow those rules. The genera (plural of genus) don't match in gender with their specific epithets (examples: *Fraxinus americana*, *Morus rubra*). So the question is: Why is that?

In Latin the rules are: Names of most rivers and mountains (unless they end in "a" or "e") are masculine. Most countries, islands, cities and trees are feminine. Here's a little rhyme to aid with remembering that:

A woman, island, country, tree
and city feminine we see:

Penelope, Cyprus, Germania,
laurus, Athenae.

It turns out that Carl Linnaeus (creator of the binomial system) kept some of the classical tree genera instead of creating new ones, even though they ended in "us." Remember that trees in Latin are feminine, regardless if the genus has a masculine ending. This is the reason why tree names are "girls."

Plant Lore

by Thor Kommedahl

What is swamp lousewort?

Lousewort is *Pedicularis lanceolata* in the snapdragon family. Because lousewort is hemiparasitic on species in the aster family, native grasses, and more, some have classified lousewort in the broomrape family (root parasitic herbs).

How did it get its names?

Lousewort refers to lice, and the genus name for lice is *Pediculus*. *Pedicularia* means "of lice." It was once believed that cattle grazing on this plant became covered with lice. Wort implies that this plant was once used in medicine. *Lanceolatus* means leaves are narrow and tapered at both ends.

What does the plant look like?

Petals are yellow with short upper lips, and flowers bloom August to October. The narrow leaves are smooth and often opposite. Stems are somewhat four-angled and hollow. The fruit is a capsule.

Where does it grow?

This native perennial grows in wet, calcareous meadows, swamps, and shores. Its distribution in Minnesota is in east-central counties.

Is it edible or medicinal?

The Iroquois Indians ate leaves cooked like spinach. There is no known medicinal use of swamp lousewort; however, plants contain digitalis-like alkaloids and are potentially dangerous for animals. Lousewort in forests (*P. canadensis*) was used by Potawatomi Indians as a physic.

Does it have any economic or ecologic uses?

It can be planted in bog gardens. Because of its selective parasitism, it can reduce populations of sedges (*Carex*) and some grasses to foster diversity within habitats.



Swamp lousewort (*Pedicularis lanceolata*), photo by Peter Dziuk.

Field trips are being planned

Ken Arndt, field trip chairman, is planning a fall field trip. Details were not complete at press time. For current information, check "Field Trips" on the website: www.mnnps.org

Ken is considering several suggested field trips for next spring and summer. The most ambitious idea is to take a small group to the Patterned Peatlands in northern Minnesota. The mile-long boardwalk in the Big Bog State Recreation Area might be incorporated into this trip. Lodging could be in Waskish.

Timing would be when the maximum number of orchids are blooming. The bog has long been a source of medicinal plants for the Ojibwe Indians. Rare plants include yellow-eyed grass, bog rush and two kinds of sundews,

Would you be interested in this field trip? Do you have suggestions for other trips? Let Ken know. Contact him at ken.arndt@mnnps.org

Minnesota Native Plant Society
P.O. Box 20401
Bloomington, MN 55420

Fall 2012

Dakota Lodge, Thompson County Park
1200 Stassen Lane, West St. Paul, MN 55113



Directions:

Take Highway 52 to the Butler Ave. E. exit in West St. Paul.
Go west on Butler 0.2 mile to Stassen Lane.
Go south on Stassen Lane to Thompson County Park.