



Minnesota Plant Press

The Minnesota Native Plant Society
Newsletter

Volume 13, No. 2

Winter 1994

Upcoming Monthly Meetings

335 Borlaug Hall—7:30-9 PM

February 2.

Dave McLaughlin (UM Plant Biology):
*Mushrooms and Minnesota Old Growth
Forests*

Plant-of-the-Month: Mark J. Leoschke,
shooting star (*Dodecatheon meadia*).

Board Meeting: 6 PM, Student Center.
Announce slate of candidates.

March 2.

Char Bezanson (St. Olaf College, Biology):
*School Nature Area Project (SNAP): Out-
reach to Minnesota Schools; field trip in-
troduction; annual meeting.*

Board Meeting: 6 PM, Student Center, set
plant sale date; hold annual meeting and
election of Board members. Deadline for ar-
ticles for spring issue. Finalize details of
Symposium for March 19.

April 6.

Scott Zager (DNR County Biological Sur-
vey): *Plant Geography of the Minnesota
Blufflands.*

Plant-of-the-Month: Douglas Owens-Pike,
bearberry (*Arctostaphylos uva-ursi*).

Board Meeting: 6 PM, Student Center.

May 4.

Photo contest show; plant sale.

Board Meeting: 6 PM, Student Center.

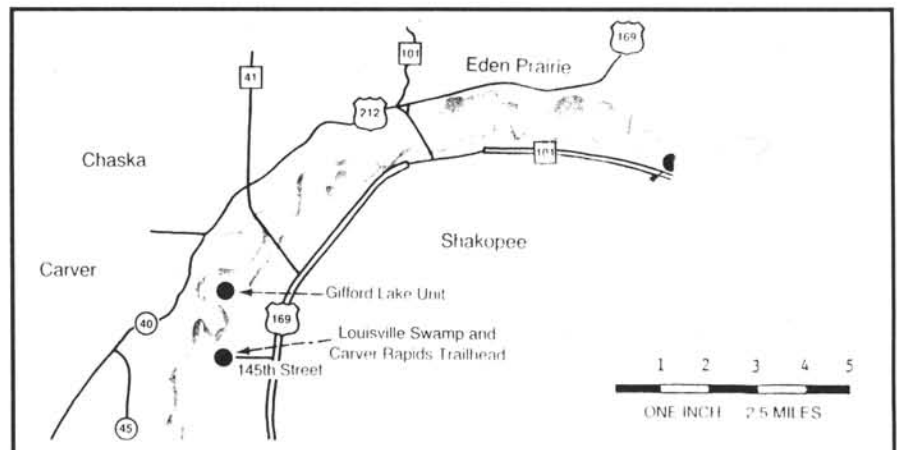
*Plan to attend the symposium on
March 19, 1994*

Volunteer search for endangered native species at the Minnesota Valley Wildlife Refuge was not stopped by the flood last spring

Mary Stanley

On June 19th, 1993, as the Minnesota River was overflowing its banks, 15 intrepid volunteers from the Twin City area and Iowa gathered at the Louisville Swamp Unit of the Minnesota Valley Wildlife Refuge to do a 4-day plant survey. The group was to look specifically for the endangered species *Besseyia bullii* (kitten-tails). This survey was sponsored by the Garden Club of America as part of their "Partner for Plants" project—a national effort by The Garden Club of America to encourage and support volunteer efforts for endangered plant work on federally managed public lands.

The first area surveyed was the Little Prairie Loop area adjacent to the parking lot and interpretive display at the end of 145th Street off Highway 169, about 4 miles north of Jordan (see map). Scattered throughout this upland area were small rock outcroppings where the soil was very shallow. These outcrops showed significant amounts of prairie species, including *Amorpha canescens* (leadplant), *Besseyia bullii* (kitten-tails), *Campanula rotundifolia* (harebell), *Dalea purpurea* (purple prairie-clover), *Delphinium virescens* (prairie larkspur), *Gentianopsis procera* (lesser fringed gentian), *Geum triflorum* (prairie smoke), *Hedyotis longifolia* (bluets), *Lespedeza capitata* (bush-clover), *Lithospermum* (continued on page 2)



(continued from page 1, Stanley)

canescens (hoary puccoon), *Psoralea argophylla* [= *Pedimelium argophyllum*] (silvery scurf-pea), *Sisyrinchium campentre* (blue-eyed grass), *Viola pedata* (bird's-foot-violet), and *Viola palmata* (wood violet).

Some of the prairie grasses encountered were *Andropogon gerardii* (big bluestem), *Bouteloua curtipendula* (side-oats grama), *Muhlenbergia* spp. (muhly grass), *Schizachyrium scoparium* (little bluestem), and *Sorghastrum nutans* (Indian grass).

Along the rocky edge of the bluff that overlooked the river valley, small populations of prickly-pear cactus were located. That view of the Louisville Swamp under 10 feet of water was impressive. In its place was a huge lake that covered many hundreds of acres.

Although this first area surveyed was quite degraded and had many introduced species, it has the potential for management to enhance and improve the quality of the site.

The Carver Rapids Unit was also surveyed (see map). In the northeast section, a large population of *Opuntia fragilis* (little prickly-pear) was found. The individuals and clusters of stems (183) were located at the edges of partially exposed boulders. This population is very likely one of the largest in the state. The southern portion of the Carver Rapids Unit was a less disturbed area but it had the most diverse species, including *Corallorhiza maculata* (spotted coral-root), which is normally a species of the Arrowhead Region of Minnesota.

The third area that was looked at was a small section adjacent to the Chicago & Northwest Railroad at the farm parking area. This location was the least disturbed of all the areas surveyed and showed the best examples of oak savanna vegetation.

If you want to learn and recognize some of our native prairie species, visit this area very close to the Twin Cities and spend some time with your field guides. Happy hunting!

Mary Stanley has been a longtime fan of native plants and has grown her own prairie garden. She is active in the Garden Club of America, and the Minnesota Landscape Arboretum, and she serves on its Board.

Spring Field Trips

1) **WARBLERS AND WILD-FLOWERS.** TNC Nerstrand Big Woods Park Tour. Wednesdays, April 20, 27; May 4: 7:30 to 9:30 AM.

Join Kim Chapman and Nancy Falkum, Minnesota Chapter of the *Nature Conservancy*, for a walk in Nerstrand Big Woods State Park to see early spring ephemerals and migrating songbirds. Meet at the picnic/parking area. **Phone reservations are required.** Call Julie or Janet at . Wear waterproof shoes and clothes.

2) **LICHENS OF THE ST. CROIX VALLEY.** Interstate State Park, Taylors Falls. Saturday, April 23; 10:30 AM to noon.

Explore the fascinating lichens that grow in the pothole area of Minnesota's Interstate State Park, with lichenologists Jim Schuster and Nancy Albrecht. Meet in front of the Interpretive Center. **Phone reservations are requested** by calling Jim at

, or Nancy at (after 6 PM). Wear sturdy walking shoes.

3) **NATIVE PLANT NURSERY AND PRAIRIE TOUR.** Crow-Hassan Park Reserve, Hennepin Parks. Saturday, May 7: 9 AM to 1 PM.

Join John Moriarty of Hennepin Parks for a tour of the native plant nursery in the Crow-Hassan Park Reserve, and to a restored prairie in the park to search for early spring forbs. Meet at the Crow-Hassan Nursery. **Phone reservations are requested.** For directions and reservations, call . Wear appropriate clothing and shoes.

Optional equipment for all three trips include cameras, binoculars, hand lens, and field guides.

No fees are required except daily or annual parking permits.

Summer field trips will be announced in the Spring Issue of *Minnesota Plant Press*.

—Nancy Albrecht

The fenced area of the Eloise Butler Wildflower Garden's Upland Prairie will be increased by 1 acre to make this area 20% larger, pending Park Commission approval—*The Fringed Gentian* 43[4], 1993

The Minnesota Native Plant Society

Minnesota Plant Press
Thor Kommedahl, editor

Newsletter of the
Minnesota Native Plant Society

Membership dues are \$10 per year for regular members and includes subscription to the newsletter; dues for students and seniors are \$8, for family \$12, for institutions \$20, and donors \$25. Checks can be made out to: Minnesota Native Plant Society, and sent to: Minnesota Native Plant Society, 220 Biological Sciences Center, 1445 Gortner Avenue, St. Paul, MN 55108.

Three issues are published each year.

MNPS Board of Directors

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Prairie Recreation and Management in Hennepin Parks

Hennepin Parks personnel have been planting and managing prairies since 1968. Prairie recreation now exceeds 650 acres in 7 parks. The largest planting is in Crow-Hassan Park Reserve with 540 acres. Some plantings are small and designed as interpretive prairies and prairie gardens.

The recreation process has evolved from hand broadcasting of out-of-state tree seed to the use of Truax seed drills with locally collected seeds. Hennepin Parks currently uses 6 species of grasses and 75 species of forbs in prairie plantings. Plantings vary from 2 to 70 acres.

The quantities of seeds and plants used are not appropriate for home prairies but the techniques are applicable. First, all vegetation should be removed from the site, either with an herbicide or by hand. Second, grass and forb seeds should be sown in mid-June. Forb seeds should be sown on the soil surface, whereas grass seeds should be raked into soil. If the site is small, the proportion of grass should be reduced to allow forbs to dominate. Seedlings, mainly species difficult to start from direct seeding, are planted after the seeding is done. Seedlings must be watered and protected from browsing for the first growing season. During the first 2 years, noxious weeds should be controlled. Prairies take years to mature, so be patient. Additional forbs can be added over the years by broadcast seeding or by adding seedlings, especially after grasses have matured (5-6 years).

Hennepin Parks manages its prairies with controlled burns on a 2-4 year rotation, in spring. Herbicides are used selectively to control invasive weeds such as leafy spurge, thistle, bird's-foot-trefoil, and crown vetch. Handpulling is effective in small areas.

Additional information on Hennepin Parks' prairies is available from: John Moriarty,

Summary of October Meeting Presentation at MNPS by John Moriarty, Wildlife Specialist for Hennepin Parks.

Butterfly Habitats: Native Plants in Gardens and Natural Areas

Wildflowers, in nature or in a garden, are beautiful and rewarding. An entomologist appreciates wildflowers also for their role in attracting butterflies, bees, beetles, flies, and other insects. Many species of butterflies are attracted to nectar, in particular, but their larvae feed on vegetative parts. Planting a "butterfly garden" is an increasingly popular activity.

Many butterfly species are attracted also to mud (presumably for minerals such as potassium and calcium), dung, urine, and rotting fruit. A "home brew" can be made by mixing brown sugar, beer, and molasses. Shrubs serve as perching sites for males to await females. Butterflies are less picky about plant species than most gardeners are, e.g., thistles or hoary allysum are more attractive to butterflies than to humans.

A "tongue-in-cheek" butterfly garden consists of a good mud puddle, coyote droppings around the edge, beaver urine and castor, squashed bananas, a few hazel bushes for perching, and lots of thistles. A more neighbor-friendly garden would include butterfly-weed, and rough blazing star. The latter species is a butterfly magnet, especially for monarchs migrating south. Other choices are any milkweed, prairie blazing star, joe-pye weed, ironweed, and various asters.

But why not observe butterflies in the wild? Actually, I have mixed feelings about "butterfly gardens." Sure, they will attract butterflies and reward the gardener. They could also help educate a youngster or entophobic adults about butterflies. But could one duplicate something like Iron Horse Prairie, or the Kellogg-Weaver Sand Dune area? Will dozens or even thousands of individual scattered butterfly gardens ever benefit butterflies?

So, plant an area specifically with butterflies in mind. But then explore roadsides, parks, prairies, preserves, or the DNR Scientific and Natural Areas, and see butterflies in their natural habitats. Help protect natural areas, for when they disappear, no number of butterfly gardens will replace them.

Summary of December Meeting Presentation by Dean Hansen, Entomologist.

Please renew your membership in Minnesota Native Plant Society now

There is still time to renew your membership and receive the big Spring issue of the MNPS Newsletter. Your continued support is important in the effort to build awareness of our Minnesota native plants and to let people know about the Society and the work it does to foster interest in our native species.

The year your membership is paid *through* is typed on your address label on the Newsletter. You can renew your membership today by mailing your check to MNPS. Membership fees and the mailing address are given in the box on page 2, column 3. Or, you can renew your membership at the next monthly meeting.

The Minnesota Native Plant Society appreciates your membership support and your participation.

Display Board of MNPS

All members are welcome to show our outstanding display board at events, museums, and schools, provided that there is an attendant or it is safely displayed. With information on the Society, native plants, and stewardship, the double-sided board is 3 feet by 3 feet. To schedule use, call Don Knutson at

Photo contributors were listed in the Fall Issue; however some contributor names were omitted. The sentence should have read "*Most slides were generously supplied by Rick Haug with some from May Wright, Janet and Janice Robidoux, Linda Huhn, Diane Hilscher, Audrey Engels, and Dianne Plunkett.*" Thanks to each of you!

SYMPOSIUM: *Native Plants and Their Interactions with Other Organisms*, March 19, 1994, at Earle Brown Center, St. Paul Campus. Registration 8:30 AM. Sessions from 9 AM to 3 PM.—D.M. Knutson, Program Chair

Pollination notes on Minnesota orchids: heartleaf twayblade

Charles Argue

One of only three species of *Listera* known to occur in Minnesota, the heartleaf twayblade (*L. cordata* [L.] R. Br.) is a common but inconspicuous and often overlooked orchid of moist northern woods and cold balsam-cedar-spruce bogs, but is also found in thick, rather dry moss mats on headlands and in spruce-fir forests on the north shore of Lake Superior.

From early spring to mid-July, it bears small, light green to purple flowers in long slender racemes. The lip or labellum of each flower is flattened, bent sharply downwards from a point near its insertion (Fig. 1A), and is notched at its tip (Fig. 1B). In the center of the flower is the small column, a specialized structure that includes the anther, the stigma, and accessory elements (Fig. 1D). The anther (Fig. 1C) is positioned behind a large, thin, leaf-like structure called the rostellum (Fig. 1C). It dehisces in the bud and two club-shaped pollinia (Fig. 1C) are released and held unattached on the broad rostellum, enfolded by its incurved margins. The downward pointing labellum serves as a landing platform for visiting insects. A minute amount of nectar is secreted into a superficial groove, the nectar groove, which runs down the center of the labellum (Fig. 1B). The insect, feeding on the nectar, crawls slowly up the labellum until its head contacts the rostellum. In some instances, at least, proper orientation of the insects in relation to the column also involves taking nectar from a nectary on the basal disc just beneath the column. When any of three small trigger hairs on the base of the rostellum are touched (Fig. 1C), an adhesive, held under pressure, is forcibly ejected onto the head of the insect, and the rostellum is immediately reflexed, releasing the pollinia onto the drop of rostellar glue. The glue dries in several seconds, and the pollinia are firmly attached to the head of the insect. The pollinia lack the short stalks present in some orchids which twist to align them with the stigmatic cavity of the next flower. Instead, about a day following discharge of the pollinia, the rostellum folds upward, freeing the passage to the receptive stigma (Fig. 1D), which has now become very sticky. Nectar is resecreted into the nectar groove, and if another insect that has visited a younger flower and has pollinia cemented to its head makes its way up the labellum as before, the pollinia will contact the stigma and pollination will occur. Because only fragments of the pollinia are left behind on the stigma, a single insect may pollinate several flowers with a single set of pollinia.

Although *L. cordata* is self-compatible, it is not usually self-fertilizing. The pollen grains of some species of *Listeria* have been reported to dry-out and a few, perhaps because of the activity of thrips, can become detached from the pollinia and contact the stigma, effecting self-pollination. The same process, apparently in the absence of thrips, may occur in *L. cordata*. Differences in the coherence of pollen grains, however, suggest that their disassociation is less likely to occur in *L. cordata* than in most other species of *Listera*.

Although fertilization between two flowers on the same

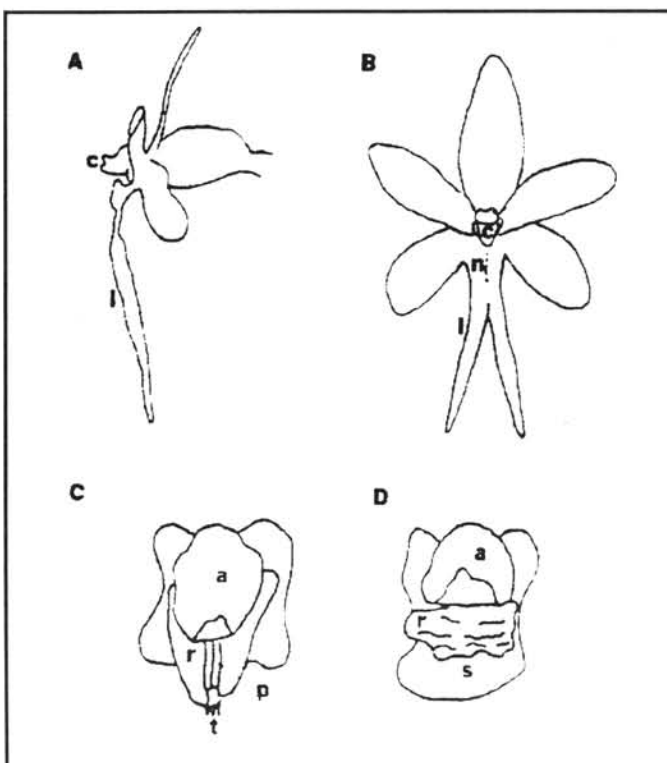


Fig. 1. Floral diagrams of *Listera cordata*: A- flower side view; B- flower face view; C-Column; D-Column, rostellum retracted [a-anther, c-column, l-lip, n-nectar groove, p-pollinia, r-rostellum, s-stigma, t-trigger hairs].

plant is possible, many of the insects implicated in the pollination of this species are said to work from the bottom to the top of the racemose inflorescence. Younger flowers near the top of the inflorescence have exposed pollen and covered stigmas, older flowers near its base have exposed stigmas. This combination of factors promotes cross pollination of the older, basal flowers.

Insects are attracted to the flowers of *L. cordata* by their odor and nectar. The labellum apparently secretes nectar in all species of *Listera*, but the flowers of some species are said to be scentless. The odor in *L. cordata* is fetid, and a similar odor is produced by some other species. Nevertheless, the flowers of *L. cordata*, at least, do not appear to be pollinated by insects normally attracted by the odor of decaying flesh nor does it deceive its pollinators by mimicking the odor of their larval foods.

The larval pollinators of *Listera* are thought to be nectar-seeking wasps and primitive flies. The nectar is well exposed, and the pollination mechanism is simple and can be operated by many small insects. In studies done in Europe, ichneumonids are said to be attracted in large numbers to the flowers of *L. ovata*, as are beetles and other insects. Beetles are generally con-

(continued on page 5)

Pollination Notes (from page 4)

sidered ineffective pollinators, but have been reported to be competent in *Listera*. Even some predatory insects, e.g. *Chlorophyta torrentium*, usually destructive to flowers and generally associated with primitive blossom types, are recorded as pollen vectors of *L. ovata*. Bees will visit the flowers casually for nectar. Visual clues, however, are apparently inappropriate for proper orientation, and they are not considered effective pollinators.

Fungus gnats are by far the most common pollinators of *L. cordata* in the redwood forests of northern California; however, this may be a local phenomenon related to the abundance of these insects. Members of other insect groups have been seen carrying pollinia, and no adaptation to a specific pollinator is evident. The fungus gnats orient themselves more or less randomly with respect to the column while taking nectar from the labelum, but when feeding on the nectar secreted from the nectar disc just beneath the column, they usually position their heads toward the column, and the pollinia are, therefore, most often attached to their heads.

Although the behavior of flies, wasps, and beetles is often considered erratic, fruit set in *L. cordata* is higher than that recorded for temperate, terrestrial, nectariferous orchids pollinated by butterflies, bumblebees, moths, and syrphids. Thus *Listera*, thought by Darwin to have one of the most refined flower types among the orchids, provides an example of a genus that has evolved specialized flowers but is, nevertheless, efficiently pollinated by relatively unspecialized insects. The significant feature here is the exposed nectar, which allows the utilization of the flower by a variety of insects with primitive mouth parts.

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Dr. Charles Argue is an Honorary Research Associate in the Department of Plant Biology at the University of Minnesota, St. Paul. His PhD was earned at the University of Minnesota. He taught in Central College, Iowa.

Wild Heritage of Garden Plants

Collectors have been importing interesting species to gardens since Queen Hatshepsut brought plants from Somalia to Egypt in 1495 BC. The botanical riches of North America similarly dazzled Europeans in gardens of Spain, England, and France. By selection and hybridization, English and German horticulturists improved plants for garden use, e.g. phlox, michaelmas daisy, sneezeweed, and lupines.

The michaelmas daisy, *Aster novi-belgii*, was brought to England where it was called "starwort." Ballard developed the cultivar Beauty of Colwale in 1907, which led to others. Current interest is in developing turtlehead, phlox, blue-eyed grass, and others.

Summary of November meeting of MNPS by Prof. Anne Hanchek, Horticultural Science, University of Minnesota, St. Paul.

Minnesota Orchids: Such a Deal!

Orchids of Minnesota, written by Welby Smith and illustrated by Vera Wong—both MNPS members—is now in print. This well-written book has beautiful photographs and drawings of our native gems. It is available in bookstores for \$25. The University of Minnesota Press, however, has made a special offer to members of the Society. Copies of this book can be purchased through the Society for only \$13. The first order sold out at the December meeting of MNPS, and the book generated so much interest that a second order will be placed. Checks for the book(s) must be made out to the *Minnesota Native Plant Society* and mailed to Mark J. Leoschke, 5817 73rd Avenue North #134, Brooklyn Park, MN 55429 (612/566-2333[home]; 551-2481[work]) by February 1, 1994. The Society's order will then be placed with the Press. Books will be available for distribution at the March meeting of MNPS, and at the Native Plant Symposium. Members may also arrange to pick up their books at some other time. We thank the University of Minnesota Press for this wonderful opportunity!

—Mark J. Leoschke

Leedy's roseroot found only in Minnesota and New York

Leedy's roseroot (*Sedum integrifolium* ssp. *leedyi*), a federally listed threatened species, is a plant found only in Minnesota and New York. The Minnesota Department of Natural Resources and the US Fish and Wildlife Service recently published a booklet about this plant entitled *Leedy's Roseroot, A Cliffside Glacial Relict*. Written by Natural Heritage Botanist Nancy Sather, and published in 1993, the booklet describes the plant, its habitat, and threats to it, and it is illustrated with excellent color photographs. Copies may be requested from Zella E. Ellshoff, Botanist, Division of Endangered Species, US Fish and Wildlife Service, 1 Federal Drive, Fort Snelling, Minnesota 55111; telephone 612/725-3276.

—Z.E. Ellshoff

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