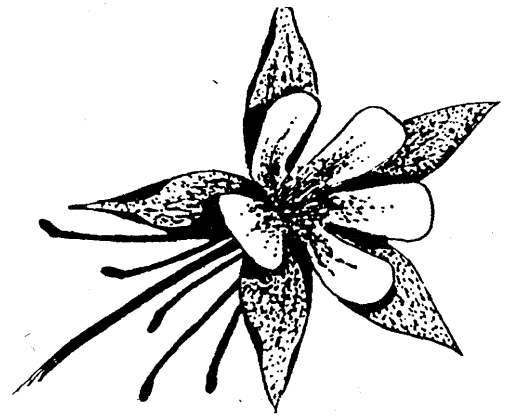


Aquilegia



Newsletter of the Colorado Native Plant Society

"... dedicated to the appreciation and conservation of the Colorado native flora"

Volume 20 Number 1

January-March 1996

Botanical Notes from the Arkansas Valley II: the Ecology of *Oxybaphus rotundifolius*

Tass Kelso, Kirsten Heckmann,
John Lawton, and George Maentz
Dept. of Biology, Colorado College

Increasing concern about development in the Arkansas River Valley and its potential impacts on local biota has brought much needed attention to the botany of this region. Thanks to funding provided by the Colorado Natural Areas Program and the Colorado Native Plant Society, this summer we were able to examine closely some of the endemic calciphiles of the Middle Arkansas with the intent of providing a profile of their habitat requirements. *Oxybaphus rotundifolius* (umbrella-wort), a striking member of the Nyctaginaceae previously known from only a few locations widely scattered between Cañon City and Pueblo, received particular attention in our study. Technical assistance from members of the Geology and Chemistry Departments at Colorado College enabled us to conduct detailed geochemical assessments of *Oxybaphus* habitat; we hoped that this information, coupled with the extensive geological information available for the area, would elucidate the distribution of this species and help us predict the occurrence of new populations. We also studied known *Oxybaphus* populations to identify and document biological components of its ecology: pollinator types and dependency, predation, and seed set. Our profile is summarized here.

Reproduction

In general, *Oxybaphus rotundifolius* populations had an excellent year, probably due in part to an unusually wet spring. Plants bloomed abundantly from early June through late July, with peak bloom in late June.

Umbrella-wort flowers open at dawn and close in response to temperature: on cool cloudy days they can remain open into the late afternoon, but on hot sunny days they close by 9:30 or 10:00 a.m. Typical of the Nyctaginaceae, each inflorescence contains 3-4 flowers subtended by a papery involucre. Since each flower has but a single ovule, seed set per involucre is only 3-4 at best. However, most flowers set seed, enabling some of the larger plants (almost 2 feet tall this year!) with many involucres to produce potentially more than 300 seeds.

We discovered that this species is highly self-fertilizing, with seed set under insect

enclosures equaling seed set in open pollinated plants. However, seed predation by insects may be responsible for relatively low actual reproductive success: we found ant thieves making off with seeds on a frequent basis! We also documented extensive herbivory of leaves and inflorescences by hornworms. Reared hornworm specimens pupated and emerged as white-lined Sphinx moths, *Hyles lineata*. Positive insect interactions were also noted: we captured pollinators of several types ranging from bumblebees to Syrphid flies, all carrying *Oxybaphus* pollen. Though self-fertile, this species is clearly also a facultative outcrosser.

Habitat

We consistently found *Oxybaphus rotundifolius* in sparsely vegetated shale and chalk barrens that correspond to the middle and upper units of the Smoky Hills member of the Niobrara Formation. A single population deviated from this pattern and was found on the Fort Carson exposure of Ft. Hayes

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From the Board of Directors

Statewide Representation on the Board of Directors

Do you think that the Society's board should have a broader representation? The roster (pg. 2) shows that the majority of the Society's Board of Directors live along the Front Range, mostly in the Fort Collins and the Denver Metropolitan area. In response to comments, the Board has discussed ways of increasing representation from other parts of Colorado. Several ideas have emerged: 1.

Create two or more regions across the state, each with board representatives. 2. Change the process for electing board members so that all members, not just those who attend the annual meeting, can vote. This could be done with a mail-in ballot. 3. Hold board meetings throughout the state. 4. Hold the annual meeting somewhere other than the Front Range. 5. Gather ideas and comments from the membership. If you have comments, concerns or other ideas about how the Board can best represent statewide con-

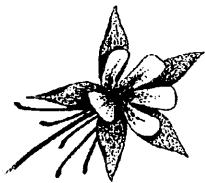
cerns, please write to Mark Gershman at the Society's mailing address. You can also send your comments via E-mail to: (gershmanm@ci.boulder.co.us).

Nomination for Board Members

Although the annual meeting is still several months off, the Nominations Committee is starting to gather nominations for the Board. Nominees should be members of the Society willing to serve as an officer, Committee

- continued on following page

Colorado Native Plant Society



The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado native flora. Membership is open to all with an interest in our native plants, and is composed of plant enthusiasts both professional and non-professional.

Please join us in helping to encourage interest in enjoying and protecting Colorado's native plants. The Society sponsors field trips, workshops and other activities through local chapters and statewide. Contact the Society, a chapter representative, or committee chair for more information.

Schedule of Membership Fees

Life	\$250
Supporting	\$ 50
Organization	\$ 30
Family or Dual	\$ 15
Individual	\$ 12
Student or Senior	\$ 8

Membership Renewal/Information

Please direct all membership applications, renewals and address changes to the Membership Chairperson, Colorado Native Plant Society, P.O. Box 200, Fort Collins, CO 80522. Please direct all other inquiries regarding the Society to the Secretary at the same address.



Aquilegia is published four to six times per year by the Colorado Native Plant Society. This newsletter is available to members of the Society and to others with an interest in native plants. Contact the Society for subscription information.

Articles from *Aquilegia* may be used by other native plant societies or non-profit groups if fully cited to author and attributed to *Aquilegia*.

Newsletter Contributions

Please direct all contributions to the newsletter to:

Nina Williams
976 Cherryvale Road
Boulder, CO 80303
E-Mail: NCybele@aol.com

Short items such as unusual information about a plant, a little known botanical term, etc. are especially welcome. Camera-ready line art or other illustrations are also solicited.

Please include author's name and address, although items will be printed anonymously if requested. Articles submitted on disks (IBM or Mac) are appreciated. Please indicate word processing software and version.



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President	Tom Ranker	492-5074
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and	Kathy Carsey	449-3041
Editorial	Nina Williams	499-9858
and	Tamara Naumann ..	374-2504
and	William A. Weber ..	492-6171
Education	Andrew Kratz	238-6317
Field Trips	Rick Brune	238-5078
and	Jeff Dawson	722-6758
Field Studies	Lorraine Yeatts	279-3427
Hort/Restoration	Tina Jones	794-2647
and	Ann Armstrong	494-0545
Legislative Affairs ..	VACANT	
Membership	Myrna Steinkamp ..	226-3371
and	Sue Martin	226-3371
Publicity	VACANT	
Workshops	Bill Jennings	666-8348

Board, continued from page 2

Chair or take some other active role in the business of the Society. Every year there are five available positions on the Society's Board of Directors. The ten directors serve two year terms. Directors are asked to attend approximately five or six meetings from September through May—usually on Saturday afternoons. If you are interested or want more information, please contact a member of the Nominations Committee (Tom Ranker, Carol Spurrier or Mark Gershman) by June 1. Society members who have indicated their interest on the membership renewal form will be contacted to confirm their availability.

NOTE: BOARD MEETING RESCHEDULED

The March 2nd Board Meeting has been rescheduled to March 9th at 1:00 p.m. at the City of Boulder Open Space Office, 66 S. Cherryvale Rd., Boulder. All are welcome.



NEXT AQUILEGIA DEADLINE APPROACHES

Please submit all newsletter contributions for Volume 20 No. 2 to Nina (see page 2 for address) by April 10. Any artwork representing San Luis Valley flora or ecology would be particularly useful.

Aquilegia

is printed on 100%
recycled paper

LOST AND FOUND

A Hamilton Bell dissecting kit was left at the Foothills Nature Center during Miriam Denham's Trichomes Workshop. To retrieve, call Bill Jennings at 666-8348.

ANNOUNCEMENTS

1996 ANNUAL MEETING TOPIC SET

As natural habitat becomes increasingly scarce, the need to restore and rehabilitate disturbed ecosystems becomes more and more critical. Restoration and reclamation will be the theme for the 1996 Annual Meeting. Society members can look forward to an exciting meeting focused on using native plants in plant community restoration. This broad topic ranges from restoring poor condition plant communities to reclaiming completely denuded sites. Issues to be considered include: site evaluation and preparation, native plant selection, seed collection and propagation, transplanting, weed control, erosion control, genetic considerations, to fertilize or not to fertilize, and much more.

Dr. David Buckner has graciously agreed to chair a committee to organize the annual meeting. The first organizational meeting will be at 12:00 p.m. on March 9th at the City of Boulder Open Space Office, 66 S. Cherryvale Road. The Society Board meeting will follow at 1:00 p.m. If you are interested in helping on the Annual Meeting Committee, or have ideas/input and cannot attend this meeting, please call David at (303) 447-2999.

REVISED FLORAS COMING!

William A. Weber has been busy adding new species, distributions, and the latest taxonomic considerations to the *Colorado Flora: Eastern Slope* and *Colorado Flora: Western Slope*. Look for the revised second editions in April and keep up with the latest!

XERISCAPE COLORADO PLANT TESTING PROGRAM

To encourage development of a network of gardeners interested in advancing horticulture that is better adapted to local growing conditions, Xeriscape Colorado is starting a WaterWise Plant Testing Program. For an enrollment fee of \$15.00 participants will receive: (1) a one-year membership in Xeriscape Colorado (including 6 issues of *WaterWise*), (2) a rain gauge, and (3) a collection of six plants to be tested in the garden. Participants will grow the plants in their gardens and will be provided with plant forms on which to record data on soil, altitude of garden, irrigation, natural precipitation, and daily temperature ranges. Results of the program will be reported annually in *WaterWise*. One of the plant collections — "Only-in-Boulder" — will be plants native to Boulder County. For more information call Jim Knopf at (303) 494-8766 or Dianne Andrews at Sunflower Gardens (303) 823-6779.

"50 Years with Boulder County Plants"

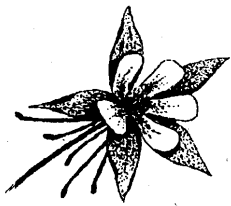
Dr. William A. Weber will present the same lecture on two different occasions:

- Wednesday April 24, 7:00 p.m. at the University of Colorado at Boulder Museum, Dinosaur Room.
- Monday, April 15, Colorado State University Colloquium of Life Sciences. Please call CSU Fort Collins Biology Dept. for time and location.

HEALING HERBS EXHIBIT

"Healing Herbs", a year long exhibit on medicinal plants, will open at the University of Colorado Museum on July 18, 1996. The exhibit will be in the Henderson Building at 15th and Broadway, just north of the University Memorial Center. The museum is open Friday 9-5, Saturday 9-4, and Sunday 10-4 (closed on holidays). For more information call (303) 492-6892. The Boulder Chapter of the Society has proposed planting a native medicinal herb garden in conjunction with the exhibit. The proposal is under review by the university. To help with this effort call Anna Hopkins (303) 786-9622 or E-mail her at: anna.hopkins@colorado.edu.

ANNOUNCEMENTS



In Memoriam
Anne Green Maley

Anne Green Maley, an active member of the Colorado Native Plant Society, died at her home in Boulder on January 6, 1996. Anne was an enthusiastic botanist with a deep appreciation for Colorado's natural landscapes. She educated herself about Colorado's plant communities and used this knowledge to help preserve them. The Colorado Native Plant Society's workshops provided Anne an opportunity to study difficult plant groups in greater detail while sharing in the camaraderie of fellow Colorado botanists.

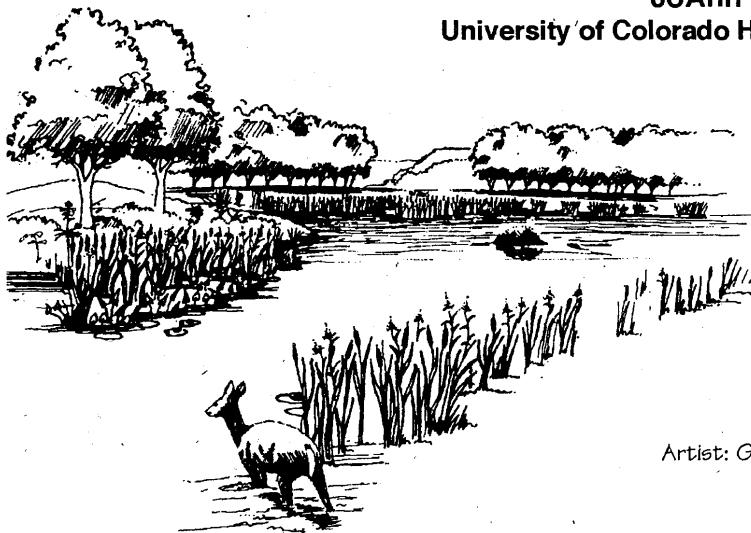
Anne received a bachelor's degree from Oberlin College in Ohio and a master's degree in biology from the University of Colorado in Boulder. Schooled more as a zoologist, her interests later turned to botany. When her daughters were young, Anne and her family spent many weekends at Camp LaForet in the Black Forest of Colorado. She began a collection of plants in the Black Forest and over the years became well-acquainted with the area's flora. For a number of summers she taught plant identification classes for the Elder Hostel at Camp LaForet. Anne's collections, along with others of the area, taught her about the rare, unusual, and disjunct species unique to the Black Forest. In 1994 the University of Colorado Museum published her study, *A Floristic Survey of the Black Forest of the Colorado Front Range*, in its Natural History Inventory of Colorado Series. She hoped that this study would spread knowledge about the value of the area and help protect it from further development and loss of valuable plant species.

Anne's volunteer contributions also included a study of *Viola pedatifida* (birdfoot violet) for The Nature Conservancy and numerous plant inventories, collections, and guided hikes for the City of Boulder Open Space and Boulder County Parks and Open Space Departments. It was always an honor and a pleasure to work with Anne and learn from her astute taxonomic skills.

Anne is survived by her husband, Sam, and two daughters, Karen and Laura. She will be missed by the many botanical friends she made in Colorado.

Contributions in Anne's memory may be made to the Society's John Marr Fund or the Colorado Nature Conservancy.

JoAnn W. Flock
University of Colorado Herbarium

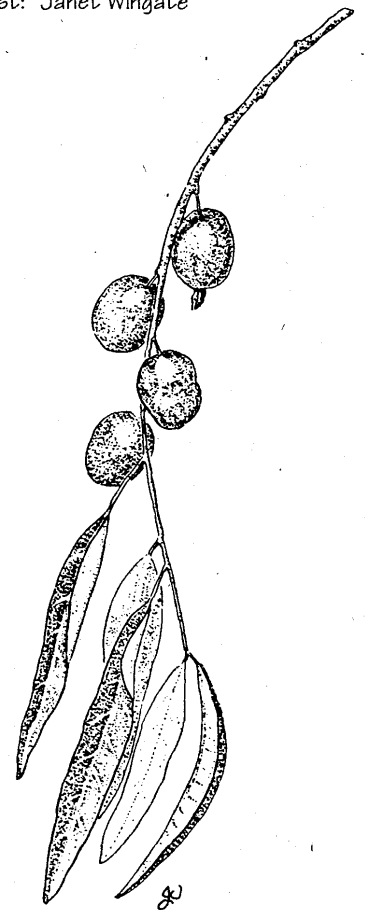


Artist: Gary Bentrup

UPDATED HORTICULTURAL
HAZARD LIST AVAILABLE!

The Horticulture/Rehabilitation Committee has revised the **Plant Species Not to Use in Gardening, Reclamation and Restoration** List originally prepared by the Boulder Chapter of the Society. This list includes invasive forbs, grasses, shrubs and trees which threaten or potentially threaten natural areas, agricultural lands and gardens. Many of these species are available commercially and promoted for garden and reclamation use. To receive a copy, send a self-addressed stamped envelope to Ann Armstrong, Chair, Horticulture/Rehabilitation Committee, 5653 Baseline Rd. Boulder, CO 80303.

Eleagnus angustifolia
Artist: Janet Wingate



Comments on "The Resurrection of *Penstemon versicolor*"

Frank R. Stermitz

Department of Chemistry, Colorado State University

Tass Kelso and John Lawton (*Aquilegia*, October-December 1995) suggest that the *P. secundiflorus* populations at 1400-1700 m. on calcareous shales of the Arkansas Valley, with basal leaves obovate, should be given Pennell's name *P. versicolor* to distinguish them from other populations with basal leaves lanceolate. They quote other differences, but this is perhaps the most obvious one to an amateur such as myself. The article was of interest since we recently completed and published chemical analysis of a population, apparently typical of the obovate basal leaf taxon, from south of Pueblo near Burnt Mill, in which we compared this with a high altitude collection of *P. secundiflorus* with basal leaves lanceolate. (In the key to species presented by Kelso and Lawton, the range of *P. secundiflorus* is designated as "1500-2700 m E slope foothills of the Front Range." Yet in his *Colorado Flora Western Slope*, Weber states that it occurs on the western slope on Cochetopa Pass. Further, among the 63 *P. secundiflorus* specimens in the Colorado State University Herbarium, there are several collected from 9300-10,200 ft, or 2700-3000 m.)

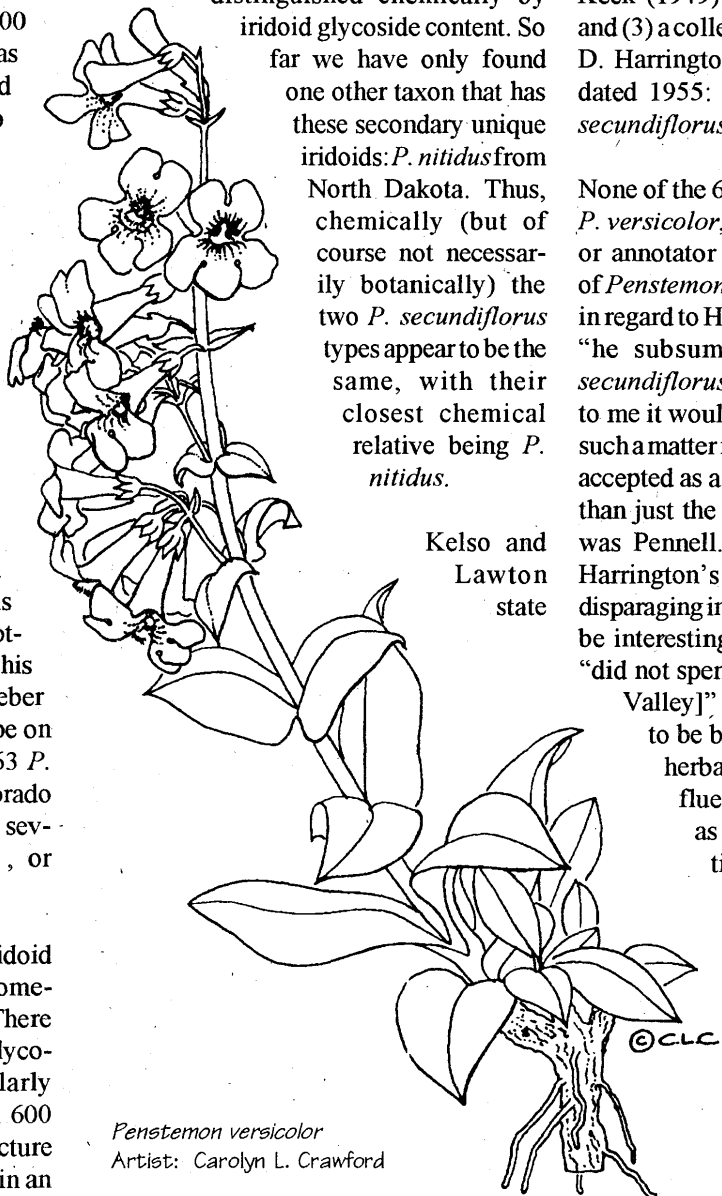
Our chemical analysis was of the iridoid glycoside content, a type of chemical sometimes used for taxonomic purposes. There are now perhaps 600 different iridoid glycosides known and they are particularly common in the Scrophulariaceae. All 600 iridoids have a common molecular structure in which two parts are joined together in an L shape. As a consequence, two hydrogen atoms at the bottom left of the L are next to each other on the same side. In the ovate-leaved *P. secundiflorus* from Burnt Mill we found an iridoid glycoside (the first out of 600 known) that has the hydrogen atoms on opposite sides, with the two halves of the L flattened out to almost 180° rather than 90° to each other. This remarkable compound has been found in no other of the several thousand iridoid-containing plant species that have been studied but it is also present in

the lanceolate *P. secundiflorus* from high altitude in central Colorado. There are other secondarily rather unique iridoid glycosides in both *P. secundiflorus* collections; the two taxa or populations therefore cannot be distinguished chemically by iridoid glycoside content. So far we have only found one other taxon that has these secondary unique iridoids: *P. nitidus* from North Dakota. Thus, chemically (but of course not necessarily botanically) the two *P. secundiflorus* types appear to be the same, with their closest chemical relative being *P. nitidus*.

Kelso and Lawton state

(1949), by F. S. Crosswhite (1969), and by Craig Freeman (1981), (2) a collection from Burnt Mill south of Pueblo by J. H. Christ in 1935 labeled *P. secundiflorus* and verified as such by C. W. Penland (undated), D.D. Keck (1949) and F. S. Crosswhite (1969) and (3) a collection from the same area by H. D. Harrington (1954), with an added note dated 1955: "sure looks different than *P. secundiflorus* around Fort Collins."

None of the 63 specimens contain the name *P. versicolor*, either as used by the collector or annotator (many highly knowledgeable of *Penstemon*). Kelso and Lawton comment in regard to Harrington's Colorado flora that "he subsumed *P. versicolor* under *P. secundiflorus*, without discussion." It seems to me it would only be necessary to discuss such a matter if *P. versicolor* had been widely accepted as a species name by more experts than just the author of the name, even if it was Pennell. Kelso and Lawton attribute Harrington's non-use of *P. versicolor* to the disparaging influence of W. Penland. It would be interesting to know how Penland (if he "did not spend much time [in the Arkansas Valley]" and had "notes [which] appear to be based on seeing relatively little herbarium material") could have influenced such experts in *Penstemon* as Keck and Crosswhite (in addition to his supposed influence on Harrington). If he indeed saw little herbarium material, at least he saw the Christ specimen in the Colorado State Herbarium from the important Burnt Mill site as shown by his annotation [(3) above].



Penstemon versicolor
Artist: Carolyn L. Crawford

that their treatment was based only on specimens from the Colorado College and University of Colorado herbaria, but there are many interesting specimens (63 total) of *P. secundiflorus* in the Colorado State University herbarium. Three of the most interesting (among many which should be consulted) are (1) a collection by C. S. Crandall in 1890 of what he called *P. acuminatus*; annotated as *P. secundiflorus* by P. A. Rydberg (undated), by D. D. Keck

Luckily, there is now the possibility that more light than heat can be placed on questions such as these (through comparative DNA analysis), but we still need to convince someone to undertake the necessary study. Analysis of plant secondary metabolites (such as iridoid glycosides), although no longer a very important player in taxonomy, is still an interesting way of determining how genetic diversity may (or may not) influence chemical diversity and can help define problems in need of solution.



Oxybaphus, continued from page 1

limestone that lies immediately below the Smoky Hills layers. All sites have the same general character: low angle slopes, a surface layer of small rock fragments, and underlying deep fines. Associated species vary; no single one can be used as a predictor. Although more abundant than *O. rotundifolius*, *Penstemon versicolor* (see *Aquilegia* Volume 19 No.4), is one of the most reliable sympatric species.

Some of our most intriguing results came from the geochemical analysis of test sites. With X-ray diffraction of soil samples, we looked for presence of gypsum in soils, a factor suggested as critical to the unique flora of the Arkansas Valley in some botanical literature. We found, however, that gypsum is only sporadically present in these soils, a result consistent with the known geological information. Consequently, we suggest that the shale endemics of the Arkansas Valley should not be considered obligate gypsophiles, although they are almost certainly strongly or obligately calciphilic.

Additional analysis

with an inductively coupled plasma spectrometer examined the cation composition of soils. Preliminary data show that *Oxybaphus* sites are unusually low in iron and manganese, and rather high in the heavy metals cadmium and vanadium. Does this mean that unusual geochemistry explains the distribution of this species? Perhaps, but not necessarily! Mycorrhizal associations may enable *Oxybaphus* to exist in low nutrient sites without competition from other more aggressive species. But, soil chemistry may be a byproduct of the stratigraphy, with physical aspects of habitat more critical determinants of flora. Does insect predation

prevent *Oxybaphus* from being more abundant than it is? We don't yet know the answers to any of these questions, but they suggest new avenues of exploration to help us to understand Arkansas Valley endemism.

Distribution and New Populations

Combining information from the geological literature, geological maps, and topographic maps helped us predict and find the occurrence of several new populations. We feel

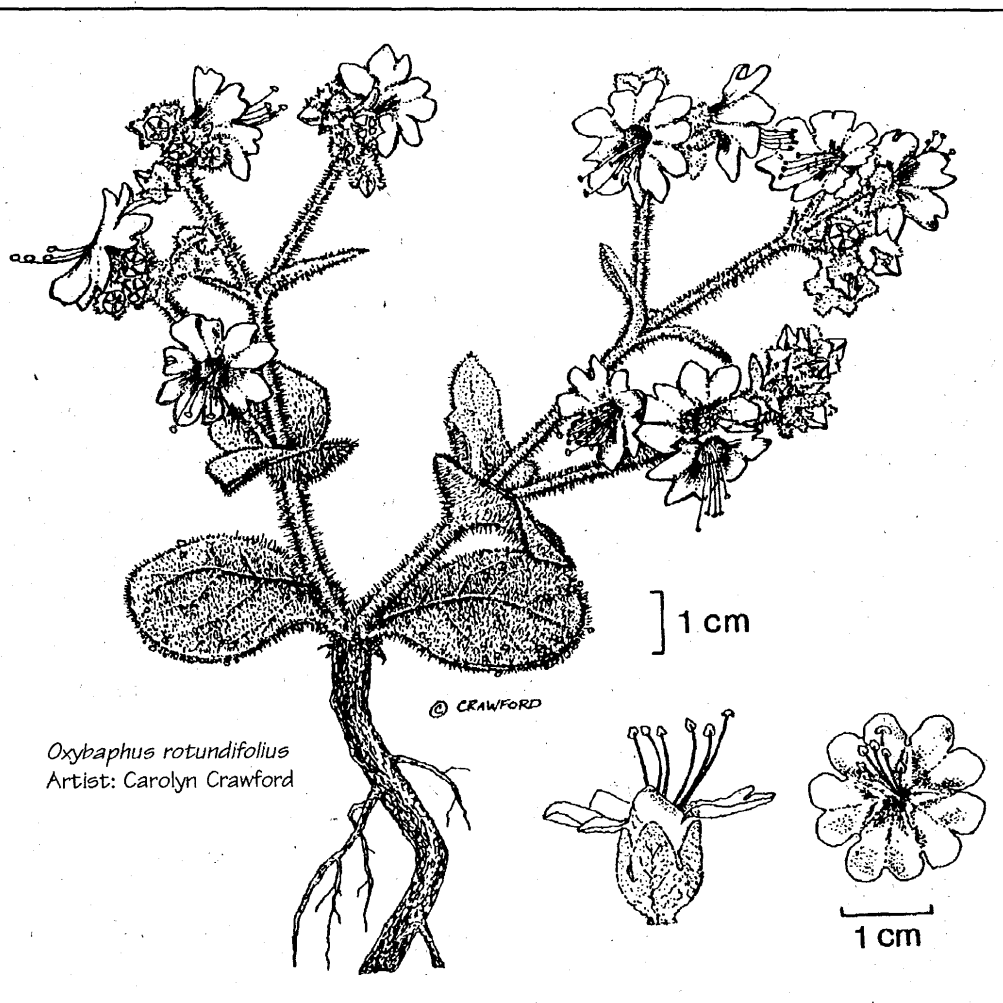
Middle Arkansas Valley. Dave's work suggests that we should expand our search considerably to the south, perhaps as far as New Mexico! This southern population had some intriguing aspects: it was found on Greenhorn Limestone, not Smoky Hills, and it had some hybrid genes showing the influence of another common species, *Oxybaphus hirsutus*. Nyctaginaceae expert Richard Spellenberg has indicated that *O. hirsutus* has a complex taxonomic situation due to its

tendency towards hybridization and inbreeding, and its influence is widely felt in the genus.

Conclusions

While our studies this summer reassure us to some extent about the validity of the adage "the more you look, the more you find," we still find reasons to be concerned about the loss of biological diversity in the Arkansas Valley. Development and human impact is expanding rapidly. We come away with the sense of how much there is yet to learn about this part of Colorado, from taxonomy to ecological interactions. Initiating a process to protect biologically

representative sites here should have a priority rating for state conservation groups. We see a great need for an outreach program to inform private landowners and agency representatives about the unique aspects of the local landscape. We urge those doing biological exploration in the Arkansas Valley not only to continue their efforts, for we need all the information we can get, but also to be sensitive to local land issues. Tactful ambassadorship may prove to be one of our best investments for the preservation of the rich biota of this region.



Oxybaphus rotundifolius
Artist: Carolyn Crawford

very encouraged about the status of *Oxybaphus rotundifolius*: while not abundant, it is much more common than previously believed. In addition we have identified vast areas with the requisite substrate and topographic qualities as yet unsurveyed. Thanks to Dave Anderson from the Directorate of Environmental Compliance at Fort Carson, several new populations, both small and large, were found in previously unsurveyed land at Fort Carson. Even more exciting was his discovery of a disjunct population in the Purgatory drainage at the Piñon Canyon Maneuver Site, far beyond the previously known range in the



SPRING WORKSHOPS — 1996

NOTE: Due to unforeseen circumstances, Dr. Gregory Brown's workshop on *Haploppapus* is cancelled.

NEW!

THE BELLFLOWER FAMILY: CAMPANULACEAE

Leader: Robin Bingham

Location: University of Colorado - Boulder

First session: Saturday, March 16, 1996

Second session: Sunday, March 17, 1996

Due to a scheduling conflict with a trip to Brazil, Dr. Gregory K. Brown has had to cancel his workshop on the genus *Haploppapus*. On short notice, Robin Bingham has agreed to do a workshop on the Campanulaceae. In this workshop, she will cover the members of the Campanulaceae known to occur in Colorado, as well as some taxa occurring nearby in neighboring states. In addition, she will discuss the unusual method of pollen presentation in the Campanulaceae and will present some interesting aspects of bellflower pollination ecology. Robin is currently completing her doctoral dissertation, "Pollination Ecology, Reproduction, and Patterns of Gene Flow in Populations of *Campanula rotundifolia* at Elevational Extremes," at the University of Colorado at Boulder.

SAXIFRAGES

Leader: Dr. Douglas E. Soltis

Location: University of Colorado - Boulder

Date: Saturday, April 6, 1996

Our second out-of-state workshop leader is Dr. Douglas E. Soltis of Washington State University, who will lead a workshop on the Saxifrages. Dr. Soltis did his doctoral research on genus *Sullivantia*, which has one representative on the western slope in Colorado (*S. hapemanii*). A tight schedule prevents Dr. Soltis from presenting two sessions, so attendance at the one session will be limited to only 22 persons! Dr. Soltis will also present a lecture on the saxifrages on Friday evening, April 5, at Morrison Center, Denver Botanic Gardens, where he will discuss the latest research on the Saxifrages. Seating is limited, so be sure to register for the lecture, too.

To register, or for more information.....

The Colorado Native Plant Society workshop series was established in 1985 to provide members with wintertime activities when field trips are impractical. Workshops bring native plant lovers together with a well-informed instructor who may have herbarium specimens, live plants, photographs, identification keys, and other materials available for hands-on study. The opportunity to receive one-on-one instruction and informative lectures has made the workshop series one of the most popular Native Plant Society programs. Attendees need no special skills or background; a love of plants and a desire to learn are the only prerequisites. There are no exams, grades, or homework, and working together is encouraged. The goal is to demystify plant identification and to enhance in all of us our enjoyment and understanding of Colorado's native flora.

Bill Jennings has reassumed his position as workshop coordinator. A dedicated telephone line has been installed at Bill's home to take workshop registrations. Please call 665-6903 (a local call in metro Denver-Boulder, area code 303 for long distance) and leave a message on the answering machine. You may also register by mail, P.O. Box 952, Louisville, CO 80027. Be sure to provide your name, address, telephone number (including area code!), and which workshops you wish to attend. If multiple sessions are scheduled, be sure to indicate preference. Receipt of your registration request will be acknowledged within a few days.

About 10 days prior to the workshop, registrants will receive notice by mail regarding location, time, lunch, references, and sup-

plies, with a list of other registrants to encourage carpooling. The fee for each workshop is \$10 for CoNPS members and \$22 for non-members (\$10 workshop; \$12 to join the society). Payment is made on the day of the workshop.

Workshops have been very popular in the past, with multiple sessions frequently scheduled to meet demand, or with long waiting lists for the seats available. However, no-shows have been a problem. There are only so many seats available in the classrooms and labs where these workshops are held, and we are holding a seat for you. If you find that you CANNOT attend a workshop for which you are registered, please call and cancel your registration as soon as possible!



CONPS Field Trip Policy

The Society wishes to remind field trip participants of the guidelines for participation in Society trips. By joining a CONPS field trip you indicate acceptance of these policies.

1. Plant collecting is forbidden on CONPS field trips, with two exceptions:

(1) Collecting is permissible for scientific study (with the appropriate collecting permit, if one is required for the area in question).

“Scientific study” means, for the purposes of this policy, study by a trained botanical scientist with an expectation that the study results will lead to published information; collected specimens will be deposited in a recognized, publicly-accessible herbarium.

(2) A trip leader or other person whose responsibility is to instruct trip participants may collect plants for immediate demonstration, explanation, or keying for full identification.

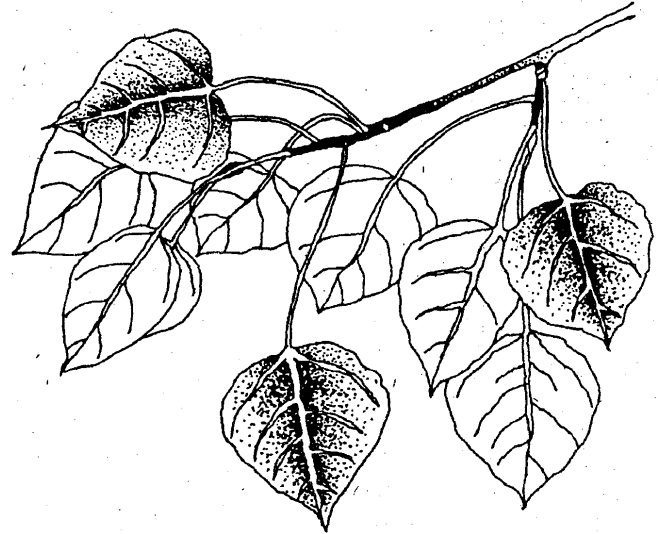
Such collecting should be done inconspicuously (so that persons not with the trip group are not offended or motivated to do likewise), and with reasoned regard for any possible effect on the plant population. However, collecting of rare, threatened, endangered or sensitive species should never be done for instructional purposes.

2. Rides and Cost-Sharing Policy: Car-pooling and ride-sharing are encouraged on CONPS trips. All drivers who provide rides to others will graciously accept payment from passengers according to the following scale:

- 1 passenger (in addition to driver) 5 cents per mile



Asclepias uncialis
Artist: Carolyn Crawford



Aspen: Populus tremuloides
Artist: Barbara Bash

- 2 passengers 4 cents per mile
- 3 passengers 3 cents per mile
- 4 passengers 2 cents per mile

Passengers should pay the driver at the conclusion of the trip, without being asked.

3. Pets are NOT permitted on CONPS field trips.

Pets trample plants, disturb wildlife, and annoy other trip participants. If pets must be brought along (although this is strongly discouraged), they must remain in or restrained to the owner's vehicle (i.e. walking about on a leash is NOT acceptable).

4. Field trips are designed primarily for adults, unless the trip description specifically states otherwise.

Parents should consider the appropriateness of a given trip to a child. If a child is brought, the parent assumes full responsibility for keeping the child under strict control to prevent his/her damaging or disturbing the flora or fauna, or becoming a burden to the group. No child unaccompanied by a parent is permitted.

5. CONPS' expressed purpose is to promote appreciation and preservation of our flora. Please tread lightly.

Take care not to damage the very features you have come to see and enjoy. Take photographs, sketches, or other means of recording the plants you see, and do not pick plants or plant parts.

6. Field trip participants MUST sign a waiver of liability.

FIELD TRIPS — 1996

PLANTS AND PETROGLYPHS IN NORTHWESTERN COLORADO

Leader: Tamara Naumann

Meeting Location: Dinosaur National Monument Headquarters, Dinosaur, Colorado

Saturday & Sunday, May 11 & 12, 1996, 8:30 a.m.

This trip will focus on unusual native flora and Fremont rock art characteristic of the Uinta Basin. The spectacular scenery of the Yampa and Green River canyon country will add to the experience. We will visit Raven Ridge Natural Area for a glimpse of *Penstemon grahamii*, *Bolophyta ligulata*, *Chamaechaenactis scaposa*, and other barrens plants. We'll travel to Harper's Corner to view the confluence of the Yampa and Green rivers and the famous Mitten Park fault; along the way, we'll see rock art, *Boechea fernaldiana* (*Draba juniperina*), *Fritillaria pudica*, and other high desert and piñon-juniper associates. If conditions permit, we will descend to the confluence at Echo Park where we will enjoy more rock art, *Arabis vivariensis* and possibly peregrine falcons.

Meet in the parking lot at Dinosaur National Monument Headquarters (U.S. Highway 40, 2 miles east of the town of Dinosaur, Colorado) at 8:30 a.m. on Saturday, May 11. For those interested, Tamara and Peter will host a pot-luck dinner on Friday evening at their home near the park headquarters (ask for directions when you call to register). The trip will conclude mid-day on Sunday, but Tamara will be available to guide people to additional rock art sites on Sunday afternoon.

Camping is available in the Maybell City Park for \$6 (plus \$1 for showers); there is now a nice restaurant across the street from the park. Maybell is approximately 60 miles east of Dinosaur on U.S. Hwy. 40. Blue Mountain RV park in Dinosaur provides camping and showers for \$14.50. Camping is available in the Rangely City Park for \$10 with electrical hook-up, or \$5 without. Rangely is approximately 20 miles from Dinosaur on Hwy. 64. The Echo Park campground in the the Monument is about 35 miles from the headquarters on rough roads; the cost is \$5 per night. Motel accommodations are available in Craig, Rangely, and Dinosaur.

Bring food, water, sun screen, rain gear, sturdy shoes, and both warm and cold weather clothing (the weather can be extremely variable this time of year). A checklist of the flora of the Monument and copies of *Uinta Basin Flora* will be available from the trip leader. Hiking conditions range from easy to moderate. Roads are paved, except for the road to Echo Park, which usually requires 4-wheel-drive and may not be passable if wet. Dogs are not allowed in the back country of Dinosaur National Monument.

To register, call or e-mail Tamara Naumann (970) 374-2504 (h), (970) 374-2501 (w), or Tamara_Naumann@NPS.gov. Trip limit is 20 persons.

GREEN MOUNTAIN MOONY - BOTANY FOR LUNIES

Leaders: Loraine and Dick Yeatts, Jan Wingate

Meeting Location: Green Mountain Trailhead
Saturday, June 1, 1996, 3 p.m.

Learn to identify wildflowers using your favorite key and later enjoy the rise of the full moon over Denver. This trip is planned for beginning botanists and new members who want to learn more about the local flora. (It's OK to come just to have a good time too!).

Green Mountain should be resplendent with wildflowers at this time of year. Among the over one hundred different plants present are *Castilleja integra* (Indian paintbrush), *Linum lewisii* (blue flax), *Penstemon virens* (foothills penstemon); *P. secundiflorus* (sidebells penstemon), *Lupinus argenteus* (silvery lupine), *Physaria vitulifera* (double bladderpod), *Townsendia spp.* (Easter daisies), and *Stipa comata* (needle-and-thread grass).

Trip leaders will help you identify many of these wildflowers on Green Mountain. They will also show you simple and effective strategies for identifying wildflowers and other plants of the Front Range area.

Meet at the Green Mountain Trailhead/carpark on Rooney Road on the west side of Green Mountain at 3:00 p.m. We will climb to the top of Green Mountain, a gain of about 800 feet, and walk a total distance of about 3 miles. Bring food for a mountain-top dinner and perhaps a flashlight if you stay until dark.

To register, contact Loraine Yeatts at 303-279-3427. The trip is limited to 15 people.

ORCHIDS OF ROCKY MOUNTAIN NATIONAL PARK

Leader: Phyllis Francis
Saturday, June 15, 1996

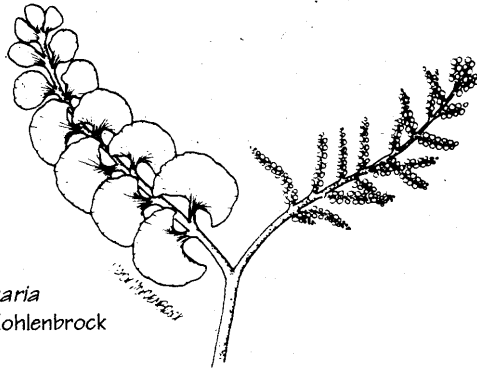
They can hide but they can't run! On this field trip, we'll seek out elusive native orchids such as the fairy slipper (*Calypso bulbosa*), brownie lady's slipper (*Cypripedium fasciculatum*), and more. We will do mostly roadside botanizing and short, easy walks.

Bring your camera and close-up equipment. There should be good opportunities to photograph these very special plants.

We'll visit Bear Lake and possibly Wild Basin. Please plan to car pool as this is a tourist-busy time for the park.

To register, contact Phyllis Francis at 303-986-1346. There is a limit of 20 people.

FIELD TRIPS — 1996



Botrychium lunaria
Artist: Mark Mohlenbrock

NEOTA WILDERNESS

Leader: Jody Nelson

Meeting Location: See directions below
Saturday and Sunday, July 27 & 28, 1996, 8 a.m.

Jody Nelson will lead two one-day field trips in the Neota Wilderness near Cameron Pass. Participants are welcome for one or both days. On Saturday we will spend the day in the subalpine, first hiking in the morning to a subalpine lake that contains the only known population of *Subularia aquatica* L. in Colorado. After lunch we will drive to another entry point and hike to some of the wetlands common in the Neota Wilderness, where we may see some *Eriophorum*, gentians, primroses, and other plants. Sunday we will hike up through the spruce-fir forests and explore fellfields and tundra meadows and enjoy the nice views.

To reach the Neota Wilderness area, take Hwy. 14 west of Ft. Collins approximately 60 miles. We will meet at the Blue Lake trailhead at 8 a.m. on Saturday. It is approximately 2 miles west of the Chambers Lake campground on Hwy. 14. From there we will drive another 7 miles on Long Draw Rd. to our first entry point. On Sunday we will meet at 8 a.m. at the Zimmerman Lake Trailhead (approximately 5 miles west of the Chambers Lake campground). Campsites are available along Long Draw Rd., at Chambers Lake, and other nearby areas in the National Forest.

Because the Neota Wilderness has no trails, participants must be able and prepared to hike cross-country through often dense forest and wetlands. Stream crossings without bridges will be necessary. On Saturday we will hike approximately 5 or 6 miles with 1000 feet of elevation gain. Sunday will be more strenuous, involving 6-8 miles of hiking and 2000 feet of elevation gain. Sturdy hiking boots (perhaps waterproof), rain gear, extra dry socks, insect repellent, and sun protection are recommended. Bring a lunch and plenty of water for each day. Nighttime temperatures are often in the 30s and daytime temperatures sometimes can reach the 70s and 80s. Limit 15 people.

To register, call Jody Nelson at (303) 465-3034. Evenings are best or leave a message during the day. You may also register by e-mail at: Jody.Nelson@sdoct.com.

GUANELLA PASS

Leaders: David Buckner and Pat Murphy
Saturday, August 3, 1996

During 1995, David Buckner and ESCO Associates surveyed the Guanella Pass road between Georgetown and Grant to identify any rare plants that would be affected by widening the road. They found a number of species of special concern and will share their finds on this field trip to this very interesting area.

During their survey, they found the moonwort *Botrychium lunaria*, a dwarf fern only an inch or two tall. They also saw several other moonworts which were too immature to identify. With enough eyes searching for moonworts on this trip, there is an excellent opportunity to document important new moonwort sites in Colorado. (And if you've never seen a moonwort, now is your chance!)

Another rare species they found is the monkeyflower *Mimulus gemmiparus* which propagates vegetatively by gemmules. With luck, we may document an expanded population.

Aquilegia saximontana also grows here along with several uncommon species of fleabane: *Erigeron elatior*, *E. melanocephalus*, and *E. pinnatisectus*.

A subalpine meadow on the south side of the pass supports the rare willow *Salix candida* and *Ptilagrostis porteri*.

Other unusual species are *Listera borealis*, *Cylactis (Rubus) arctica* ssp. *acaulis*, and the sedges *Carex oreocharis* and *C. scirpoidea*.

Although several of this year's field trips are more rigorous than in the past, everything on this trip is within a few hundred feet of the road and requires no long hikes.

To register, contact David Buckner at (303) 447-2999.

Valerian edulis
Artist: Janet Wingate



FIELD TRIPS — 1996

SNOW MESA

Leader: Janet Coles

Meeting Location: Spring Creek Pass

Saturday, August 3, 1996, 6:30 a.m.

Snow Mesa is an alpine plateau in the shadow of the Continental Divide in the eastern San Juan Mountains. Like much of the region, Snow Mesa is composed of 20-30 million year old layers of lava and volcanic ash. What makes this area interesting is that (1) it has not been botanized, (2) it was never covered by glaciers and thus could harbor disjunct plant species stranded by the end of the latest Ice Age, and (3) it includes the largest alpine wetland complex in Colorado.

Meet at 6:30 a.m. at Spring Creek Pass, on Highway 49 between Creede and Lake City. A large number of Forest Service campgrounds are available in the area—arrival the evening before is recommended. A list of roadside rare plant localities between Denver and Creede will be available for those who have time on Friday or Sunday to do some extra botanizing.

This will be a physically challenging trip. We will shuttle from the top of the pass to the bottom of the mesa, then climb cross-country 2000 feet to the top. The top of the mesa is over 12,000 feet in elevation. At this elevation and time of year, thunderstorms are a real possibility, and may include lightning, rain, sleet, or snow. Come prepared for changing weather and a long, rewarding day.

Plant collection will be allowed, using CONPS guidelines.

Useful reference materials: Baldy Cinco and Slumgullion Pass 7.5' USGS topographic maps, Rio Grande National Forest map. This is also a good opportunity to try out Sue Komarek's new book, *Flora of the San Juans: A Field Guide to the Mountain Plants of Southwestern Colorado*.

To register, call Janet Coles 303-866-3203 ext. 330. **Note: this trip could be canceled on short notice if the weather is inclement; call Janet for updated information as the trip date approaches.**



Smelowskia calycina
Artist: Janet Wingate



Psychrophila (Caltha) leptosepala
Artist: O.V. Kirkton

SAN LUIS VALLEY

Leaders: Carol Scheid and Dr. Hobart Dixon

Saturday & Sunday August 17 and 18, 1996

Explore the treasures of Colorado's San Luis Valley. This high altitude desert spans an area the size of Rhode Island. It is bordered on the east by the majestic Sangre de Cristo Mountains and by the volcanic San Juan Mountains on the west.

After a Friday evening under the stars at San Luis Lakes State Park (tent and RV campground with showers!), we will depart for an exciting day of botanizing in San Luis Valley wetlands. We'll be in search of *Cleome multicaulis*, the rare little beeplant or slender spiderflower in the Capparaceae (Caper family), and other fascinating botanical residents.

On an optional Sunday field trip, we will savor the sand, sun, and dune plants at the nearby Great Sand Dunes National Monument. Some of the same plants occur here that are found in the sandhills of northeast Colorado, including *Muhlenbergia pungens* (ring grass) and *Oryzopsis hymenoides* (Indian ricegrass). Other nearby attractions include the unique town of Crestone; the Monte Vista and Alamosa National Wildlife Refuges (seasonal home to migrating sandhill and whooping cranes) and, yes, the San Luis Valley alligator farm (that's right!).

To register and for directions, contact Carol Scheid at (970) 493-1367. This trip is limited to 15 people.

IMPORTANT: If you are planning on camping at the Great Sand Dunes, you should plan to arrive by noon on Friday to get a campsite. It fills up quickly. There is usually not a problem with space at San Luis Lakes.

FIELD TRIPS — 1996

UNCOMPAHGRE/AMERICAN BASIN WILDFLOWER HIKE

Leader: Gay Austin

Meeting Location: See below

Saturday & Sunday, August 11 & 12, 1996

The Lake City area of Colorado has a short but colorful season for high altitude wildflowers. Saturday will be spent hiking above timberline in the Uncompahgre Wilderness. We will walk a moderately strenuous 4 mile (2 up and 2 down) trail which starts at 11,440' in elevation. We will turn around at the first steep ridge leading up to the top of Uncompahgre Mountain, depending on group consensus. Sunday we will hike a leisurely to moderately strenuous 2.2 miles through American Basin to Sloan Lake southwest of Lake San Cristobal (11,300' up to 12,000'). Both of these hikes contain a wide variety of alpine vegetation and spectacular views of Uncompahgre Peak (14,309) and other peaks over 13,000'.

On the Uncompahgre Trail, the vegetation changes from a spruce-fir forest with lush meadows of corn lily, blue bells, and Thurber fescue to above-timberline alpine plant communities, and finally, alpine tundra with snow willow, arctic gentians, alpine forget-me-nots, sky pilots, primrose, and many others. The American Basin Trail also begins in spruce-fir vegetation, passes through grassy moist meadows, and then heads up to the alpine with magnificent views of Handies Peak and the surrounding wildflower-filled basin.

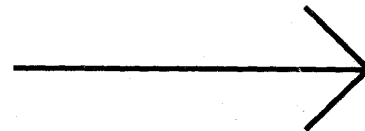
To get to the Uncompahgre Trailhead, drive about an hour (58 miles) southwest of Gunnison to Lake City then approximately 5.5 miles west of Lake City on Engineer Pass Road/Henson Creek Road to Nellie Creek Road (4 wheel drive forest Road 877). The trailhead is located 5 miles north on Nellie Creek Road (4-wheel drive Forest Road 877). A 4-wheel drive shuttle up Nellie Creek will be provided if needed (please let leader know as soon as possible). The trip will begin Saturday morning at 8:00 at the intersection of Nellie Creek Road and Engineer Pass Road.

Friday and Saturday nights we will camp at the Williams Creek Campground 9.2 miles southwest of Lake City. Drive 2.5 miles south of Lake City on Hwy. 149, turn west towards Lake San Cristobal, and travel 6.7 miles to the Williams Creek Campground and Trailhead. Hotel information in Lake City is also available from the group leader.

Plan to carry a lunch, water, and rain gear Saturday and Sunday. Sturdy hiking boots and sun protection are highly recommended. Nights may cool down to the 30s while daytime temperatures should be in the 70s - 80s (with the exception of a stormy day —knock on wood!) For more information/trip maps, please call Gay Austin at (303) 641-6264 after 6:00 p.m. or (303) 641-0471 Monday through Friday during the day.

FIELD TRIP PLANT LISTS NOW AVAILABLE!

Plant lists for 50 CoNPS field trips, dating back to 1977, are on file with the Field Studies Committee and are ready for distribution. It should be emphasized that the lists are based primarily on field observations and are not generally documented by specimen collection. Nomenclature is according to Weber and Wittman, *Catalog of the Colorado Flora*, with commonly used synonyms and common names included. Any information in the database (such as author references, common names, etc.) can be included or excluded, by special arrangement. Also, lists from repeat trips to the same region can be combined.

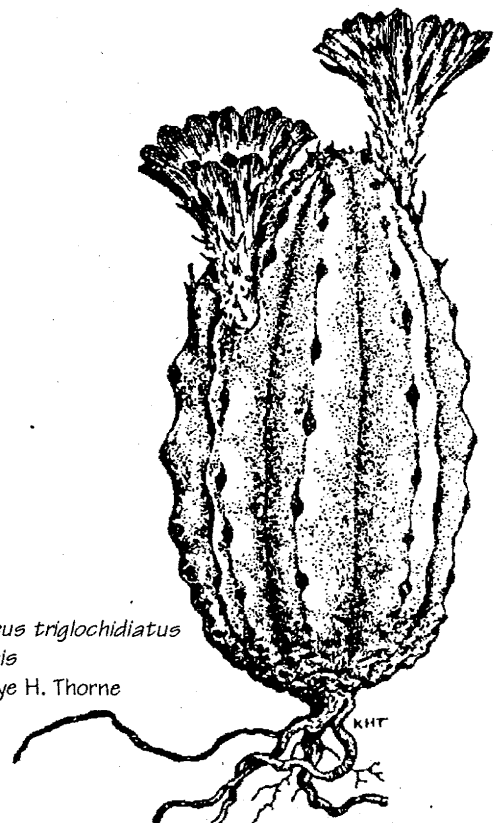


To place an order

Use a copy of the following list as an order form. For each field-trip list desired indicate:

1. trip name and date
2. format preferred (list alphabetical by family or by genus or one of each)
3. total number of pages for all lists requested.

Calculate charges based on the rate of \$.25 per page with a minimum of \$.60 if ordering fewer than three pages. Enclose a check made payable to Loraine Yeatts for the total amount of your written order and mail to her at 1395 Nile Street, Golden, CO 80401.



Echinocereus triglochidiatus
var. *inermis*

Artist: Kaye H. Thorne

Field Trip Plant Lists

(to order, see previous page)

<u>Trip Name</u>	<u>Date</u>	<u>Leader(s)</u>	<u># Pages</u>	
			<u>Family</u>	<u>Genus</u>
Aiken Canyon	06/06/1992		5	4
Billy Pardee Ranch	06/06/1990	Rick Rhoades SCS	1	1
Butler Ranch	06/06/1990	Rick Rhoades SCS	3	2
Cap Rock Preserve	05/21/1994	Terri Schulz	3	2
Cedar Mesa & vicinity	05/15/1991	Rick Brune, Loraine Yeatts	5	4
Coal Creek	05/24/1995	Mike Scott, Jonathan Friedman	2	1
Conejos River Basin	06/20/1992	Patsy Douglas	5	4
Devil's Head	08/05/1989	Judy Von Ahlefeldt	1	1
Dinosaur National Monument	05/01/1993	Lynn Riedel	4	3
East Carrizo Creek	05/21/1989	Rick Brune, Meg Van Ness	1	1
East Cottonwood Creek	05/21/1989	Rick Brune, Meg Van Ness	1	1
Enchanted Mesa	04/24/1977	Boulder Chapter	2	1
Florissant Fossil Beds	06/27/1987	Mary Edwards	4	3
Fort Carson: the Hogback	05/20/1989	Rick Brune, Meg Van Ness	2	1
Green Mt.	06/03/1995	Gayle Weinstein	2	2
High Creek Fen	07/11/1992	Alan Carpenter	2	2
Hoosier Ridge	07/17/1994	Robin Bingham	3	2
Horseshoe Cirque	07/12/1992	Barbara Siems	4	3
I-25 rest area near Pueblo	05/19/1989	Rick Brune, Meg Van Ness	2	1
Kim Area	05/21/1989	Rick Brune, Meg Van Ness	1	1
Long Lake / Niwot Ridge	07/01/1980	Miriam Denham, Jane Foley	3	2
Los Lagos Ranch, Rollinsville	07/23/1994	Betsy Baldwin	4	3
Mesa de Maya	08/22/1987	Ivo Lindauer	5	4
Middle Park	06/18/1989	John Anderson	2	1
Moffat County	05/23/1987	Steve O'Kane	3	3
Mt. Bross	07/14/1985	Dr. William A. Weber	3	2
Mt. Evans	08/29/1993	Betty Willard	3	2
Mt. Zirkel Wilderness Area	07/16/1977	Fort Collins Chapter	4	3
North Table Mt.	05/14/1994	Sally White, Loraine Yeatts	5	4
Pawnee National Grassland	06/02/1979	M. Shoop, J. Dodd, R. Engle, G. Turner	2	1
Pawnee National Grassland	05/29/1987	Rick Brune	4	3
Pawnee National Grassland	06/05/1993	Jim Borland, Rick Brune	6	4
Perly Canyon	05/20/1989	Rick Brune, Meg Van Ness	2	2
Phantom Canyon	06/10/1989	Alan Carpenter	4	3
Phantom Canyon Preserve	07/15/1995	Nature Conservancy	3	3
Pinon Canyon	05/25/1983	Tom Eamons	1	1
Plains Conservation Center	05/01/1980	A. Armstrong, S. Emrich, D. Buckner, M. Denham	3	2
Poudre Canyon	06/30/1990		4	3
Pueblo Lake	05/06/1995	Jim Locklear	3	2
Pueblo West	07/08/1988	Jim Borland	3	2
Purgatoire Canyon - Dinosaur Trackway	09/02/1995	Dexter Hess	3	2
Rampart Range	06/28/1987	Dave Powell, Neal Osbourne	3	2
Rampart Range	06/25/1988	Frank Hawksworth	3	2
Rattlesnake Canyon	05/28/1994	Dr. Walter A. Kelley	3	3
Roxborough State Park	05/30/1980	Susan Kraner, Vicky Trammel	3	2
Sewemup Mesa	05/29/1994	Dr. Walter A. Kelley	2	2
Taylor Arroyo	05/20/1989	Rick Brune, Meg Van Ness	2	2
Unaweep Canyon	08/10/1991	Scott Ellis	2	2
Western Slope	05/27/1979	Jim Ratzloff, Scott Ellis	4	3
Wray	06/04/1994	Bruce Bosley, Don Hazlett	6	5

HORTICULTURAL NOTES

Mahonia repens

Jim Borland
Horticultural Consultant

Although *Mahonia repens* (creeping Oregon grape) is found from British Columbia to Southern California and east to Arizona, Colorado, New Mexico and Texas, it is only known and widely used horticulturally in the Central Rocky Mountain States (zones 3 to 4).

Named after the late American horticulturist Bernard McMahon, species of the genus *Mahonia* all have one common feature: pinnately compound evergreen leaves with toothed edges. However, unlike other *Mahonia* which have bristle-toothed edges, *M. repens* has softer toothed edges. This feature makes it a truly versatile ground cover capable of withstanding the cold, dry weather that is a constant in the West's high altitudes.

Native to the sandy, chalky or granitic soils of Western coniferous forests, *M. repens* spreads through underground stolons to form a large, continuous ground cover. This 5 to 10-inch-tall plant grows well in both sunny and shady locations, needs no pruning, and exhibits no major pest problems. A healthy stand requires only slightly more than 15 inches of annual precipitation.

Dull, dark green, compound leaflets measuring 1.5 to 4 inches long cover the entire plant. When exposed to winter sun, these leaflets turn shades of red, maroon, yellow or purple. Winter burn, a malady common to many evergreens in this region, rarely affects this plant.

M. repens may bloom as early as March in favorable climates or as late as June in colder areas. Its dense, abundant, bright yellow inflorescences have a strong sweet fragrance and are followed by grapelike clusters of green berries. These edible berries turn blue-purple and usually remain until spring. Although quite tart, they can be used to make jellies and jams.

The native soils of *M. repens* are usually weakly acidic or basic. However, most well-drained soils, including those that are shallow, rocky, loamy, or low in salinity, are suitable. Strongly acidic nursery container soils and landscape soils with a pH as high as 7.6 produce excellent plants.

M. repens can be propagated by seed or root cuttings. The seeds are double dormant but can be broken using either of two methods. The first method requires stratifying the seeds at 45°F for 30 days, at 68°F for 60 days and then at 45°F for 196 days. The second method involves washing the seeds under running water for 24 hours followed by stratification at 34°F to 41°F.

Propagation by root cuttings is a tedious method that holds little advantage over seed propagation. Plants grown in flats can be dug and sold bare-root.

Chrysothamnus nauseosus

Jim Borland
Horticultural Consultant

The end of the growing season is seldom heralded by many blooming shrubs. Unusual in this respect, however, is *Chrysothamnus* (rabbitbrush), which festoons the western landscape from Canada to Mexico with golden-colored plumes of flowers.

Rabbitbrush grows native from the Great Plains to above timberline (up to about 10,000 feet), a vast area that includes hardiness zones 2,3 and 4.

Used sparingly in today's landscapes, *C. nauseosus*, along with several other rabbitbrush species, is becoming important in water-scarce environments. Nearly all rabbitbrush species exhibit the same growth pattern—multistemmed and upright but rounded. They differ mainly in height and winter stem color, which varies from green to blue to white.

C. nauseosus graveolens is a midsized race measuring 2 to 3 feet tall with gray-green stems and leaves. *C. nauseosus nauseosus*, on the other hand, is referred to in the trade as dwarf blue because of its shorter height and noticeable bluish stems and leaves. Both display 1 to 2-inch-long linear leaves arranged alternately on densely hairy stems, and both bloom in late summer or fall.

Rabbitbrush can tolerate drought. Deep taproots, branching extensively at depths of 6 ft. or more, help it thrive on less than 15 inches of annual precipitation. In addition, rabbitbrush accommodates almost all soil types, including sandy and gravelly soils and clay loams, as well as saline conditions. When planting rabbitbrush, consider only sunny, dry locations to avoid weak, drooping habits and root disease. Once established in an area without excess water, it seldom experiences problems more significant than an occasional aphid or stem gall infestation, neither of which is seriously debilitating.

Used singly or in masses, most rabbitbrushes can be sheared or cut almost to the ground each winter. However, neither practice is needed or recommended for a natural effect.

Since it has proved so difficult to propagate rabbitbrush from cuttings, most people propagate it from seed, which germinates best at 60 to 70°F with light. Approximately 50% of the tiny pappus-bound seeds germinate 2 to 4 days after sowing. Without special storage conditions, the seed remains commercially viable for only one year.

When nursery grown in almost any soil, rabbitbrush produces 1-gal. plants after one season, and 5-gal. plants after two seasons.

CHAPTER NEWS

Boulder Chapter

Boulder Chapter programs meet from 7:30 to 9:00 p.m. on the 2nd Thursday of each month (note change from previous years!) at the Foothills Nature Center, 4201 N. Broadway, Boulder. Call Lynn Riedel (666-6687) or Elaine Hill (494-7873) for details and check the *Daily Camera*.

Mar. 7

Dr. William A. Weber—Floras

Dr. Weber will discuss quality control in the construction of floras, including the pros and cons of different types of keys and the use of common names.

Apr. 11

Mark Gershman—Wetlands of City of Boulder Open Space.

Mark Gershman will discuss wetland inventory, mapping, and management in the Boulder Valley.

May 9

Spring Hike—Wildflowers and Reclamation on the Mount Sanitas Trail

Meet at the Mt. Sanitas Trailhead west of Mapleton Hospital at the mouth of Sunshine Canyon at 6:00 p.m. Bring a picnic dinner.

THE BOULDER CHAPTER NEEDS

HELP! Please consider taking part in Boulder Chapter community service planning. Involvement by more members will promote Society conservation efforts and will revitalize chapter activity. Suggestions are: 1) ideas and planning for community service/demonstration projects (e.g., native plant landscaping, restoration, weed control), 2) ideas and planning for chapter-sponsored workshops and field trips (e.g., grasses identification workshop, native plant nursery tour), 3) coordination of document review and letter writing campaigns for native plant conservation issues, and 4) participation in chapter program planning and production (e.g., publicity, refreshments). Members interested in becoming more involved (including chapter leadership/co-leadership) can contact Lynn or Elaine.

Southwest Chapter

Call Sandy Friedley (970) 884-9425 for details and directions to field trips.

March 20—Vicki Rae and David Temple Landscaping in the Four Corners

7:00 p.m. in Rm. 125 of Noble Hall, Ft. Lewis College, Durango.

April 24—Dr. Page Lindsey

Mushrooms in the Southwest

7:00 p.m. in Rm. 125 of Noble Hall, Ft. Lewis College, Durango.

May 11—Sandy Friedley

Field trip to see *Pediocactus knowltonii*, *Astragalus proximus*, and other early flowers in the pinon-juniper vegetation type.

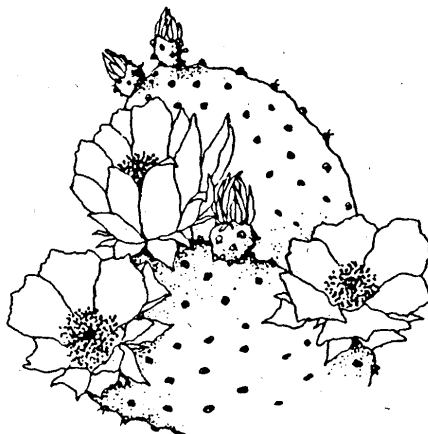
June 8—Goodman Point

July 13—Dick Mosely and Charlie King White Fir Research Natural Area

August 10—Dr. Dave Jameison and Al Spence

Field trip to Subalpine flowers in the Sharkstooth area of the La Plata Mountains.

September 14

Mushrooms in the Durango area

Prickly Pear - Opuntia sp.

Artist: Barbara Bash

Metro-Denver Chapter

Monthly meetings are held at the Denver Botanic Gardens. Room assignments vary, so please check the location for each individual meeting. The dates of regularly scheduled meetings have been changed to the fourth Tuesday of each month to avoid conflicts with the Bonfils-Stanton lecture series at the Denver Botanic

Tuesday, March 26, 1996

Morrison Center**Carl Mount—Recent Developments in Mine Reclamation in Colorado**

Carl Mount will discuss recent regulatory changes to State laws covering non-coal mine reclamation. He will also describe the workings of the Division of Minerals and Geology (DMB), and what is looked for in a typical inspection. Carl Mount is a Senior Reclamation Specialist with the DMB Minerals Program which currently administers about 2000 reclamation permits in Colorado. Carl has worked in or studied mined land reclamation for the past 17 years.

Tuesday, April 23, 1996

Classroom B**Dina Clark—Flora of the Mesa de Maya**

The Mesa de Maya region of southeast Colorado is of great interest botanically because it has species found nowhere else in the state, and is remote and largely undisturbed. Dina Clark studied the flora of this area for her masters degree at CU-Boulder, and will present the results of her study.

Saturday, May 18, 1996

Morrison Museum**Hike and Botanizing in Red Rocks Park/Pot Luck at Morrison Natural History Museum**

We will meet at 2:00 PM for a hike in Red Rocks and nearby parks, including the Morrison slide, an excellent area for spring flowers. At around 5:00, we will return to the Museum for a pot luck dinner at 5:30 or 6:00. The Museum has a complete kitchen, for rewarming or completing pot luck dishes.

CALENDAR OVERVIEW

Mar 9 CONPS Board of Directors Mtg (see p. 3)

April 10 **DEADLINE FOR AQUILEGIA Vol. 20 #2**

April 15 & 24 50 Years with Boulder County Plants
Dr. William A. Weber (see p. 2)

1996 WORKSHOPS

Mar 16 The Bellflower Family—Campanulaceae
(1st Session)

Mar 17 The Bellflower Family—Campanulaceae
(2nd Session)

April 5 Saxifrages (lecture)

April 6 Saxifrages (workshop)

1996 FIELDTRIPS

May 11/12 Plants and Petroglyphs in Northwestern
Colorado

June 1 Green Mountain Moony—Botany for
Lunies

June 15 Orchids of Rocky Mountain National Park

July 27/28 Neota Wilderness

Aug 3 Guanella Pass

Aug 3 Snow Mesa

Aug 11/12 Uncompahgre/American Basin

Aug 17/18 San Luis Valley

CHAPTER MEETINGS

Metro-Denver

Mar 26 Recent Developments in Mine Reclamation
in Colorado

April 23 Flora of Mesa de Maya

May 18 Potluck and hike in Red Rocks Park

Boulder

Mar 7 Floras

April 11 Wetlands of City of Boulder Open Space

May 9 Potluck and spring hike at Mount Sanitas

Southwest

March 20 Landscaping in the Four Corners

April 24 Mushrooms in the Southwest

May 11 Early Flowers in the P-J Vegetation Type

June 8 Goodman Point

July 13 White Fir Research Natural Area

Aug 10 Sharkstooth area of the La Plata Mountains

Sept 14 Mushrooms in the Durango area



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