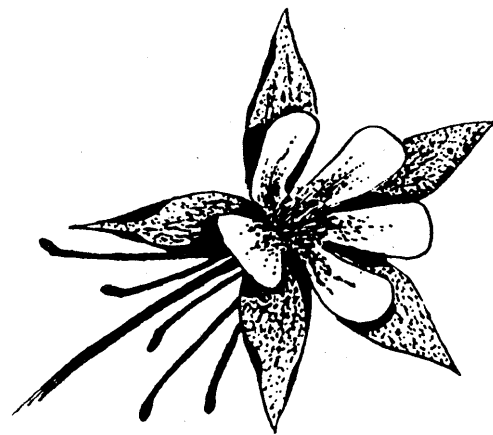


# Aquilegia



Newsletter of the Colorado Native Plant Society

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

Volume 20 Number 3

July — September 1996

## Flora of the Mesa de Maya Region

**Dina Clark**  
University of Colorado

Forty-five miles east of Trinidad, Colorado, a massive plateau called Mesa de Maya rises unexpectedly from the southern High Plains in southeastern Colorado and northeastern New Mexico. Capped by Pliocene-age volcanic basalt, Mesa de Maya straddles the Colorado/New Mexico border and extends approximately 45 miles eastward into the Oklahoma Panhandle, where the same physiographic feature is known locally as Black Mesa. Surrounding the Mesa de Maya are smaller basalt-capped mesas separated by deep canyons. Arroyos and shallow ravines further dissect the landscape. Nearly four-fifths of the Mesa de Maya volcanic complex lie within Las Animas County in southeastern Colorado.

Mesa de Maya was formed by a combination of geologic processes. Like much of Colorado's eastern plains, the bedrock underlying the region is composed of different sedimentary layers that were laid down during the Paleozoic through Mesozoic Eras (Duce, 1924). Unlike other parts of eastern Colorado, however, this area underwent a period of volcanic activity during the Pliocene Epoch (Duce, 1924). Several volcanoes erupted, spreading lava in uneven patterns across the landscape (Rogers, 1953). Erosional forces acting over the ensuing millions of

years have carved away at exposed sedimentary areas more quickly than areas covered by basalt, leaving behind a dissected landscape of basalt-capped mesas, canyons, and arroyos surrounded by the rolling terrain of the southern Great Plains.

The flora of the Mesa de Maya region is diverse and complex. It consists of numerous vegetation types, including ponderosa pine savanna, piñon-juniper woodland, deciduous riparian forest, and xeric tall-grass, mid-grass, and short-grass prairie. These vegetation types are composed of plants with different phytogeographic affinities, including Great Plains, West, and Southwest. Although the area was botanized in the late 1940s by C. M. Rogers, its size, isolation, and ruggedness have left it largely unexplored.

During 1993 and 1994, I conducted a floristic study of the Colorado portion of

the Mesa de Maya region. My study area included Mesa de Maya and the smaller mesas and canyons surrounding it. I inventoried approximately 90,000 acres (36,437 hectares) on the Louden, Kirkpatrick, Feemster, and Spool private ranches. Each ranch is located in a different section of the region, thus providing the opportunity to examine a range of plant communities on differing slopes, aspects and elevations. The Louden ranch is located in the highest part of the region, the northwest corner, where elevations reach 6800 feet (2100 meters). The Spool ranch is in the southern part of the region; it is drier and lower in elevation and includes many canyons and south-facing exposures. The Feemster and Kirkpatrick ranches are located in the eastern portion of the region, and include Tecolote Mesa, tributaries of Carrizo Creek, and surrounding plains.

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**NEWSLETTER COMMITTEE NEEDS NEW MEMBERS**

Changes in habitat and responsibilities for Tamara and Nina have made newsletter production much more difficult over the past year. Tamara's move to Dinosaur and Nina's recent move to Mancos (not to mention her new little boy) are proving to be more than challenging for timely and efficient production of *Aquilegia*. The newsletter is an important service to CONPS members and needs the attention of someone who has adequate time, access to printers, and the ability to mail the newsletter at the Denver Terminal Annex, where our bulk mail permit is valid.

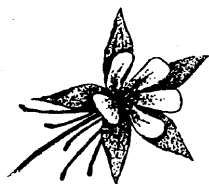
If you are interested in taking this on, please call Tamara Naumann (970) 374-2504. It's been fun, but it's time to pass the torch. Here's your chance to test drive that new desktop publishing software you've installed on your home computer!



**Editor's note:**

The artist who rendered the illustration of *Cercocarpus ledifolius* that appeared on page 4 of *Aquilegia* Vol. 20 No. 2 was Elnor L. Keplinger.

**Colorado Native Plant Society**



The Colorado Native Plant Society is a non-profit organization dedicated to the appreciation and conservation of the Colorado's 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:

**Tamara Naumann**  
**24 Park Lane**  
**Dinosaur, CO 81610**  
**E-Mail:**  
**Tamara\_Naumann@nps.gov**

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-compatible, please) are appreciated. Please indicate word processing software and version.



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# ANNOUNCEMENTS

## Colorado Weed Management Association

Annual Conference & Trade Show

December 3 - 4, 1996

Holiday Inn  
Denver International Airport

Registration is \$125 for CWMA members, \$140 for non-members. To register or for more information, contact CWMA, 2305 Nottingham Ct., Fort Collins, CO 80526, (970) 229-0352.

### Topics:

- Colorado's noxious weed act
- Perennial pepperweed management
- Public relations & weed management
- Hazardous materials regulations
- Biology & control of poisonous plants
- Wildlife & noxious weeds
- Safety equipment
- Aquatic weed management
- Dyer's woad management
- Roadside weed management
- Society for Range Management & noxious weeds
- Integrated weed management
- Biological control of invasive weeds

## U. S. Fish and Wildlife Service Loses Director Mollie Beattie

Mollie Beattie, the first woman to serve as Director of the U. S. Fish and Wildlife Service, died of cancer on June 27. She led the agency during a period of intense controversy (she took office in September 1993). Beattie was a vigorous defender of the Endangered Species Act and worked tirelessly to protect the Arctic National Wildlife Refuge from oil exploration. Supporters and opponents alike recognized the integrity, dedication, and professionalism she brought to her work.

Mollie Beattie oversaw the reintroduction of grey wolves to Yellowstone National Park—restoring a missing link in the food chain that begins with native plants. She knew the importance of helping people understand the linkages between the future of humanity and the future of wildlife:

## Jack Ward Thomas Retires From His Post As Chief of the Forest Service

Many positive changes have taken place in the Forest Service under Chief Thomas's leadership. Our native flora has surely benefitted. The following is excerpted from a statement issued October 10, 1996:

When I became Chief, I established some personal and professional goals for myself. These goals have been met. In the last three years, we have taken ecosystem management forward nationwide, integrated science into management decisions, brought about a cultural change, diversified the Agency's leadership, and set the Course To The Future for the Forest Service.

Since these goals have been met, the time has come for me to retire. I will be leaving the Forest Service in mid-November. During my remaining tenure, I will be working with Secretary Glickman and Under Secretary Lyons in the selection of my successor. Meanwhile, the Forest Service remains committed to meeting our public obligations and protecting natural resources for future generations.

I will be moving to Missoula, Montana where I have taken the position of Boone and Crockett Chair at the University of Montana. This teaching position will enable me to continue my personal commitment to conservation.

I look forward to returning to the West. That's where my heart is. The opportunity to work with natural resource professionals in an academic setting, and be part of one of the more progressive natural research organizations in the World is exciting. Now that I have fulfilled by personal and professional goals with the Forest Service, I look forward to this new challenge.



"This is the legacy I would like to leave behind, I would like to have stopped the ridicule about the conservation of snails, lichens, and fungi, and instead move the debate to which ecosystems are most recoverable and how we can save them, making room for them and ourselves."

She believed that a healthy economy depends, ultimately, on a healthy environment:

"The truth is that our economy depends on the sustained health of our environment. What is economic in the long run is what conserves endangered species. No accurate cost-benefit analysis would calculate in favor of extinction."

We have lost an important voice in defense of wild flora and fauna. President Clinton signed the Mollie Beattie Wilderness Act on July 29, recognizing her accomplishments with an eight-million-acre Arctic wilderness in the Alaskan Brooks Range.



Continued from page 1—

I made fourteen collecting trips from April to October during the summers of 1993 and 1994, spending a total of 520 hours in the field. I tried to visit the area after it had received precipitation because the flora responds strongly to seasonal moisture. After the field component of the study was completed, I identified species using published floras, microscopes, and museum specimens housed in the University of Colorado Herbarium (COLO). Plant specimens were deposited at COLO; duplicates were sent to the University of New Mexico (UNM) at Albuquerque, and to the Rocky Mountain Herbarium (RM) at the University of Wyoming at Laramie. I compiled a comprehensive species list for the area from several sources: my own collections, specimens in the University of Colorado Herbarium, and specimens documented by Rogers (1953) that are housed in other herbaria.

Five hundred and seventy species of vascular plants representing 93 families and 334 genera were documented. Four hundred and forty-two species were collected in the field; the remaining species are documented in collections housed at COLO and/or in published literature.

The sunflower family (Asteraceae) had the greatest representation, 99 species in 58 genera, followed by grasses (Poaceae) with 80 species in 46 genera. Within the Poaceae, the genus *Muhlenbergia* was dominant with nine species. The pea family (Fabaceae) is also very diverse—53 species in 20 genera. The genera *Astragalus* and *Dalea* were represented by 14 and nine species, respectively. The milkweed family (Asclepiadaceae) was also notable for its unusually high diversity—12 species in two genera.

Of the total number of species collected, six were new additions to the flora of Colorado. These include two grass species, *Bothriochloa springfieldii* and *Diplachne dubia*; two composites, *Helènum microcephalum* and *Heterosperma pinnatum*; and one fern, *Astrolepis integerrima*. During the 1993 season, Rick Brune collected a species new to North America—*Aethionema saxatile*, a mustard common to the Mediterranean.

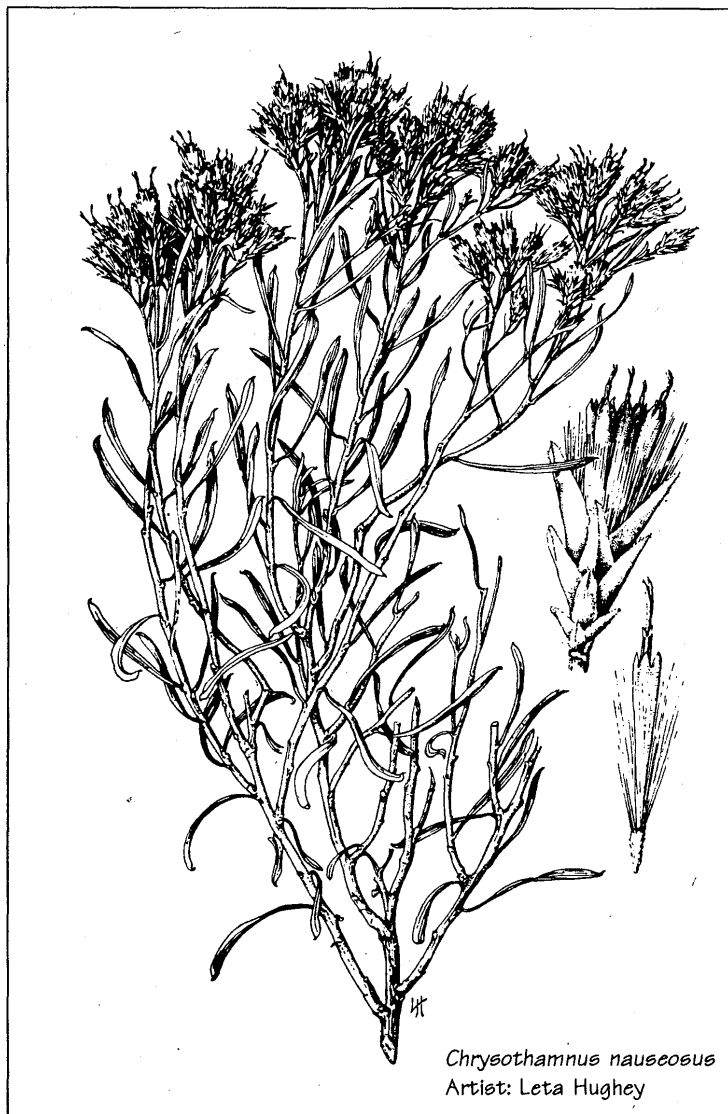
two milkweeds (*Asclepias oenotheroides* and *A. macrotis*) and a chenopod (*Chenopodium cycloides*) for the second time since 1949.

Several of the species new to the Colorado flora, many of the rarer species, and a surprisingly large component of the Mesa de Maya flora are plants common to west Texas, eastern New Mexico, and Chihuahua, Mexico. These Chihuahuan elements of

Colorado's flora extend into Colorado via the Arkansas River drainage (Weber, 1965). Weber explains their presence in the southeastern portion of the state by suggesting that they have not encountered substantial climatic boundaries prohibiting their northward migration.

Many of the Chihuahuan plants of Mesa de Maya are considered peripheral species in Colorado, meaning that they are at the northern limit of their geographic range. Mesa de Maya is the only area in Colorado where some of these species occur. Most often these are found on slopes with south-facing aspects. *Prosopis glandulosa* (honey mesquite), *Nolina texana* (beargrass), and *Dalea formosa* (feather plume) are examples of Chihuahuan peripherals found only in the Mesa de Maya region within Colorado. Mesquite, represented by only a few individuals, is found on open south-facing mesa slopes. Beargrass is found on a few south-facing slopes just below slabs of basalt that have tumbled from the cap rock. Feather plume is found on

gravelly benches and sandstone shelves at the base of south-facing mesa slopes. Other interesting Chihuahuan species include four ferns: *Cheilanthes feei*, *C. eatonii*, *C. wootonii*, and *Notholaena standleyi*. These ferns grow in crevices of sandstone on south-facing mesa slopes.



*Chrysothamnus nauseosus*  
Artist: Leta Hughey

I documented range extensions for *Jamesia americana*, *Pterospora andromedea*, *Dalea multiflora*, *Schoenocrambe linearifolia*, and *Allionia incarnata*. I also collected several species for only the second time (based on COLO records). For example, I collected *Allionia incarnata*, a member of the four-o'clock family (Nyctaginaceae), which had previously been collected at Cañon City in 1901. Similarly, I collected

—Continued on page 5

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The species mentioned here are just a few of the wonderful plants that comprise the complex flora of this incredibly scenic region. This study illustrates Mesa de Maya's significant contribution to the floristic diversity of Colorado's eastern plains. The plains are often overlooked, and passed over (quickly!) by both botanist and traveler for cooler, greener mountainsides. They are, however, special places, and are worthy not only of study but also of our conservation efforts.

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Duce, J. 1924. Geology of Parts of Las Animas, Otero, and Bent Counties. Colorado Geological Survey Bulletin 27. pt. III.

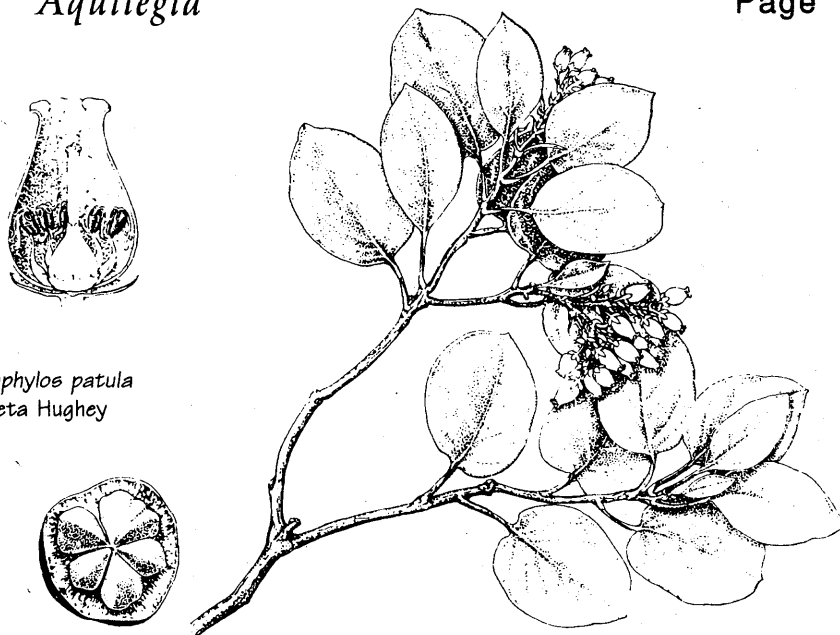
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Weber, W. A. 1965. Plant geography in the Southern Rocky Mountains. pp. 453-468 *In* The Quaternary of the United States (H.E. Wright and D.G. Frey, Eds.), Princeton University Press, Princeton, NJ.

*Editor's note: Dina Clark's Mesa de Maya work was supported, in part, by funds provided by the Colorado Native Plant Society's John Marr Fund.*

*Also, see page 9 for information on Dina's Mesa de Maya Workshop, coming to Boulder in February.*

*Arctostaphylos patula*  
Artist: Leta Hughey



**Colorado Flora Miscellany—*Corispermum***

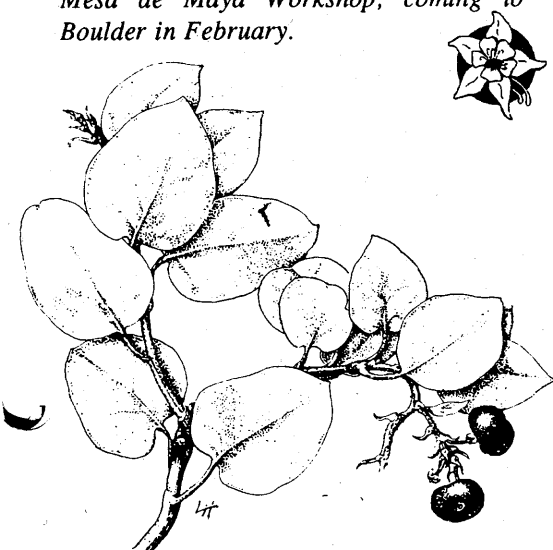
**William A. Weber**  
**Curator Emeritus**  
**University of Colorado Herbarium**

*Corispermum* is a genus of Chenopodiaceae limited to sandy places, especially dunes. We have generally assumed that our few species are all introduced aliens, but new studies by Sergei L. Mosyakin claim that most of them are native, and that the introduced species are relatively infrequent. In Colorado, he recognizes three species of native *Corispermum*. *C. americanum* (Nuttall) Nuttall, the most common one, is a slender, glabrous plant with ascending branches and long spikes of flowers. The "seed" (actually a one-seeded ovary looking like a bedbug) is about 2 mm long and definitely winged on each side. *C. villosum* Rydberg is a stout plant with divaricate, slightly villous branches and short flower spikes. The seeds are similar but either wingless or very slightly winged. The third, *C. navicula* Mosyakin, described in 1995, is very distinct, having stout, spreading branches and short spikes with very large, ovate bracts that are much longer than the seed, and the seeds are about 4 mm long and broadly winged.

*C. navicula* (the name meaning incense boat) is so far found only at the type locality, the North Sand Dunes of North Park, just east of Cowdrey. My cousin F. Martin Brown collected the type on

September 29, 1976 while on a butterfly excursion. Ernie Nelson of the Rocky Mountain Herbarium and I went there on October 1, 1996, to see if we could find it and at least collect seed. Parts of the North Sand Dunes are open to dune buggies, but this has not affected the "bugseed" plants, which grow at the outer edges of the dunes, on sand flats and low dunes being invaded by aspen. This must have been a dry year, because on the open sand, the *Corispermum* was only a few centimeters high, but in full fruit. The seeds "exploded" off the plant when the branches were touched. A few larger plants (about 1 dm tall) occurred under the aspens where the water table was closer to the surface. It was, however, just as late in the season as one could possibly find them.

The North Sand Dunes are very interesting because they support, on the sand flats between the barren active dunes, an assemblage of species that don't typically occur together. Here is a partial list: *Festuca saximontana*, *Oreocarya (Cryptantha) virgata*, *Eriogonum umbellatum*, *Chaenactis douglasii*, *Achnatherum (Oryzopsis) hymenoides*, *Heterotheca villosa*, *Conyza canadensis*, *Artemisia frigida*, *Oligosporus pacificus*, and *Senecio spartioides*. It's a very interesting place—an excellent choice for a CONPS field trip in August, 1997.



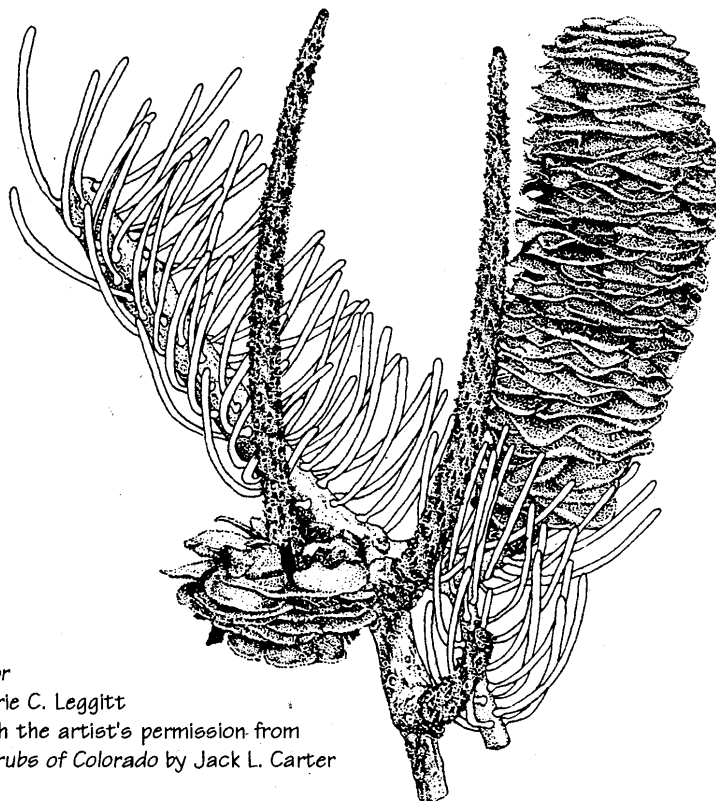
# Botanical Opportunities Lost and Found

**Richard G. Beldleman**  
**Professor Emeritus (Biology)**  
**Colorado College**

At the October 20th meeting of the Academy of Natural Sciences of Philadelphia in 1874, Thomas Meehan reported that St. Louis botanist George Engelmann had discovered the white fir, *Abies concolor*, at Glen Eyrie, northwest of the new community of Colorado Springs. Engelmann had been carrying out field work in Colorado during the summer of 1874, with a special eye toward conifers. At the time little was known about the distribution in the Southern Rockies of this southwestern (and West Coast) fir, originally collected by Augustus Fendler in the mountains east of Santa Fe during the winter of 1846-47. In fact, in George Gordon's 1858 definitive treatise on conifers, *Pinetum*, he wrote that the "Concolor-Silver Fir" was "a tall tree, found on the mountains of New Mexico by Engelmann, of which nothing further is known." Engelmann's 1874 report was undoubtedly the first for Colorado Territory that recognized the correct species.

Thomas Meehan, incidentally, was an important nurseryman near Philadelphia during the last century, who especially promoted the promulgation of native trees, was editor of *The Gardener's Monthly* (a horticultural journal), and in one issue had written a definitive biography of the famous western plant collector Thomas Nuttall.

Even though Engelmann was his "distinguished friend," Meehan was likely a wee bit piqued about the Glen Eyrie report, for reasons of professional jealousy. Meehan himself had been botanizing in the Pikes Peak region in 1871. While exploring "what was till then an unknown canon," (which he promptly named Engelmann Canyon, up which the Pikes Peak cog train now runs from Manitou Springs), Meehan had encountered a "considerable quantity" of the same fir. He even climbed up one tree to get a closer look at the cones. Unfortunately, however, he finally concluded that these firs were



*Abies concolor*

Artist: Marjorie C. Leggitt

Reprinted with the artist's permission from  
*Trees and Shrubs of Colorado* by Jack L. Carter

simply variations of the Northwest's *Abies grandis*. The next summer when Thomas Porter of the Hayden Survey discovered similar firs up nearby North Cheyenne Canyon (in what is now a White Fir Preserve), he too came to the same erroneous taxonomic conclusion. Of course, one should remember that Engelmann was no novice when it came to *Abies concolor*. Based on the preserved specimens from Fendler (despite what Gordon wrote, Engelmann did not collect the first specimens), he had already named it *concolor* in 1850; but truth to tell, he put it in a recognized subsection of the genus *Pinus* (thus, *Pinus concolor*), in the same issue of *Journal of the London Horticultural Society* in which Britisher John Lindley named the tree as a new species, *Abies concolor*.

So it was that George Engelmann could make his 1874 claim of Colorado *Abies concolor* discovery, as the result of misidentification by at least two earlier botanists. Neither Meehan nor Porter, however, should have felt too badly. In 1820 when Edwin James, botanist with the

Major Long exploring expedition, made the first ascent of Pikes Peak, he is assumed, now, to have started up that selfsame Engelmann Canyon; and among the five single-needle conifer species he noted during the hike but couldn't correctly distinguish was inevitably the white fir.

Although I only recently realized that Thomas Meehan had visited the Colorado Springs area as early as 1871, I had experienced earlier—and intriguing—indirect encounters with this botanist during some of my research escapades. One spring when working at the Academy of Natural Sciences, in particular on Thomas Nuttall, we were taking a Sunday drive in the countryside and passed an old establishment with a sign that said "Meehan's Nursery." My wife inquired, "You don't suppose that is actually the original Meehan's Nursery?" To which I replied, driving on, "Seems unlikely." But my wife finally coerced me to drive back; and I reluctantly trudged up to a chap reclining in a front-yard chair and queried,

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"You're not by any chance related to Thomas Meehan, the famous nurseryman from last century?" His reply immediately catalyzed my enthusiasm, since he proved to be a direct descendant, and it was indeed the famous nursery.

"You don't by any chance," I eagerly hastened, "have any books that belonged to your ancestor?"

"Yeah," came the rejoinder, "the old barn is filled with them." And sure enough, that rustic old 18th century barn proved to be filled with wooden boxes of books, some of them covered but as many more open to dust, roof leaks, and pigeon and rat scat. What a botanical treasure trove! Old herbals in Latin, Linnaeus' *Genera Plantarum*, Torrey and Gray, Hooker, Pursh, Amos Eaton...dozens of botanical publications I'd only seen in rare-book collections.

Rushing out to the young man in his reclining chair, I shouted in excitement, "You have a wealth of scientific books in the barn! There wouldn't be any more books inside your house, by any chance?" I

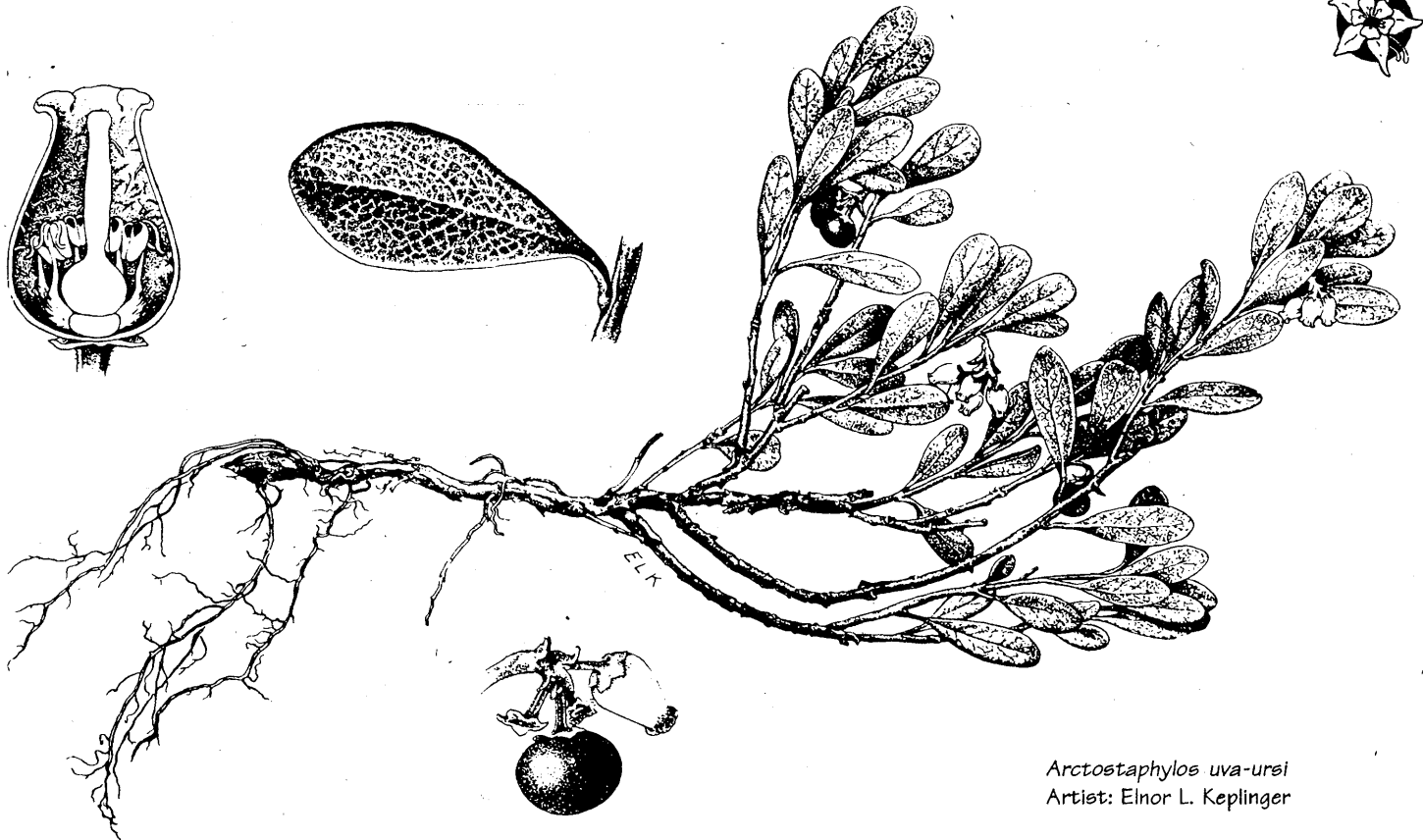
was obviously thinking that if these kinds of books were in the barn, what really valuable ones must be sequestered in the protection of the house? His reply was unbelievable: "Oh, there's a big safe in there that's filled with books." Yes, there was a big safe. And indeed it was filled with books, to wit the many bound back volumes of Thomas Meehan's *Gardener's Monthly*. Ah, well.

As I departed, I said to descendant Meehan, "Would you mind if I came back tomorrow to inventory and carefully repack the books in the barn?"

Thus it was that the following day I diligently labored in that dirty barn, cleaning books, sorting, entering volume titles into my portable Olivetti typewriter, reboxing.... When I finally completed the task, I reported to my host what I had accomplished, promised him a copy of the inventory, and made the naive academic suggestion that such an historic collection would be a valuable contribution to the library of the American Philosophical Society. There was a pause, and then Mr. Meehan drawled, "Well, after what you have told me, I think I'll get out some of the books this coming winter and read them."

Was I disappointed? I could only presume that he was referring in particular to those written in Latin. Incidentally, I never did learn the disposition of the collection, but in retrospect I suspect it might have been carted in to a rare-books dealer in Philadelphia within a fortnight!

My other Meehan encounter? I was browsing in a used bookstore in downtown St. Louis, one of those old-time bookstores where the crowded shelving extends almost out of sight towards the ceiling. My particular interest was early natural history treatises and last-century exploring expedition reports, but so far I'd found nothing. Climbing up a very tall ladder to get a better perusal, I noticed on the very top shelf a volume in tattered black binding, with no marking of any kind on the spine. What possessed me to risk life and limb by stretching up to pry out that book, I'll never know. But as I flipped it open, balancing atop the ladder, there was a portrait of frontier botanist Thomas Nuttall as a frontispiece. It was the very volume of Thomas Meehan's *Gardener's Monthly* which contained that biographical sketch of Nuttall! In a bookshop, incidentally, that was just a short stroll from George Engelmann's old home.



*Arctostaphylos uva-ursi*  
Artist: Elnor L. Keplinger

# FALL & WINTER WORKSHOPS — 1996-1997

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 our enjoyment and understanding of Colorado's native flora.

To register for workshops, 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; write Bill Jennings, P.O. Box 952, Louisville, CO 80027. Whichever way you register, 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 supplies, 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 for the 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

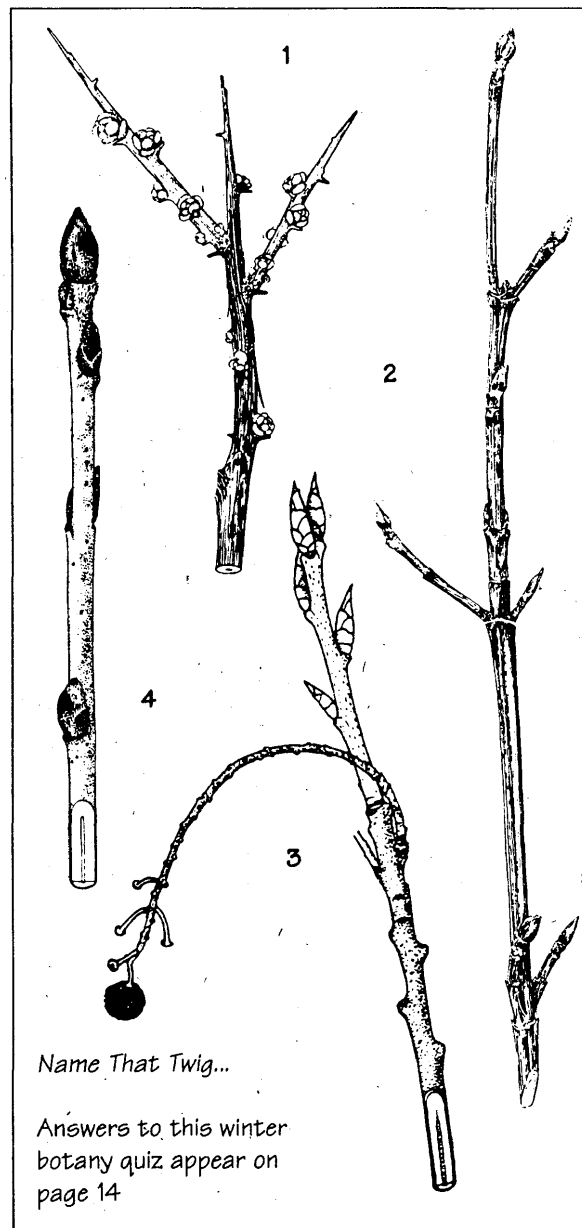
classrooms and labs where these workshops are held, and we are holding a seat for you. If you find that you CANNOT attend a workshop for which you are registered, please call and cancel your registration as soon as possible!

Long-time members of CoNPS may recall that Bill has done much the work of organizing, taking registrations, sending notices, taking payments, providing refreshments, as well as teaching occasional workshops. We encourage CoNPS members to join the workshop committee and help ensure the continuation of the program. Any help is always appreciated.

Volunteers are needed to lead workshops, particularly for plant families with few representatives in Colorado. If you have a favorite plant family or genus, or there is a family or genus about which you wish to know more, then consider leading a workshop on the topic. Refer to the books of Dr. William A. Weber (*Colorado Flora: Eastern Slope*; *Colorado Flora: Western Slope*; or *Rocky Mountain Flora*) to determine the number of species in a given family or genus. Full-day workshops dedicated to a single family or genus usually cover 15 to 30 species; a half-day workshop is practical for 7 to 15 species. Call Bill Jennings and he will tell you what is involved in preparing a workshop. If you volunteer NOW, you will have all winter to work in the herbarium, all next summer to look at plants in the field, and the fall of 1997 to organize your program before presentation in the winter of 1997-1998. Remember, on the day of the workshop, no one will know more about the topic than you!

It takes considerable time and effort for the instructors to plan and develop workshops or field trips.

Please let us know how you like the activities offered by CoNPS. We need your suggestions for future workshops and field trips. We appreciate feedback on whether you find them informative and exciting or dull and uninteresting.





# FALL & WINTER WORKSHOPS — 1996-1997

## THE ASTERACEAE: GENUS *HAPLOPAPPUS* AND ITS RELATIVES

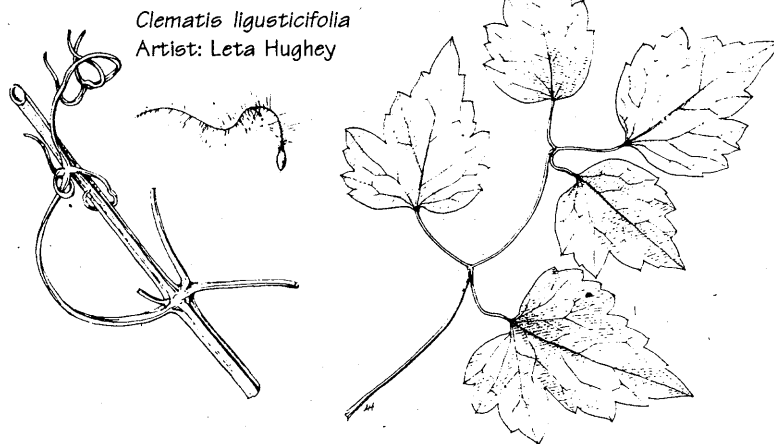
Leader: Dr. Gregory K. Brown

Location: University of Colorado - Boulder

First session: Saturday, November 2, 1996

Second session: Sunday, November 3, 1996

Our first out-of-state workshop leader is Dr. Gregory K. Brown of the University of Wyoming. He has been working in the *Haplopappus* group of genera for many years, in collaboration with Drs. Ronald Hartman, Meredith Lane, and John Semple. Among other things, Dr. Brown's research has uncovered an undescribed species of *Oönosis* in the Arkansas Valley. He and his co-workers propose division of *Haplopappus* and recognition of numerous segregate genera, such as *Stenotus*, *Tonestus*, *Oönosis*, *Isocoma*, *Pyrrocoma*, and others. Dr. William A. Weber already recognizes many such genera. However, for a differing opinion, read Arthur Cronquist's introduction to genus *Haplopappus* on page 197 of *Intermountain Flora*, volume 5. This is a rare chance to learn about plant research on a complex group of species.



## THE ASTERACEAE: GENUS *PACKERA* IN COLORADO

Leader: Renéé Rondeau

Location: Foothills Nature Center, Boulder

First session: Saturday, December 7, 1996

Second session: Sunday, December 8, 1996

Renéé Rondeau, botanist with the Colorado Natural Heritage Program, will present a workshop on Genus *Packera*, continuing our focus on the Sunflower family. Previously included in *Senecio*, genus *Packera* was proposed in 1976 by Löve and Löve and is generally accepted as a valid genus by most taxonomists working in the Asteraceae. Renéé will have slides and specimens of most of the Colorado representatives of this interesting genus. Handouts will highlight the key characters and habitat for each and we will learn the characters that distinguish *Packera* from *Senecio*.

## WINTER TWIG IDENTIFICATION

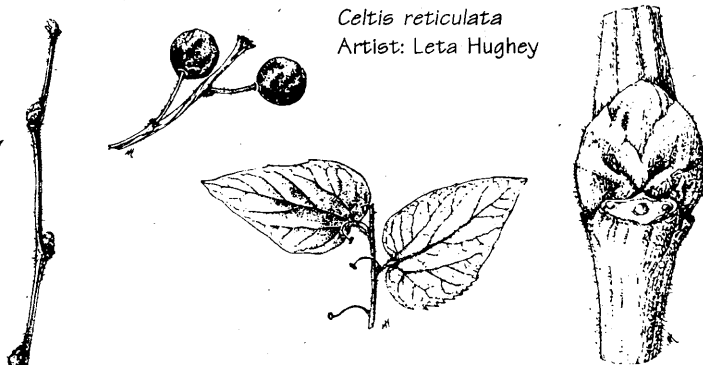
Leader: Janet J. Coles

Location: Foothills Nature Center, Boulder

First session: Saturday, January 11, 1997

Second session: Sunday, January 12, 1997

We schedule workshops during the winter because you can't do field botany then, right? Actually, there's still a lot to see and do in the field from November to March in Colorado, provided you know what to look for. Woody plants, in particular, are the most obvious element of the winter landscape, but except for the conifers, are not in leaf or in bloom. This presents interesting challenges to plant identification. Janet will show how to identify plants in winter, by using bark color and texture, bud characteristics, branching patterns, persistent fruit, and habitat. Some plants that are not woody, but persistent and identifiable in death, will also be covered. If weather permits, we will go to the field after lunch and put our newly learned skills to good use.



## THE CHIHUAHUAN ELEMENT IN THE COLORADO FLORA

Leader: Dina Clark

Location: Ramaley Building

University of Colorado at Boulder

First session: Saturday, February 1, 1997

Second session: Sunday, February 2, 1997

Dina Clark recently completed her master's degree at CU—Boulder, with thesis research on the Mesa de Maya, Las Animas and Baca Counties, in southeastern Colorado. This part of Colorado is most unusual, as there are many plants present that are part of the mountain and desert floras of northern Mexico, reaching their northern limits here. There is a significant number of Rocky Mountain and Great Plains species present, to be sure, but the Chihuahuan elements are the focus of this workshop. Learn why this part of Colorado has this element as a significant portion of its flora and learn how to identify these plants that occur nowhere else in Colorado. East of Interstate 25, Colorado is not just a flat, featureless grassland! Southeastern Colorado has a very interesting and unique flora. This area really grows on you once you get to know it.

# FALL & WINTER WORKSHOPS — 1996-1997

## MOONWORTS

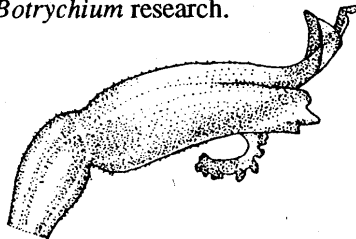
Leader: Peter Root

Location: Kathryn Kalmbach Herbarium  
Denver Botanic Gardens

First session: Saturday, February 22, 1997

Second session: Sunday, February 23, 1997

The ferns in the Ophioglossaceae are small and many are rare. Most are on the list of Colorado Plant Species of Special Concern. As a result, moonworts (*Botrychium*) are seldom encountered by the botanical public. They are exceedingly difficult to see in the field, and one encounters them after much diligent searching or by stumbling upon them by accident. Nevertheless, Peter Root has developed an eye for *Botrychium* habitat, and has spent many years searching and viewing these elusive plants. He will present the species that are currently known for Colorado, and bring us up to date on *Botrychium* research.



## THE ORCHIDS OF COLORADO

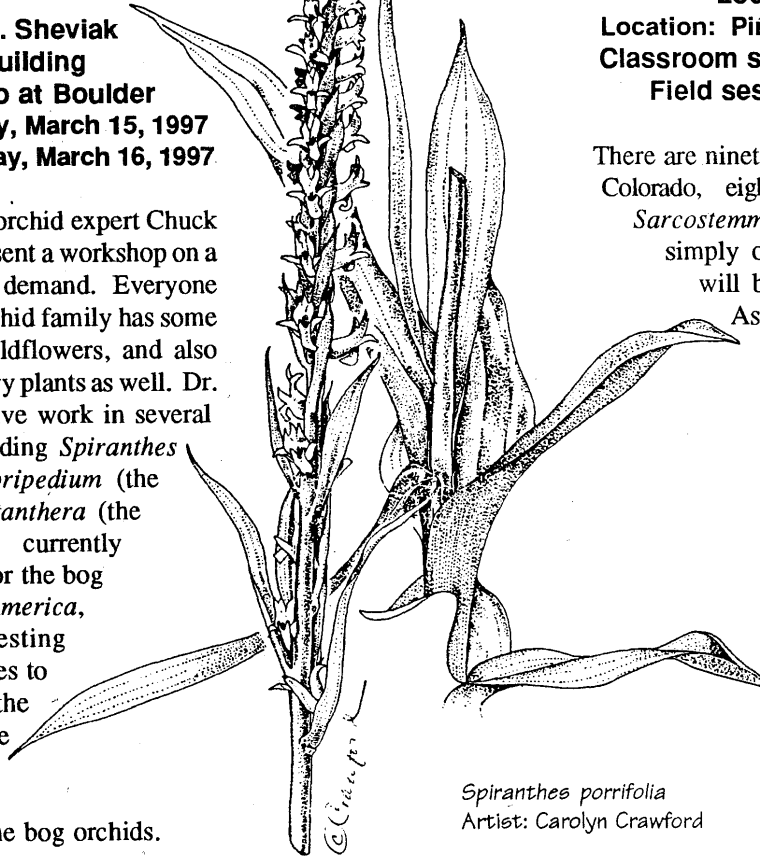
Leader: Dr. Charles J. Sheviak

Location: Ramaley Building  
University of Colorado at Boulder

First session: Saturday, March 15, 1997

Second session: Sunday, March 16, 1997

We are very pleased that orchid expert Chuck Sheviak has agreed to present a workshop on a topic that is constantly in demand. Everyone loves the orchids. The orchid family has some of our most beautiful wildflowers, and also has some of our least showy plants as well. Dr. Sheviak has done extensive work in several problematic groups, including *Spiranthes* (the ladies'-tresses), *Cypripedium* (the lady's-slippers), and *Platanthera* (the bog orchids). He is currently preparing the treatment for the bog orchids for *Flora North America*, and has some interesting observations that he wishes to share. Although all the Colorado species will be discussed, focus of the workshop will be on the recent developments in the bog orchids.



*Spiranthes porrifolia*  
Artist: Carolyn Crawford

## THE PRIMULACEAE OF COLORADO AND NEIGHBORING STATES

Leader: Dr. Sylvia ("Tass") Kelso

Location: The Colorado College, Colorado Springs

First session: Saturday, April 12, 1997

Second session: Sunday April 13, 1997

Tass Kelso has worked in the primrose family for a number of years and has published extensively, particularly on genus *Douglasia*. This genus occurs to the north of us, and is particularly well developed in Alaska, where Tass did her thesis research. In Colorado, we have representatives in seven primulaceous genera: *Anagallis*, *Androsace*, *Dodecatheon*, *Glaux*, *Lysimachia*, *Naumburgia*, and *Primula*. The same or similar species are present in neighboring states, so the principles learned here will be applicable over a wide area. *Primula*, in particular, is problematic in the West, with many endemic species described. The relationship between these species is not clear, and Tass will bring us up to date on the status of the research.

## THE ULTIMATE ASCLEPIAS WORKSHOP

Co-leaders: Carolyn Crawford, Dr. James Locklear, David Anderson

Location: Piñon Canyon Army Maneuver Area

Classroom session: Saturday, May 10, 1997

Field session: Sunday May 11, 1997

There are nineteen species in the milkweed family in Colorado, eighteen in *Asclepias* and one in *Sarcostemma*. Several are rare, peripheral, or simply overlooked in Colorado. All species will be discussed, but the focus is on the *Asclepiodella* complex, which includes *Asclepias uncialis*, and several other species of small milkweeds that occur in New Mexico, Arizona, Utah, and Nevada. Quite a bit of work has focused on this group in the last several years, with Jim Locklear searching the plains in many sites and David Anderson scouring the Piñon Canyon area. Pressed specimens, alcohol-preserved specimens, and lots of slides will provide plenty of material for participants to study during the classroom session. The following day, we will see *Asclepias uncialis* in the field at Piñon Canyon. LIMITED TO 20 REGISTRANTS!

# A Big Year For The Dwarf Milkweed

## Jim Locklear Nebraska Statewide Arboretum

For the past seven years I have been investigating the biology, ecology and conservation needs of the dwarf milkweed, *Asclepias uncialis* Greene, a rarely-collected plant that may warrant protection as an endangered species. Thanks to the support and involvement of the Colorado Native Plant Society, 1995 was a banner year in the ongoing effort to gain a greater understanding of this species.

*Asclepias uncialis* is spring-blooming wildflower native to the shortgrass prairie of eastern Colorado, where it occurred historically from Weld County south to Las Animas County and in twelve counties in between. Historical collections are also known from Arizona, New Mexico, Texas and Wyoming. While the historical area of distribution of *A. uncialis* is relatively large, field work prior to 1995 had documented only ten isolated, widely-scattered occurrences of two to fourteen plants each throughout this species' entire historical range, totaling less than 100 individual plants.

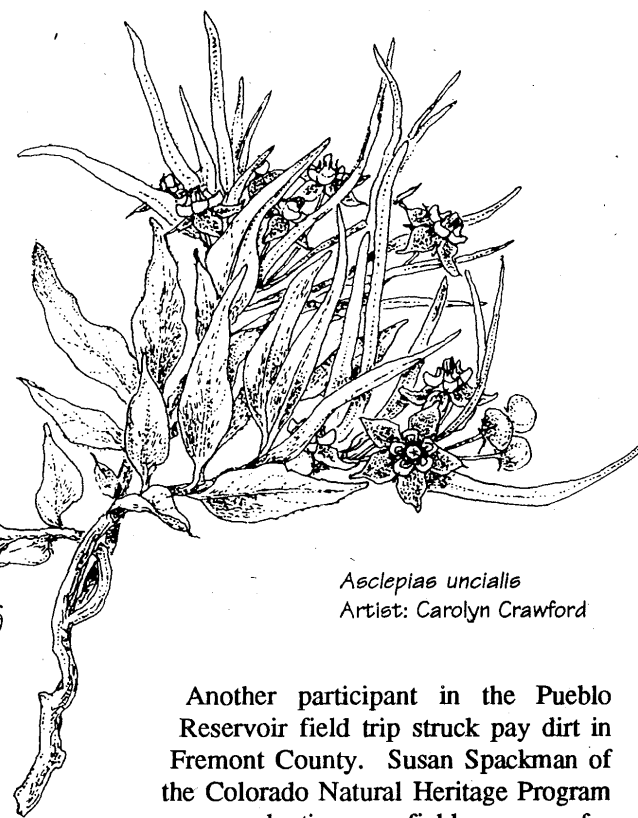
### Field Work in 1995

Several important developments occurred during the 1995 field season. First, through field work funded by the Colorado Natural Areas Program and CONPS, I was able to complete my effort to revisit every historically-known *A. uncialis* collection site in Colorado. This effort has entailed relocating and searching 15 sites in 13 counties. As a result, we now have a good picture of the habitat and ecology of *A. uncialis* throughout its entire historical range in Colorado.

Second, largely because of a 1995 CONPS field trip, we now have four new occurrences of *A. uncialis* and the number of known individuals of this species has been tripled.

On May 6, 1995, about twenty amateur and professional botanists met at the headquarters building of Lake Pueblo State Recreation Area for a field trip organized by CONPS member Jeff Dawson. The goals for the day were to relocate and assess the status of a population of *A. uncialis* found at the reservoir in 1990, and search for additional populations. The results far exceeded anyone's expectations.

When I located this occurrence on the south side of Pueblo Reservoir in 1990, I found only nine plants. By the time the field trip participants finished walking over the same



*Asclepias uncialis*  
Artist: Carolyn Crawford

ground, a total of 48 individuals had been found.

After lunch the group traveled to the other side of the reservoir to search an area where Dr. Jack Carter, formerly of Colorado College, had told me he had seen what he believed to be *A. uncialis* plants in the early 1980s. Before long these now-seasoned milkweed hounds had tracked down another 47 plants.

Other exciting finds would come a couple of weeks later.

Among the participants in the field trip was Dave Anderson, botanist with the Fort Carson Directorate of Environmental

Compliance and Management. After becoming familiar with *A. uncialis* and its habitat at Pueblo Reservoir, Dave and his staff were able to relocate a population of this species that had been discovered at the U.S. Army Piñon Canyon Maneuver Site in 1990. Even more exciting was their discovery of two new occurrences on the Maneuver Site, including one population with 101 plants!

Another participant in the Pueblo Reservoir field trip struck pay dirt in Fremont County. Susan Spackman of the Colorado Natural Heritage Program was conducting a field survey for *Eriogonum brandegei* in the Garden Park area north of Canon City when she discovered a population of 24 *A. uncialis* plants. This occurrence is in the general vicinity of collections of *A. uncialis* made by Townsend Brandegee in 1877 and John Anderson in 1990.

Field surveys of historical collection sites in 1990, 1992, and 1995 have given us a good sense of the ecology of *A. uncialis* in Colorado. The following observations are based on this work.

Continued from page 11—

### Habitat

A typical setting for an occurrence for *A. uncialis* in Colorado would be level or gently sloping (5-10%) terrain with no notable topographic features. However, this species has also been found growing at the base of escarpments and mesas where the slope may be as much as 45%. *Asclepias uncialis* has not been found on rock ledges or outcroppings, and it is not present in highly disturbed habitats such as sand dunes, erosion channels, wash slopes, or badlands. The elevations of historically known occurrences in Colorado range from 1,280 meters (4,200 feet) in Cheyenne County to 1,969 meters (6,460 feet) in Huerfano County.

*Asclepias uncialis* does not appear to be restricted to or associated with any particular soil type. It can be found in soils derived from a variety of sources including sandstone, limestone, and shale. Sandy loam would be the most typical soil type, but *A. uncialis* can also occur in clay soils and in some occurrences substantial amounts of gravel or rock chips are present. It does not occur in pure sand.

Throughout its historical range in Colorado, *A. uncialis* is associated with shortgrass prairie vegetation, typically dominated by blue grama (*Bouteloua gracilis*). In the southeast quarter of Colorado it is sometimes associated with juniper savannah and pinon-juniper woodland, but it always occurs within the prairie component of these habitats. The amount of vegetation cover is about 70-80%, with 80% more typical. Associated vegetation is comprised mostly of grasses, with forbs, shrubs, and trees typically comprising less than 15% of the total vegetation cover.

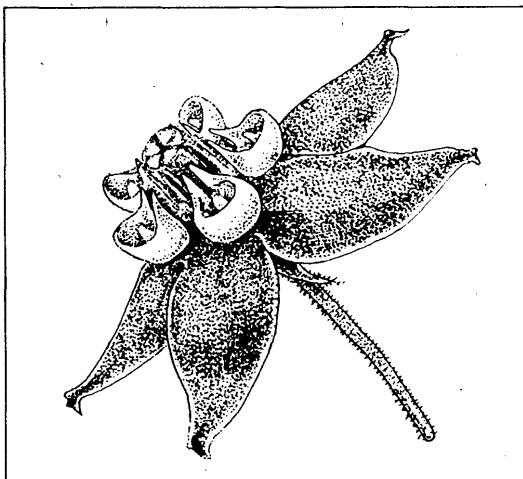
In almost all occurrences, *A. uncialis* grows in small areas of bare soil between patches of blue grama or other short-statured grasses. The grass cover itself is often rather thin, perhaps due to drought, overgrazing, or some other type of disturbance. *Asclepias uncialis* does not occur in weedy, heavily-disturbed sites, and is not found in dense patches of prairie

sod. It is occasionally found in association with cow paths, vehicle tracks (tank tracks at Piñon Canyon!), and animal burrows.

In summary, the most remarkable thing about *A. uncialis* habitat is that there is nothing remarkable about it. Often the rarity of a plant is a function of its association with rare or unique geological formations, soils or microhabitats. This is not the case with *A. uncialis*. Indeed, this lack of habitat uniqueness (along with its small size) makes *A. uncialis* very difficult to find in the field.

### Demography

Field work from 1990 through 1995 confirmed ten occurrences of *A. uncialis* in Colorado, three in New Mexico, and two in



Arizona. No extant occurrences of *A. uncialis* are known for either Texas or Wyoming. Thus, only fifteen occurrences of *A. uncialis* have been found throughout the entire historical range of this species over the past five years.

For the purposes of this study, any seemingly-separate stem or clump of stems was treated as an individual. Based on this method of counting, the total number of individuals of *A. uncialis* observed in Colorado since 1990 is 380. To this number would be added 7 individual plants observed in New Mexico since 1990. Thus, only 387 individuals of *A. uncialis* have been found throughout the entire historical range of this species over the past five years.

### Reproduction

As with all *Asclepias* species, the flowers

of *A. uncialis* are highly modified in structure and require insect visitation to accomplish pollination. The primary pollinators of milkweeds are wasps, bees, moths, and butterflies, although beetles, flies and other insects have been reported as pollen vectors.

Almost no insect activity has been observed to date in association with *A. uncialis*, except for small ants observed on *A. uncialis* flowers at occurrences in Las Animas and Pueblo counties in 1990. There are no reports in the literature of ants serving as pollinators of *Asclepias* species, although one researcher reported large numbers of pollinia, the pollen-bearing sacs produced by milkweed flowers, becoming attached to "nectar-robbing" ants visiting butterfly milkweed (*A. tuberosa*) flowers. Perhaps a study of the possible relationship of ants to *A. uncialis* pollination is warranted.

Field observations in Colorado in 1995 confirmed that *A. uncialis* has a fragrance that can be detected by people. The strong fragrance of *A. uncialis* flowers led to the inadvertent discovery of this plant at the Van Bremer Arroyo on the Piñon Canyon Maneuver Site in 1990. Dr. Dale Zimmerman observed that *A. uncialis* plants at Silver City, New Mexico were "heavily scented with an aroma suggesting rose fragrance or that of *Citrus* blossoms"; he also noted that he could detect the fragrance from two meters away.

Twelve seeds were collected from one of the Piñon Canyon Maneuver Site occurrences in 1995 by Dave Anderson and sent to us here at the Nebraska Statewide Arboretum. We have succeeded in germinating 10 seedlings, and they are growing happily in the greenhouse. Observations of germination and seedling growth may give us further insight into the biology of this species.

### Assessment

Field work in 1995 resulted in the discovery of four new occurrences of *A.*

—Continued on page 13

Continued from page 12—

*uncialis*, and revealed the persistence of three recently-known occurrences. As a result, the number of known individuals of *A. uncialis* now stands at 387, up from less than 100 at the start of the year.

While very encouraging, these results must be balanced with other observations. The most significant of these is the absence of *A. uncialis* from at least eight historically-known collection sites. It appears that *A. uncialis* has been extirpated from these sites.

Based on field studies over the past five years, I have perceived three patterns that point to declining reproductive success as a factor behind the apparent rarity of *A. uncialis* today.

First, although *A. uncialis* appears to be absent from most historical collection sites, native vegetation (including other spring-blooming forbs) still persists at these sites. It appears that the absence of *A. uncialis* from these sites is not due to habitat loss or degradation, but, rather, factors specific to the biology of *A. uncialis*.

Second, in places where *A. uncialis* is found, it occurs in discrete populations of limited size, and is absent from adjacent, often sizable areas of what appears to be suitable habitat. Since *A. uncialis* is pollinated by insects, these isolated populations probably experience little or no gene flow, resulting in a decline in variability and, possibly, genetic fitness over time.

Finally, observations of several *A. uncialis* occurrences over the course of the 1995 growing season revealed extremely low fruit production. *Asclepias* species typically have a low fruit to flower ratio, averaging only one fruit per 100 flowers. However, only one fruit was found among the 230 *A. uncialis* plants of the Piñon Canyon Maneuver Site occurrences, and no fruits were observed among the 95 plants of the Pueblo Reservoir occurrences.

In addition to field work, my study of *A. uncialis* has included search of over 70

herbaria for historical collections of this species. Although this plant is very hard to find in the field, it appears that almost every 19th-century botanist out on the plains in spring collected it. Elihu Hall and J.P. Harbour, who collected *A. uncialis* from the "American Plains, Lat. 41" in 1862, were particularly successful—I have found fourteen duplicate specimens of this collection in eleven different herbaria. The results of my herbarium research indicates that *A. uncialis* was more common in the past than it is today.

The pattern presented by the historical distribution and present ecology and demography of *A. uncialis* is that of a once more common species, now represented by scattered, remnant, possibly declining populations. It appears that the present rarity of *A. uncialis* is the result of unknown circumstances that have led to declining reproductive success and subsequent extirpation throughout much of its former range.

#### Recommendations

While the results of five years of research in Colorado indicate that *A. uncialis* is an endangered species, additional study is needed before this can be stated conclusively.

Field work in 1995 resulted in the discovery of relatively large populations of *A. uncialis* on public land (Pueblo Reservoir State Recreation Area and U.S. Army Piñon Canyon Maneuver Site). These occurrences provide much-needed sites where monitoring and studies of pollination ecology and population biology should be conducted.

While all historically-known collection sites for *A. uncialis* in Colorado have been visited, continued search for this plant is needed. Although it appears that *A. uncialis* has been extirpated throughout most of its historical range, this conclusion should be considered tentative given how very difficult it is to find this plant in the field. Field survey of historical collection sites in Arizona, New Mexico, and Texas is also badly needed.

Finally, biosystematic and phylogenetic studies are needed to clarify the relationship between *A. uncialis* and several other

related species which have recently been lumped together in a treatment of *Asclepias* for a book on the flora of Arizona.

#### Acknowledgements

The John Marr Fund of the Colorado Native Plant Society provided funding toward this research in 1992 and 1995, and this support is gratefully acknowledged. Dave Anderson, Janet Coles, Carolyn Crawford, Bill Jennings, Susan Spackman, and Bill Weber all contributed valuable observations that have been incorporated into this report. Finally, thanks to the participants of the Colorado Native Plant Society's field trip to Pueblo Reservoir for making the effort to learn more about this mysterious little plant.



*Lycopodium americanus*  
Artist: Kris Meiring

## CHAPTER NEWS

## FOR YOUR LIBRARY →

**Metro-Denver Chapter**

Monthly meetings are held at the Denver Botanic Gardens at 7:30 p.m. Room assignments vary, so please check the location for each meeting. Regularly scheduled meetings are held on the fourth Tuesday of each month from September to May, except for the November/December combined meeting.

**December 10—The Geological and Natural History of the Southern Rockies.**  
Morrison Center.

Audrey Benedict, founder and president of Cloud Ridge Naturalists, will present a slide show based on her superb book, *A Sierra Club Naturalist Guide: The Southern Rockies*. She will introduce the region geologically and discuss natural history along an elevational transect, focusing on Colorado. This is the program we rescheduled last spring to avoid a conflict with the mountain peat symposium.

**January 28—Gentians of Colorado & Adjoining States**

Room assignment not yet available. Carolyn Crawford and Bill Weber gave a workshop on gentians three years ago. Carolyn has continued her work with this family along with her husband, Bill Jennings. She will present a photographic slide show of the gentian family and will discuss new information developed since the workshop. Carolyn Crawford is a long-time CoNPS member and an outstanding botanical illustrator.

**ANSWERS****WINTER BOTANY QUIZ:**

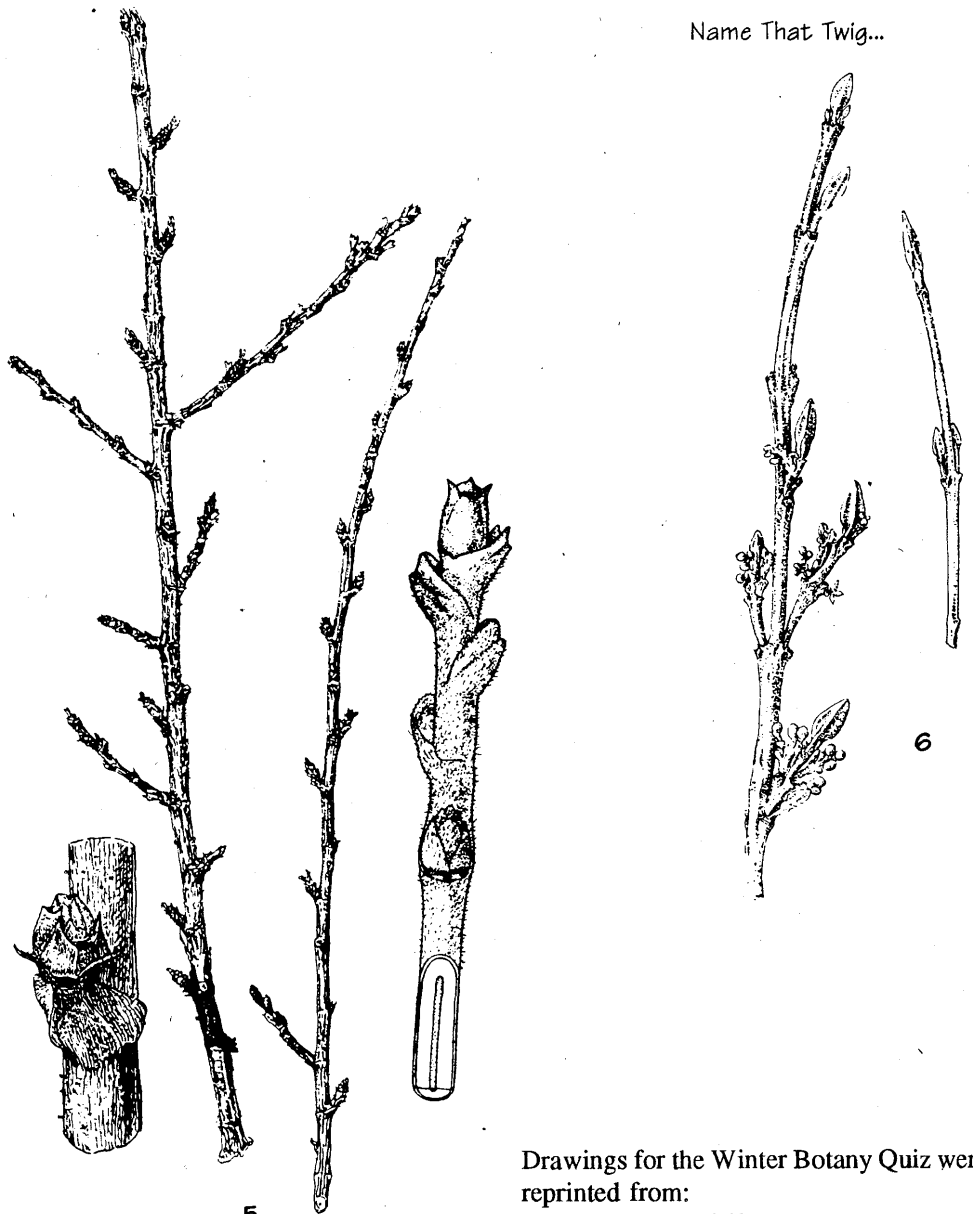
1. spiny hopsage  
(*Atriplex grayi*=*Grayia spinosa*)
2. red osier dogwood  
(*Swida sericea*=*Cornus stolonifera*)
3. chokecherry  
(*Padus virginiana*=*Padus virginiana*)
4. serviceberry  
(*Amelanchier alnifolia*)
5. antelope bitterbrush  
(*Purshia tridentata*)
6. russet buffaloberry  
(*Shepherdia canadensis*)

CONPS is pleased to provide a selection of books to members at discount prices. If you are interested in any of the publications listed on the following page, contact:

Velma Richards  
3125 Monmouth Ave.  
Englewood, CO 80110  
(303) 794-5432



Make check payable to CONPS. Postage costs are additional for books received by mail. If you want to save postage charges, you can pick up the books yourself (from Velma Richards in Denver, Lynn Riedel in Boulder, or Myrna Steinkamp in Fort Collins).



Drawings for the Winter Botany Quiz were reprinted from:  
Hayes, D. W. 1960. *Key to Important Woody Plants of Eastern Oregon and Washington*, U.S.D.A. Handbook No.148.

COLORADO NATIVE PLANT SOCIETY — DISCOUNTED PUBLICATIONS ORDER FORM					
Title	Author	Price Each	Postage Each	Book Total	Postage Total
<i>Alpine Flower Finder</i>	J. Wingate & L. Yeatts	\$ 4.50	\$ 1.25		
<i>Catalogue of the Colorado Flora...</i>	W. A. Weber & R. C. Wittmann	\$ 36.00	\$ 2.00		
<i>Colorado Flora: Eastern Slope</i> (1996 edition)	W. A. Weber	\$ 24.00	\$ 2.00		
<i>Colorado Flora: Western Slope</i> (1996 edition)	W. A. Weber	\$ 24.00	\$ 2.00		
<i>Dictionary of Word Roots</i>	D. J. Borror	\$ 9.00	\$ 1.25		
<i>Field Guide to Colorado Wildflowers - Volume 1</i>	G. K. Guannel (plains & foothills volume)	\$ 18.75	\$ 2.00		
<i>Field Guide to Colorado Wildflowers - Volume 2</i>	G. K. Guannel (mountains volume)	\$ 18.75	\$ 2.00		
<i>Flora of the Great Plains</i>	Great Plains Flora Association	\$ 40.00	\$ 3.50		
<i>Flora of the Pacific Northwest</i>	C. L. Hitchcock & A. Cronquist	\$ 42.00	\$ 3.00		
<i>Flora of the San Juans</i>	S. Komarek	\$ 15.75	\$ 2.00		
<i>Floristic Survey: Black Forest</i>	Anne Maley	\$ 3.00	\$ 1.50		
<i>Grass Varieties In the U. S. A.</i> (1994 edition)	Lewis & Sharp	\$ 35.00	\$ 2.00		
<i>Handbook of Rocky Mountain Plants</i>	R. A. Nelson (revised by R. Williams)	\$ 16.00	\$ 2.00		
<i>How to Identify Grasses and Grasslike Plants</i>	H. D. Harrington	\$ 8.00	\$ 1.50		
<i>How to Identify Plants</i>	H. D. Harrington & L.W. Durrell	\$ 8.00	\$ 2.00		
<i>Illustrated Keys to the Grasses of Colorado</i>	J. Wingate	\$ 7.50	\$ 1.25		
<i>Intermountain Flora: Vascular Plants of the Intermountain West, U.S.A. by A. Cronquist, et al.</i>					
Volume One: Geo-Botanical History/Plant Geography/Glossary/Cryptogams/Gymnosperms		\$ 30.25	\$ 2.00		
Volume Three, Part B: Fabales	R. C. Bameby	\$ 53.60	\$ 2.00		
Volume Four: Subclass Asteridae (except Asterales)		\$ 69.00	\$ 3.50		
Volume Five: Asteraceae		\$ 65.70	\$ 3.50		
Volume Six: The Monocotyledons		\$ 36.00	\$ 3.50		
<i>Life In An Aspen Grove</i> (VIDEO)	CONPS	\$ 20.00	\$ 3.50		
<i>Life In An Aspen Grove</i> (SLIDE/TAPE)	CONPS	\$ 42.00	\$ 3.50		
<i>Meet the Natives, Ninth Edition</i>	M. W. Pesman	\$ 10.50	\$ 2.00		
<i>North American Range Plants</i> (1992 Edition)	J. L. Stubbendeick, et al.	\$ 20.00	\$ 2.50		
<i>Plant Identification Terminology</i>	J. G. Harris & M. W. Harris	\$ 14.50	\$ 2.00		
<i>The Prairie Garden...</i>	R. Brune	\$ 3.25	\$ 1.25		
<i>Prairie Plants and Their Environment</i>	J. E. Weaver	\$ 11.00	\$ 2.00		
<i>Retracing Major Stephen H. Long's 1820 Expedition</i>	G. J. Goodman & C. A. Lawson	\$ 31.50	\$ 2.00		
<i>Rocky Mountain Flower Finder</i>	J. L. Wingate	\$ 3.25	\$ 1.25		
<i>Sagebrush Country: a Wildflower Sanctuary</i>	R. J. Taylor	\$ 9.50	\$ 2.00		
<i>Simplified Guide to Common Colorado Grasses</i>	J. Wingate	\$ 3.25	\$ 1.00		
<i>A Utah Flora</i> (1993 edition)	Welsh, Atwood, Higgins, & Goodrich	\$ 68.00	\$ 3.00		
<i>Vascular Plants of Boulder County, Checklist of</i>	W. A. Weber	\$ 4.00	\$ 1.50		
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# CALENDAR OVERVIEW

## CHAPTER MEETINGS

### Metro-Denver Chapter

- Dec 10** The Geological & Natural History of the Southern Rockies
- Jan 28** Gentians of Colorado & Adjoining States

*Purshia tridentata*  
Artist: A. E. Hoyle



Colorado Native Plant Society  
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## 1996-1997 WORKSHOPS

- Nov 2 & 3** Genus *Haplopappus* & Its Relatives  
with Dr. Gregory Brown
- Dec 7 & 8** Genus *Packera* in Colorado  
with Reneé Rondeau
- Jan 11 & 12** Winter Botany  
with Janet Coles
- Feb 1 & 2** Chihuahuan Desert Flora in Colorado  
with Dina Clark
- Feb 22 & 23** Moonworts  
with Peter Root
- March 15 & 16**  
Orchids of Colorado  
with Dr. Charles Sheviak
- Apr 12 & 13** Primulaceae of Colorado & Neighboring States  
with Dr. Tass Kelso
- May 10 & 11** Milkweeds  
with Carolyn Crawford

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