

# Friends of the Herbarium

The Chico State Herbarium  
California State University, Chico

## Newsletter

Vol. 17 No. 2

December 2011

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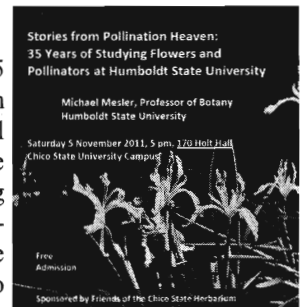
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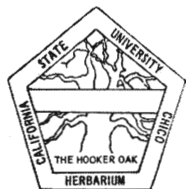
### Friends Annual Meeting

The Friends' Annual Meeting was Saturday November 5 at the Herbarium. The Herbarium was decorated with the photographs taken by the entrants of the first annual plant photo contest for adults 18 and older. There were spectacular close up pictures of flowers and amazing landscapes. The Meeting started off with the announcement of the winners of the photo contest. Following the announcement and awarding of the winners, Barb Castro presented for Lawrence Janeway a brief update of the status of the Herbarium. There has been amazing progress on the geo-referencing and accessioning of specimens due to the diligence of the Herbarium's dedicated volunteers and on top of all of that, the Herbarium collection continues to grow, with approximately 4,000 new specimens waiting to be accessioned! Meeting attendees were then treated to a presentation by the 2011 Jokerst Award winner, Melissa Ha's talking about her research project. Melissa has been studying pollinator-mediated competition and facilitation in the genus *Clarkia*.

The grand finale of the Meeting was the keynote speaker's presentation. Dr. Michael Mesler discussed his 35 years of experience studying flowers and pollinators at Humboldt State University. Dr. Mesler's charismatic and vivid talk took his listeners on a journey into the world of plants whose pollination has been an enigma. Plants such as Trilliums, catchflies, Calochortus, California pitcher-plants, and slinkpods (*Scoliopus* species) were discussed, with beetles, flies, and native bees offered as potential pollinators to examine. He demonstrated how his journey into studying pollinators was often an unexpected byproduct of unanswered questions and curiosity. This curiosity was infectious as all in attendance questioned with Dr. Mesler if the *Asarum* species he was studying really was a self-pollinator or if there was another unknown pollinator hiding out there. The conclusions Dr. Mesler formed was that yes, there was a pollinator, a fungus gnat, but that the plant had also adapted to self-pollinate as well. In addition, he noticed that there were a few other unrelated plant species with similar colored flowers and possibly similar scents, which potentially could be pollinated by this same type of gnat, demonstrating the need for more research. Dr. Mesler ended his talk with this general conclusion – you never know where your curiosity will take you.



-Elena Greg, Friends President



## Friends of the Herbarium

The **Friends of the Chico State Herbarium**, Biological Sciences, California State University, Chico, was formed to help maintain the high quality of work that has been known to be associated with the herbarium. The primary purpose of the group is to provide community support for the herbarium. This includes raising funds for items that are not covered under the University budget. Scientific and academic pursuits are the focus of the group. The Friends also offers low cost workshops and classes on various botanical topics.

The Friends of the Herbarium operates under the auspices of the California State University, Chico, and enjoys non-profit status and has access to the use of University classrooms and equipment.

Memberships are renewed on January 1 of each year.

### BOARD OF DIRECTORS

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### Newsletter

### Volume 17, Number 2

The Newsletter is published one to three times per year by the **Friends of the Herbarium**, Department of Biological Sciences, California State University, Chico. Subscription is free with membership. Submissions on herbarium-related topics are welcome.

### MESSAGE FROM THE BOARD

The end of 2011 in rapidly approaching but the year has brought some excellent workshops and a few new instructors. The Friends of the Herbarium (Friends) Board would like to thank everyone who participated in these workshops from the instructors, to the attendees. The Friends continue to strive to offer high quality workshops and experienced, dynamic instructors. This Winter 2011/Spring 2012 line-up was no exception and we would like you to continue to watch our website for updates as we plan our 2012 workshops lineup. If you have ideas for new workshops, please send them to the Herbarium Curator.

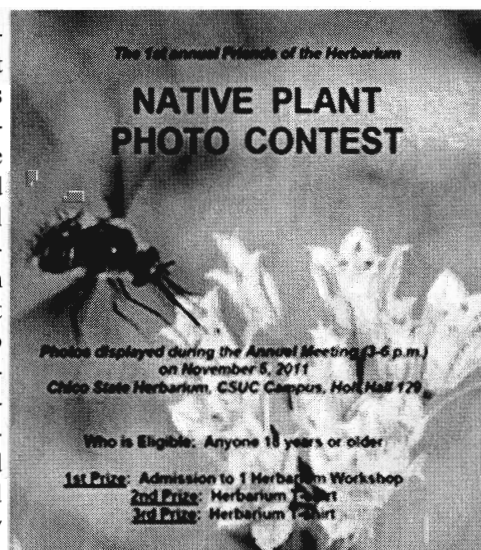
This September, the Friends participated, for the 2<sup>nd</sup> year in a row, in the Annie B Fundraiser and we are pleased to announce that through the generosity of our many supporters, we raised over \$1400.00! The Friends would like to wholeheartedly thank all those who donated to the Annie B drive.

This past May, the Friends hosted the 3<sup>rd</sup> annual wildflower photo contest for middle school and high school students in the region and had an excellent turnout. Based on the increasing popularity of this photo contest, the Friends decided to host the first annual wildflower photo contest for those 18 years and older this Fall. The results of the photo contest were announced at the Annual Meeting on November 5<sup>th</sup>. The winning photos are displayed in this newsletter. This year's keynote speaker at the Annual Meeting was Dr. Michael Mesler who talked on his 35 years of experience with flowers and pollinators at Humboldt State University. We have had a productive year and look forward to an exciting line up of workshops and Herbarium related activities in 2012. We hope you will join us!

It is also **time to renew your Friends membership for 2012**. Membership benefits include workshop discounts, the bi-annual Newsletter and timely announcements.

### First Annual Native Plant Photo Contest

Congratulations to winners and participants of this year's first Native Plant Photo Contest. We received 20 entries which, through their entry-fee donations, raised an additional \$200 for the Herbarium! Winners were announced at the Friends 2011 Herbarium Annual Meeting on November 5 and the photos were on display in the Herbarium during the meeting for the enjoyment of all attendees. First Place went to George W. Hartwell's stunning close-up of *Monardella douglasii* ssp. *Venosa* (Windowpane or Veiny Monardella), a rare and recently rediscovered endemic of the north state. Second Place was taken by John Whittlesey with an intriguing close-up of Showy Milkweed (*Asclepias speciosa*) providing a perch for a pair of grasshoppers and beetles. Two entries tied for Third Place with awards being taken by Robert Fischer for his colorful assembly of ragworts and John Whittlesey for his wet meadow and pond landscape shot. Due to the high quality of submittals judging was difficult and many exceptional images did not place in the top 3. Thank you to all of this year's participants, and we look forward to next year! See the winning photos on Page 5!



## Public Workshops sponsored by Friends of the Herbarium

### NATIVE BEES AS POLLINATORS OF FLOWERS

Most of the flowering plant specimens in the Chico State Herbarium likely owed their existence (before they were pressed) to a seed produced after pollination by a native bee. Some plant groups like grasses, sedges and oaks made seeds after wind pollination, but the majority of the showier flowers needed bees (or other small animals) to make seeds. This word "bees" for many people (unfortunately) simply means "honeybee" --a species that was introduced into California over a hundred years ago and is crucial in crop pollination. However, everyone who likes plants should know that there are numerous species of bees native to the area that provide pollination for flowers in the wild and in our gardens.

Friends of the Herbarium presented a workshop on 28 July to promote appreciation of these numerous native bees. "Introduction to native bees as pollinators in the wild and in your garden" was an all-day event led by Rob Irwin (Sacramento River Conservation Area Forum) and Rob Schlising (Chico State University, retired). On 29 July Rob S. led an optional all-day fieldtrip to high Butte County to see bees on flowers and at nesting sites (photos a-d, f).

#### Bees versus relatives in the order Hymenoptera

To tell bees apart from the related wasps that also visit flowers, examination under a microscope may be needed, especially for "beginners." Technically, bees are separated from other hymenopterans found on flowers by having at least some tiny feather-like (plumose) hairs on the body. Also, patterns of veins in the wings, markings on the bodies, nature of the antennae, and types of pollen-collecting structures on the females provide traits that help provide names. But with experience, people can recognize bee families, genera or even species by their morphology and their *behavior* on flowers in the field. In this workshop, the common, easy-to-recognize honeybee was used as the standard--the bee to which other types of bees could be compared. Rob I. provided scientific, permanent specimens of pinned and labeled bees, and Rob S. provided unpinned, preserved specimens, all to examine along with powerpoint presentations and handouts.

#### Colonial versus solitary bees

The non-native honeybee lives in colonies--either in hives provided by people, or in many cases where the honeybees have "gone wild," in crevices in nature. "Colonial" means that a large number of individuals work together to provide food for the developing young and to protect the hive, while the queen bee lays eggs to produce new individuals. There are some colonial species among the native bees--mainly species of bumblebees. However, bumblebee colonies do not become as large as honeybee colonies, and the colony disintegrates in the fall, leaving only a few new queens that start their own colonies after hibernating alone through the winter.

On the other hand, in species called "solitary bees," each individ-

ual female bee makes her own small nest--often by tunneling underground or in a dry stem or other crevice. Each female collects food for her own little cavity (a "cell"), lays an egg on the stash of food, and seals off the cell. Depending on abundance of resources and on time, female may make a series of cells in a row or make several solitary nests. In nature a number of different females may make their little nests close together in suitable habitat, but in most cases each female is on her own (photos c, d). New adult bees emerge from these nests the next year.

#### Use of flowers by bees: generalizing versus specializing

Flowers provide bee-foods as pollen grains (collected by females to provide for the development of the young) and nectar (used by males and females as a flight fuel, and often used by females to moisten the pollen stash in a bee nest). Typically flowers that have evolved as bee food-sources, produce abundant pollen grains. The loss of pollen that the females take is compensated for by the "accidental" scattering of loose pollen that contacts the stigma and causes pollination and seed set. Although male bees do not collect pollen, their movements in a flower when taking nectar can cause pollination just as can the movements by the females (photo e).

If a bee collects pollen from *many types of flowers*, as in bumblebees, many solitary bee species and obviously honeybees, these bee species are called "generalist" or "polylectic" (collecting many). On the other hand, very many of the native, solitary bees have evolved the ability to collect and utilize pollen from *limited types of flowers*; these bee species are called "specialist" or "oligolectic" (collecting few). Many familiar plants represented in the Herbarium are serviced by oligolectic bees: *Blennosperma* (by a bee with a Latin name honoring the plant--*Adrena blennospermatis*), *Nemophila*, *Limnanthes*, *Downingia*, *Clarkia*, *Calochortus* (photo f) *Calystegia*, *Sidalcea*, *Helianthus* (photo g), and many others. Oligolectic species may visit other types of flowers for nectar, but not for pollen. It is important to note that flowers utilized by oligolectic bees usually have polylectic bees using (and pollinating) them as well.

All the work of provisioning the nests with pollen is done by the females. Males may sleep overnight in flowers (photo h), and in the daytime cruise about searching for females to mate with. Males of some species have interesting behaviors (photo i).

#### Watching bees on flowers: maybe more than first meets the eye

Specialists studying native bees have determined that many *parasitic species of native bees* have evolved. These insects visit flowers for nectar (and thus may serve as pollinators), but they do *not* collect pollen to provision cells for their young. Females of the parasitic species of native bees (photo j) get into nests of non-parasitic bees, leaving eggs behind that grow into larvae that consume food (or young) of the "host" female. A few of the parasitic bee species even look like the host that they parasitize!

There are also other insects found on flowers that have evolved features that may make them look like bees. For example, there are flies (e.g., robber flies, Asilidae) that

Continued on Page 7





a. Workshop participants hunting bees at Butte Creek House; bees were examined in jars, then released. (Gary Zamzow photo)



b. Andrenid bee in glass jar observing student. (Gary Zamzow photo)



c. Nest entrances of 3 solitary female *Diadasia* bees in roadside soil near Butte Creek House; holes +/- 6 mm across. (Robert Fischer photo)



d. Female *Diadasia* leaving turret ("chimney") of nest (see upper left in photo to c.) (John Whittlesey photo)



e. Very large bee: golden male of *Xylocopa* (the polylectic females are black!). Not collecting pollen but possibly a pollinator of this *Grindelia*. (Sandra Kelley photo)



f. Very tiny bee: probably an oligolectic species of *Andrena*--collecting pollen in flower of *Calochortus nudus*. Note size of bee vs. anther. (Jennifer Jewell photo)



g. Female (left) and male *Svastra* (longer antennae), a species of bee oligolectic on sunflower-like plants. (Rob Schlising photo)



h. Male *Melissodes* sleeping overnight on *Rudbeckia*. (Cindy Weiner photo)



i. *Habropoda miserabilis* males clambering to mate with a female on sand. Scramble competition and polygamy! (Rob Irwin photo)



j. Example of a parasitic bee, *Triepeolus*; females do not collect pollen, but both sexes need nectar and can serve as pollinators (Rob Schlising photo)



k. A robberfly (Asilidae) with a "bumblebee appearance," that preys on insects. (John Whittlesey photo)



l. Does this moth (Sphingidae) ward off predators with its bee-pattern? (John Whittlesey photo)



## 3rd Annual Students Photo Contest Results

The 3rd Annual Chico State Herbarium Students' Plant Photo Contest winners were announced during our Open House on May 13. This year we received 37 submittals, seven more than last year and a continuation of the growth trend of this event. Judging was particularly difficult this year due to the high quality of submittals. However, three photos were ultimately chosen as favorites by a voting panel composed of Friends of the Herbarium board members. Drum roll, please.....

Honorable mention goes out to Yana Beeler, Jessie Evans, Keegan Dunn-King, Casie Martin, Katie Pierce, Marissa Chaves, Elizabeth Hamada-Gonzales, Marlowe Embry, Maryn Torricelli, Nicola Farley, and Jake Brown for exceptional submittals. Additional thanks go to Maddi Gruber, Angelika Driscoll, Mackenzie Dowdy, Austin Jones, Thomas Yniguez, Sydney Holderbein, Estefani Ortiz, Tanya Perez, Riley Schader, Sage Johnson, Rebekah Qualls-Neal, Samantha Carver, Constance Brugge, Vanessa Ross, and Brittany Matlock for their submittals.



**1<sup>st</sup> Place – "Spots and Stripes Forever" by Gina Phillipsen of Miller's Hill School.** Gina wins \$100 and free admission to a Herbarium workshop of her choice! Very impressive Gina!!



**2<sup>nd</sup> Place – "Angel's Wings" by Dustin Landis of Pleasant Valley High School.** Dustin wins \$50 and free admission to a Herbarium workshop of his choice! Way to go Dustin!!



**3rd Place - "Flowers" by Nayeli Cordova of Bidwell Junior High.** Nayeli wins \$25 and free admission to a Herbarium workshop of her choice! Nice job Nayeli!!

A special thanks goes to all participating schools, including Pleasant Valley High School, Chico Christian School, Hearthstone School, Central Middle School, Miller's Hill School, Bidwell Junior High School (Ms. Bailey's 7<sup>th</sup> and 8<sup>th</sup> graders deserve special recognition for the biggest contribution from a single school/instructor. Ms. Bailey rocks!!), and, not least of all, the Biology Department and College of Natural Sciences at California State University, Chico, for providing the venue (a big shout-out to Dr. Colleen Hatfield, we couldn't have done it without you!).

-Rod Lacey



**First Place:**  
**George Hartwell**  
*Monardella douglasii* ssp.  
*Venosa* (Windowpane or  
Veiny Monardella)



**Second Place:**  
**John Whittlesey**  
Showy Milkweed  
(*Asclepias speciosa*) with  
insects



**Third Place:**  
**Robert Fischer**  
Colorful assembly of  
ragworts



**Third Place: John Whittlesey**  
Wet meadow and pond

## The donation of a collection and a dedicated volunteer gives the Herbarium one of the most comprehensive collections of slime molds.

In 2008, Dwayne Curtis called me, as the Herbarium Curator, to enquire whether the herbarium would like to receive a donation of his personal collection of myxomycetes (slime molds). Since the herbarium already held a significant collection of slime molds, thanks to Donald Kowalski's donation of his own collection of 8912 specimens during his tenure and shortly after his retiring from teaching at Chico State in 2000, it seemed logical that the herbarium would add Dr. Curtis's specimens to the collection. I went to Dr. Curtis's residence in north Chico soon thereafter and received his specimens and other materials related to slime molds including several books, some collecting supplies, and reprints of a number of his articles. During 2010 and 2011, following the databasing of the earlier herbarium specimens of slime molds, Susan Bazell, herbarium volunteer, databased and processed into the collection 1486 Duane Curtis specimens of slime molds.



Dwayne Curtis with Lawrence Janeway (Curator) donating his myxomycetes collection to the Herbarium

\*\*\*\* Donation letter \*\*\*\*

To: Lawrence Janeway, Curator of the Herbarium  
From: Dwayne Curtis, Professor Emeritus

Collecting of Myxomycetes (slime-molds) for me began in Crater Lake National Park, in southern central Oregon. The park is noted for an abundance of snow accumulation often exceeding 50 feet of depth from November to May. The average annual precipitation is about 70 inches. In contrast, the summer is quite dry. It is common to observe living trees bent from the shifting snow. In many places the forest floor is covered with broken limbs and fallen trees.

Myxos are characteristically associated with moist areas on decaying organic matter such as duff, wood, bark, and fallen twigs. Through the years my collections were expanded to include the states of Idaho, Oregon and, California. All my collections were taken from 2,000 to 7,500 feet elevation.

Each myxo was wrapped in wax paper, dried, and identified.

As a collector, once in a while some spectacular event occurred. For me it was the discovery of *Barbeyella minutissima* Meylan, a new record for the western hemisphere<sup>1</sup>.

It pleases me to donate my Myxomycete collection to the Herbarium or the Department of Biological Sciences at California State University, Chico.

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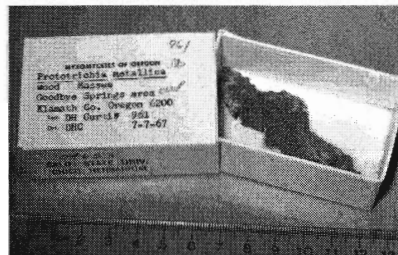
### Slime mold collections are now all databased.

Once Dr. Curtis's Myxomycete specimens were in the herbarium, Rob Schlising organized the collection until accessioning and databasing could take place. Shortly thereafter, herbarium volunteer Susan Bazell started databasing the 8912 specimens that were already in the collection thanks to Donald Kowalski (mostly) and his students, which had been accessioned<sup>2</sup> into the herbarium between 1975 and 1992. Once these collections were databased, Susan went on to accession and database Dr. Curtis's specimens. Thus, between January 2009 and January 2011, Susan single-handedly databased all of the 10,398 specimens of slime molds that are now in the Chico State Herbarium. Quite a task, one that Susan worked through by being in the herbarium for several hours almost every Friday.

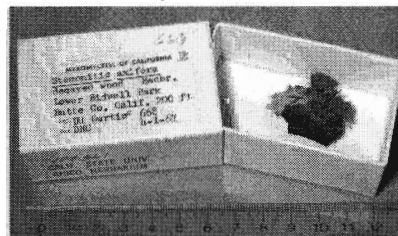
Susan and Rob Schlising also helped the herbarium by being available to host a post-doctoral fellow from Japan for two days last March while she made use of the herbarium collection of Myxomycetes for her research.

It is with sadness that we note that Dr. Curtis passed in the summer of 2011.

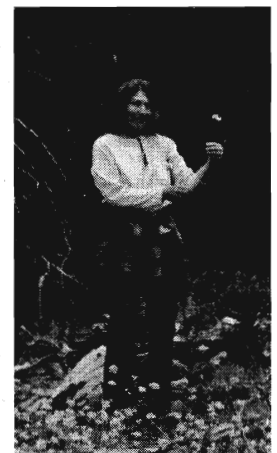
—Lawrence Janeway



*Prototrichia metallica* collected in 1967, Klamath County, OR



*Stemonitis axifera* collected in 1967, Butte County, CA



Susan Bazell single-handedly data-based and processed over 10,000 specimens of slime molds for the Herbarium collection

<sup>1</sup>Curtis, D.H. 1968. *Barbeyella minutissima*, a new record for the western hemisphere. *Mycologia* 60(3):708-710. Dr. Curtis published at least 5 more articles between 1968 and 1972 documenting slime molds in the western states.

<sup>2</sup>Accessioning consists of stamping each specimen with the herbarium name and with an accession number, which is a continuing number starting with the first specimen in the herbarium up to the current number – 107,474. Most of our readers are familiar with the 12" x 18" sheets of high-quality rag paper upon which most vascular plant specimens are glued, but slime molds are stored by gluing them into small boxes which are then stacked into larger boxes in the herbarium cabinets.



*Allium vineale* L.

A new noxious weed in Butte County

By Lowell Ahart, February 2009

In the spring of 2008 I was walking in one of the pasture fields on the Peter Ahart Ranch about 12 miles south of Oroville. As I walked along, I spotted a clump of leaves. I thought of *Poa secunda* ssp. *secunda*. I continued along and I wondered what it was doing in this area (it is scattered about a mile to the east). I backtracked to the clump of leaves. On close observation the leaves were not of a grass but looked more like an onion. I dug a clump and there were many small bulbs. "Is this *Allium amplexans* (the slender form)?" I looked around and found three more clumps. I dug another clump and returned home and planted some in a pot and watered it. It did not do very well and I let it dry up.

During 2009 I continued to water the plants, but they again did not do well. In 2010 I fertilized and watered the onions more faithfully. They did much better and sent up much larger leaves. When about 16 inches tall a leaf split and out came a stem. The only onions that I know that do this are *Allium sanbornii* var. *sanbornii* and *Allium jepsonii*, and these are rare plants.

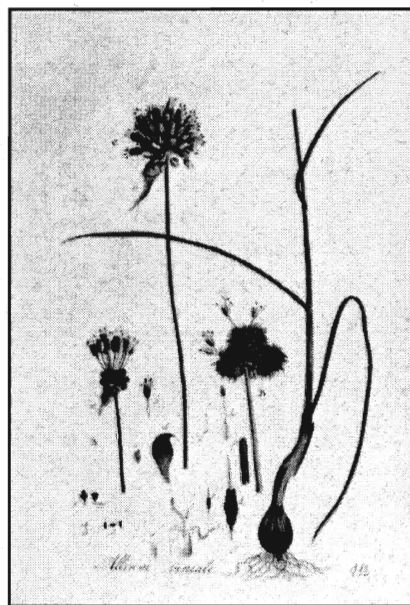
When Barbara Ertter and Matt Guilliams came in early May 2010 for mustards, I showed the onion to them and asked if they knew what it was. Barbara said she did not know, but said there were weedy onions in "The Jepson Manual".

During one of my regular visits to the Herbarium to deliver mounted plants in early June I met with curator, Lawrence Janeway, along with Barbara Castro, Rob Schlising, and Cindy Weiner. Barbara told us about how wonderful the old soil maps were for they mapped odd soil types in the bare hills west of Maxwell. She said if you could find some of these odd soils then you might find an unusual plant. She had found a *Plagiobothrys* and on identifying it found that she had moved its range much farther north.

I mentioned the "odd" onion and described how there were no flowers, but many bulblets. Rob said "Hair!" I asked him what he meant and he got a vase which contained the same *Allium*. The commercial form is called Hair (see Beck's bulb catalog). I asked Rob to email the Latin name. He emailed the next day after he had looked in mail order catalogs. Unfortunately the only name the catalogs gave was 'Allium Hair'. The '*Allium*' was in italics (Latinized) but the word 'Hair' was not. Rob speculated that perhaps Allium Hair was a fairly recent horticultural discovery that didn't yet have a Latin name. However, I checked on the internet and found that Allium Hair was listed as *Allium sphaerocephalon* L.

With this information I was able to complete a plant label. I removed the plants from the pot and prepared those with flowering stems for mounting for both the Chico State Herbarium and also for Barbara Ertter at Berkeley.

When I got out my Jepson Manual and looked for *Allium sphaerocephalon*. It was not in the Manual. "That's odd", I thought, and remembered Barbara said



JanKops et al.—Flora Batava

there were weedy *Alliums* in it. So I tried the Allium key. The first couplet is "Flowers generally replaced by bulblets; weedy" vs. "flowers never replaced by bulblets." So right away I went to *Allium vineale*! I searched the Jepson Interchange and the Consortium and found six collection locations in California. I checked Calphotos and they are what I collected. So I am fairly certain this is the correct identification.

This is the hard way to find out what a plant is. *Allium vineale* is a Noxious Weed and is a new record for Butte County, but **All right!!**

**NATIVE BEES AS POLLINATORS OF FLOWERS**

(Continued from page 4)

eat other insects, including bees. Does the fly's evolved appearance (photo k) fool bumblebees into visiting flowers within nabbing-range? And then, there are several types of hawkmoth (Sphingidae) that may appear (at least to humans) somewhat like a bumblebee; does this *potentially stinging* insect have some protection from animals that may eat it (photo l)? Both types of bee-look-alikes mentioned are often referred to as evolutionary "bee mimics."

Considering all this, many bee workshop participants still note that learning native bees is a challenge (but, of course, so is learning sedges, or grasses, willows, sunflowers and other groups of plants--all of which have been covered in Friends' workshops). But participants also now appreciate that *native bees* are common, diverse, interesting and beautiful in their forms and their behaviors, and that the word "bee" must not equate only with "honeybee." Native bees in the field (and in the garden) are worthy of patient and careful observation by people that like flowers.

## Yes! I would like to join/renew!

\_\_\_\_ Student ..... \$20.00  
\_\_\_\_ Individual ..... \$35.00  
\_\_\_\_ Sustaining ..... \$100.00  
\_\_\_\_ Lifetime ..... \$1,000.00

Contribution to the Jim Jokerst Award \$ \_\_\_\_\_

\_\_\_\_ Donation ..... \$ \_\_\_\_\_

This is a renewal for 2011 .....

Please make your check payable to: Friends of the  
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Name \_\_\_\_\_

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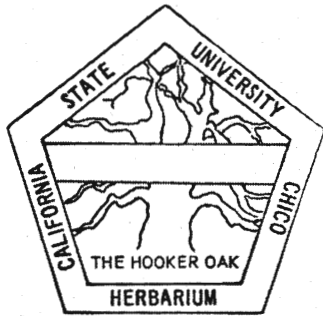
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## Friends of the Herbarium

**The Chico State Herbarium**  
**California State University, Chico**

**TIME TO RENEW YOUR MEMBERSHIP FOR 2012**

**TIME TO RENEW YOUR MEMBERSHIP FOR 2012**

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