



# THE JEPSON GLOBE

A Newsletter from the *Friends of The Jepson Herbarium*

VOLUME 28 NUMBER 1, Spring 2018

## Curator's Column: Cryptic diversity revisited

By Bruce G. Baldwin

In early February, the California Native Plant Society hosted its fourth conservation conference focusing on California's native flora and vegetation. Among the timely topics addressed at the meeting was cryptic diversity and its implications for conservation management. In particular, the focus was on the growing number of previously overlooked species that have been discovered recently based primarily on molecular (usually DNA) data. These taxa can often be difficult to diagnose or identify based on morphological characteristics (that is, they are morphologically cryptic). A panel, representing a diverse set of scientific and management perspectives, was convened by Aaron Sims and Nick Jensen to discuss this topic and included Leigh Johnson (Brigham Young Univ.), Julie Kierstead Nelson (Shasta-Trinity National Forest), Teresa Sholars (College of the Redwoods/Mendocino College), and me.

The discussion that ensued demonstrated much progress in thinking about taxonomy and conservation over the past 20 years and illustrated the thoughtfulness that is being applied to many new botanical discoveries in California.

There was recognition that a higher priority should be placed on characterizing and communicating the minor morphological differences between taxa rather than emphasizing how

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Bob and Evelyn Berman, 1985.

## In appreciation: Bob Berman's generous gift to Herbaria Futures

In February of this year, Bob Berman made a generous donation to the endowment fund Herbaria Futures in memory of his wife, Evelyn. With his contribution to Herbaria Futures, Bob's gift will support the infrastructure and care of the collections housed in the University and Jepson Herbaria where Bob volunteered for five years after he retired from a long career at UC Berkeley. Funds from Herbaria Futures are also used to cultivate the next generation of botanists, ecologists, and conservationists, an important issue to Bob and to all of us who want to support these fields of study and encourage others to join our community.

Bob was born in San Diego and attended San Diego State College where he received a B.A. in Biology. He next attended Claremont Graduate School where he received a teaching credential.

(Continued on page 2)

## The changing funding landscape of the Herbaria

By Brent D. Mishler

The annual budget of the University and Jepson Herbaria is comprised of five primary types of funding: (1) support from the UC Berkeley campus (funds provided by the State of California), (2) annual distributions from endowment funds designated for the Herbaria, (3) grant funding, (4) private giving by individual donors including the *Friends of the Jepson Herbarium*, and (5) revenue from the Jepson Workshops and other sources.

This funding structure is significantly different from what it was when I became director in 1993. At that time, the majority of the funding for the University and Jepson Herbaria came from the State of California. Special projects such as *The Jepson Manual* (1993 UC Press) were supported with endowment return and volunteers, along with targeted grant funds and gifts.

Over the past 25 years, the biggest change in the funding structure of the herbaria has been a steep reduction in funding provided to our department from the UC Berkeley campus. For example, the current amount of State funding allocated to our department is half of what it was in 2007. This is

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ALSO IN THIS ISSUE



**JEPSON WORKSHOPS  
CELEBRATE 25 YEARS!**

(Funding, continued from page 1)

a massive loss and is indicative of a continuing trend that shows no sign of slowing down. There are many reasons for the steady reductions in state funding to the University of California, and our department is certainly not alone—every department on campus has had significant decreases in funding.

Despite a changing funding landscape, our widely acclaimed efforts in research, curation, outreach, and formal education have remained successful and have continued to grow. To a considerable extent, we have been able to compensate for the continuing decline in state funding by the addition of new endowment funds, a greatly accelerated pursuit of extramural grant funding, initiating and developing the Jepson Public Programs, and the increasing generosity of our individual donors. While these new sources of funding are essential for maintaining and growing our public-facing programs, basic infrastructural needs have remained a concern. Such needs are difficult to fund through grants (which are designed to support new programs), thus we have always reserved our State funds for core infrastructure, and now, as those funds


dwindle, we need to find other sources to support our core activities in collection management and curation.

In past years, when our department has received a budget cut, I have managed it in a variety of ways, with big impacts to our infrastructure coming from often being unable to fill positions of staff members who retired. Under this solution, our department has been reduced in size but mid-career employees were not affected. Unfortunately, this fiscal year, facing additional budget cuts, and with nowhere else to reduce costs (due to previous cuts), we sadly lost a key position, that of Assistant Director for Collections.

The Collections Management staff are now running as a skeletal crew. They are still managing ~2,200,000 specimens including a world-class fern collection, especially from the New World tropics, a top-notch marine algae collection, and extensive bryophyte, lichen, and fungal collections. They are responsible for managing our on-line specimen databases (including the Consortium of California Herbaria), processing all incoming and outgoing loans (approximately 2,000 specimens per year), mounting new accessions,

databasing them and filing them in the collection (more than 10,000 specimens/year), maintaining the library and archives, responding to research queries, overseeing activity on two large grants (digitizing microfungi and facilities upgrades in the Silva Center for Phycological Documentation), and managing the volunteer program. These core activities are the infrastructural foundation of the University and Jepson Herbaria, on which we are able to build our research and outreach programs.

Gifts to the Herbaria Futures Endowment Fund are a long-term investment in the core herbarium activities described above. We are grateful to Bob Berman for his recent gift (see cover story) and encourage others to join him by contributing to Herbaria Futures with a donation of cash or securities, including the Herbaria in your estate plan, listing the Herbaria as a beneficiary on your retirement accounts, or by directing your mandatory IRA distribution to the Herbaria.

For more information, please contact Staci Markos, Assistant Director for Development & Outreach, at (510) 643-7008, [smarkos@berkeley.edu](mailto:smarkos@berkeley.edu) or visit us online; [ucjeps.berkeley.edu/](http://ucjeps.berkeley.edu/) 


(Berman, continued from page 1)

Bob intended to teach high school biology but at the time the only openings for biology teachers were inland, and, preferring coastal living, Bob chose a position in Monterey teaching 5th grade. Although he got along well with his young students, he decided to look for a profession where he could more directly apply his knowledge of biology.

One morning, with his curriculum vitae in hand, he entered the employment office at UC Berkeley and, to his surprise and delight, was offered the position of Research Associate in a lab connected to the School of Public Health. He enthusiastically accepted and found himself with an interesting group of people studying various aspects of California Valley Fever (i.e., coccidioidomycosis). After eight years of research with this group, plus

several co-authored papers, he was feeling the need for a change and this was the beginning of a new career as curator of the microbial collections for the Department of Botany. He stayed in that position until he retired in late 1984, after a total of 33 years with the University.

While waiting for his wife Evelyn to retire, he became a volunteer in the Jepson Herbarium. Initially, Bob worked with Susan D'Alcamo overseeing the *Friends of the Jepson Herbarium*. When the effort began to produce *The Jepson Manual* (published in 1993 by UC Press), Bob became very interested. As a microbiologist, he lacked some of the skills for work with higher plants and Jim Hickman, Editor, kindly and patiently came in with the help needed so that Bob could contribute to the revision.

When Evelyn retired, they moved to Pacific Grove. After 18 wonderful years, they decided it was time to be near family and they returned to the Bay Area. Evelyn passed away in September 2017 and, shortly after, Bob moved to Eureka, California, to be near his son, Kenneth. The arrangement has worked well and Bob has been able to keep in touch with Bay Area friends. Bob enjoys reading *The Jepson Globe* and hearing about current projects at the Herbaria, old friends, and new faculty and students. With a deep appreciation for the time he spent at UC Berkeley and for what the Herbaria represent to the scientific community, and to inspire others to invest in the Herbaria, Bob provided a generous gift that will add to the foundational support provided by the endowment fund Herbaria Futures. 



# Celebrating 25 Years of Jepson Workshops



This year the Jepson Herbarium workshop program is celebrating its 25th year! This momentous occasion has been made possible by the Friends of the Jepson Herbarium, our knowledgeable and generous expert instructors, our talented and thoughtful program coordinators, and each and every workshop participant (over 9,000 since 1994!).

The workshop program represents an important component of the outreach and service that the Jepson Herbarium provides to the



broader community and has provided many different experiences to a wide variety of botanists. We invite you to share your stories with us; please post pictures from your favorite workshops at [#jepsonworkshops25](#), tell us how the workshop program has affected your life and/or career (see below), and attend the celebration we are planning for September 22nd (in Berkeley, more details to follow). 📷

Photos from previous years' workshops, top left to right: *Flora of the Anza-Borrego Desert* with Jon Rebman. Also pictured Thor Henrich and Pete Garcia. *Arctostaphylos* with Tom Parker and Mike Vasey, also pictured Chuck Quibell. *Juncaceae* with Barbara Ertter. Bottom left to right: *Southern Sierra* with Jim Shevock. John Game and Jeff Greenhouse in Anza-Borrego State Park.



## How has the Jepson workshop program helped you grow?

- Email to [jepsonworkshops@berkeley.edu](mailto:jepsonworkshops@berkeley.edu). Use subject line *Jepson Workshop Memories*.
- Share your memories: [#jepsonworkshops25](#)
- Save the date September 22, 2018, for a special celebration in Berkeley.



## Revision 5 reveals more of the diversity of North American Orobanchaceae root parasites

By Alison Colwell

Revision 5 of the *Jepson eFlora* includes the most recent steps in an ongoing overhaul of the taxonomy of Orobanchaceae. The most noticeable change is in the key to genera: native species of *Orobanche* are now named *Aphyllon*. This name change is a reversion to the first published name for these plants, from Thomas Mitchell's 1769 doctoral dissertation, which included new finds from the Virginia Colony. Returning *Aphyllon* to use in print acknowledges the evolutionary distinctness of the New World lineage, which appears to include an ancient colonization of North America, probably via Beringia, followed by speciation and recent colonizations of South America via migratory birds. *Aphyllon* is distinguished in the current Jepson key by its calyx with five more or less equal lobes. In contrast, the Eurasian species that pop up in farm fields and landscaping have a more or less bifid calyx with only four prominent lobes.

Two other notable changes occur within *Aphyllon* section *Gymnocaulis* (now section *Aphyllon*) that formerly contained only the distinctively long-

pedicelled *Orobanche uniflora* and *O. fasciculata*. The first change was made in recognition of the genetic and ecological differences between the eastern and western US *Aphyllon uniflorum*. The western entity is now *Aphyllon purpureum*. This epithet, from the original name of this western species, refers to the tendency of populations to have some degree of purple

in their flowers. The second change is the addition of a new species, *Aphyllon epigalium*, with two subspecies. Found in dry, forested slopes in montane areas from central Oregon to southern California, *Aphyllon epigalium* combines traits of both the few-flowered *Aphyllon purpureum* and the larger, more floriferous *Aphyllon fasciculatum*, but has a unique host, *Galium*.


These changes (and more to come) are the result of two major efforts: a new treatment of Orobanchaceae for *Flora of North America North of Mexico* (due out later this year) and molecular studies on this section, led by Adam Schneider.

The *Flora of North America North of Mexico* treatment work on *Orobanche/Aphyllon* brought loans of North American specimens of both native and non-native species from dozens of herbaria in North America and Europe together at the Missouri Botanical Garden, affording an unprecedented ability for George Yatskievych, Turner Collins and myself (FNANM treatment authors) to observe variation and



This is a striking lemon yellow Oregon variant of *Aphyllon* on *Galium oreganum*. Photo by Tanya Harvey.

distribution. The lion's share of these specimens, almost a thousand, were named *Orobanche uniflora* and *O. fasciculata*. These two species had perplexingly variable color and corolla shape, and covered continent-wide ranges with an enormous amplitude of habitats. Previous attempts to subdivide them had not been widely accepted. As an exercise to sort the variation, we tried arranging specimens geographically or by color and flower shape; no patterns appeared. However, when specimens were narrowed to those few with definitive host information on the label (or better yet, a host pressed on the sheet with its connected parasite), and then sorted by host, suddenly morphological and ecological patterns emerged.

The next big break came when Adam Schneider was enticed to tackle this section for his dissertation work. Adam improved sampling (from both field work and herbarium specimens) and added more genes to the DNA sequence dataset. Adam cleverly focused on obtaining specimens on unusual host species and this strategy has revealed that there are at least six distinct evolutionary lineages within section *Aphyllon*, each on different hosts/host groups. The lineage on *Galium* appears in this *Jepson eFlora* revision, the others will appear in future iterations of the *Jepson eFlora*. 



Adam Schneider selfie with new taxon *Aphyllon epigalium* subsp. *notocalifornicum* (host *Galium andrewsii*) in the Agua Tibia Mountains of San Diego County just before it became collection Schneider 1029.

## Jepson eFlora Revision 5, December 2017

Revision 5 involves treatments that have changed taxonomically (e.g., taxa added or deleted) since Revision 4 of the Jepson eFlora (2016). A summary of the changes incorporated in the eFlora is presented below and online ([ucjeps.berkeley.edu/eflora/supplement\\_summary.html#rev5](http://ucjeps.berkeley.edu/eflora/supplement_summary.html#rev5)).

### LYCOPHYTES

#### Selaginellaceae:

*Selaginella kraussiana* added, as naturalized

### ANGIOSPERMS

#### Apiaceae:

*Lomatium dissectum* var. *multifidum* elevated to species rank as *Lomatium multifidum*, leaving no varieties in *Lomatium dissectum*

*Lomatium ravenii* var. *piutense* newly described, added, as native

*Lomatium ravenii* var. *ravenii* recognized, as native

*Orogenia* transferred to *Lomatium*, *Orogenia fusiformis* changed to *Lomatium fusiformis*

*Sphenosciadium* transferred to *Angelica*, *Sphenosciadium capitellatum* changed to *Angelica capitellata*

#### Asteraceae:

*Antennaria sawyeri* newly described, added, as native

*Helianthus winteri* newly described, added, as native

#### Crassulaceae:

*Sedum citrinum* newly described, added, as native

#### Ericaceae:

*Pyrola chlorantha* removed, not in California

*Vaccinium shastense* newly described, added, as native

*Vaccinium shastense* subsp. *nevadense* newly described, added, as native

*Vaccinium shastense* subsp. *shastense* recognized, as native

#### Linaceae:

*Linum trigynum* added, as naturalized

#### Onagraceae:

*Oenothera primiveris* subsp. *bufonis* no longer recognized, leaving no subspecies in *Oenothera primiveris*

#### Orobanchaceae:

All native taxa of *Orobanche* transferred to *Aphyllon*

*Orobanche ramosa* changed to *Phelipanche ramosa*, leaving no *Orobanche* in California

*Aphyllon epigalium* newly described, added as native

*Aphyllon epigalium* subsp. *epigalium* recognized, as native

*Aphyllon epigalium* subsp. *notocalifornicum* newly described, added, as native

*Aphyllon robbinsii* newly described, added as native

*Orobanche bulbosa* changed to *Aphyllon tuberosum*

*Orobanche uniflora* (misapplied; not in California) changed to *Aphyllon purpureum*

Other *Orobanche* names are not listed here, most have slight modifications in the ending of their epithets (as a result of being transferred to *Aphyllon*).

#### Themidaceae:

*Triteleia piutensis* newly described, added, as native



*Vaccinium shastense* subsp. *shastense*.  
Photo by Steve Matson.



*Antennaria sawyeri*, Eastern Trinity Alps, Middle Peak. Photo by Julie Kierstead Nelson.



## Critical access and storage for a unique collection of mistletoes

Drs. Carol Wilson, Clyde Calvin, and Brent Mishler have been awarded a grant from the National Science Foundation to house, image, and database the unique mistletoe and haustorial collections of the University and Jepson Herbaria (UC/JEPS).

To the best of our knowledge, this collection represents the largest herbarium collection of mistletoes in the world, surpassing the collections in the world's largest herbarium, the National D'Histoire Naturelle, Paris (about 14,514 mistletoe specimens), and the USA National Herbarium (about 6,000 mistletoe specimens). The collection at UC/JEPS will also be the broadest herbarium collection of mistletoes, including representative taxa from all regions of the world in three families, Loranthaceae, Viscaceae, and Misodendraceae, that are wholly or largely composed

of mistletoes. The UC/JEPS collection will be a significant research resource for scientists and land-resource managers that is not duplicated elsewhere, and that includes unique haustorial specimens that are rarely collected.

Mistletoes are shrubby, aerial-branch parasites belonging to order Santalales with most species assigned to the three families included in this grant. Mistletoes are largely hemiparasites that, while photosynthetic, obtain water and mineral nutrients and a portion of their carbon from the xylem sap of their terrestrial hosts. Haustoria of parasitic angiosperms are the connection between the parasite and host, which in mistletoes is a woody structure comprised of the host branch, the root or stem of the parasite at the attachment site, and associated intermingled host and parasite tissues.

Some mistletoes have a negative impact on forest ecosystem health particularly when forests are under stress from drought, pollution, and/or pest infestations. The significance of mistletoes as structural and nutritional resources that positively influence forest diversity has been relatively recently recognized, leading to the understanding of mistletoes as keystone resources in forests. Studies have documented positive relationships between mistletoe occurrence and species richness, especially between mistletoes and birds.

With this funding, a compactor system with 44 new cabinets will be installed to house herbarium sheets and haustoria (stored in specialty boxes). The collection will integrate approximately 19,200 herbarium sheets and almost 1,000 haustoria that are currently housed as four separate collections. These include 4,700 UC/JEPS sheets and three recently acquired voucher collections from mistletoe experts. One collection was donated by the USDA Forest Service and comprises study vouchers of **Dr. Frank Hawksworth** who focused on *Arceuthobium* (Viscaceae) of the US. During his lifetime, Dr. Hawksworth authored more than 250 scientific publications on forest diseases and was the world's authority on *Arceuthobium* (dwarf mistletoes). **Dr. Job Kuijt**, a UC graduate (Ph.D., 1960), donated more than 10,800 sheets representing mistletoes worldwide. Dr. Kuijt has, to date, published more than 150 scientific publications on parasitic plants and described about 250 species during his 50 plus years of botanical studies at the University of Lethbridge, Alberta, Canada, and after his retirement as a research associate at the University of Victoria, British Columbia. **Drs. Clyde Calvin and Carol Wilson** (UC graduate, Ph.D., 1996), who are researchers in UC/JEPS, donated approximately 1,200 sheets and about 1,000 haustoria representing their

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Two representative Loranthaceae herbarium sheets with small host branch mounted on the upper right and mistletoe on the left. Above each herbarium sheet is an image of the associated haustoria. On left is the small-flowered *Passovia pyrifolia* that has epicortical roots that grow along the host branch, forming attachments at multiple sites. On right is the large-flowered *Psittacanthus schiedeanus* that forms a single attachment that causes extensive host tissue proliferation called a wood rose.

(Mistletoe, continued from page 6)

worldwide fieldwork on mistletoes. These collections are the basis for more than 35 scientific publications on the haustoria, phylogeny, and biogeography of the Loranthaceae and Viscaceae.

Herbarium sheets will be imaged and made available through the University and Jepson Herbaria Specimen Portal (online) and shared with several national and international web resources. The PIs will work with undergraduates from the UC undergraduate research apprenticeship program (URAP) on a study of the taxonomy and biogeography of Loranthaceae. Undergraduate students will also be trained in curatorial methods while assisting with the curation of haustorial collections, and trained in digitization and metadata development for museum collections while assisting with digitization of herbarium sheets.

In recommending this proposal for funding the NSF panel and reviewers were particularly impressed by the uniqueness of the collection and the importance of mistletoes to forested ecosystems worldwide. In evaluating

the likelihood of the project to enhance scientific and technical knowledge, they cited the long history of public workshops and lectures at UC/JEPS. 



*Mistletoe, Psitticanthus schiedeana (in flower), growing on legume host tree, Leucaena esculenta. Photo by V. Marquardt during a trip to Pueblo, Mexico.*

## THE JEPSON GLOBE NOW AVAILABLE ELECTRONICALLY

Current *Friends of the Jepson Herbarium* can elect to receive the *Globe* newsletter by email only instead of a paper version by mail.

Call 510-643-7008, or email Staci Markos: [smarkos@berkeley.edu](mailto:smarkos@berkeley.edu).

Past *Globes* from June 2003 to Spring 2017 are available online here:

[ucjeps.berkeley.edu/jeps/globe/](http://ucjeps.berkeley.edu/jeps/globe/)

### MEMORIAL AND HONORIFIC GIFTS

The University and Jepson Herbaria are pleased to offer thanks to those who chose to honor or remember others with gifts to the herbaria.

*In memory of Herbert & Irene Baker*  
Peter Kenmore

*In honor of Bob Berman*  
Delia & John Taylor

*In memory of Deborah Doubledee*  
Rebecca Doubledee

*In honor of John Game and  
Jeff Greenhouse*  
Anna Larsen

*In memory of James C. Hickman*  
Carole S. Hickman

*In memory of Robert Lloyd*  
Theodora Lee Gregg

*In memory of Elizabeth McClintock*  
Carlyn Halde

*In memory of Roderick Park*  
Mary Beth Burnside

*In memory of Charles Hicks Quibell*  
Charles & Kati Quibell

*In memory of Roger and Marian Reeve*  
Paul & Diane Reeve

*In memory of Kevin Rickey*  
Lorrie Bundy

*In memory of William & Genevieve  
Sattler*  
Alfred & Barbara Sattler

*In memory of Paul Silva*  
Susan Brawley  
Kathy Ann Miller

*In honor of Alan R. Smith*  
Beth Alexander  
Leslie Leve  
Dana Luis

*In memory of Dr. Robert Wert*  
Dr. Frederick W. Coe



## Increased UV radiation, because of decreased ozone, significantly affects conifer reproduction

Jeff Benca, a graduate student working with Cindy Looy, Curator of Gymnosperms, recently published a study in *Science Advances* that determined pine trees become temporarily sterile when they are exposed to ultra-violet radiation.

His results have several implications and they lend support to the idea that ozone depletion, caused by immense volcanic eruptions that occurred at the end of the Permian Period, contributed to the planet's largest mass extinction, approximately 252 million years ago.

In modern times, ozone holes have developed as a result of the use of chemicals that destroy atmospheric ozone. Because the ozone layer protects all life from excessive UV rays, in par-

ticular UV-B wavelengths, which cause mutations in DNA, holes in the ozone concern scientists.

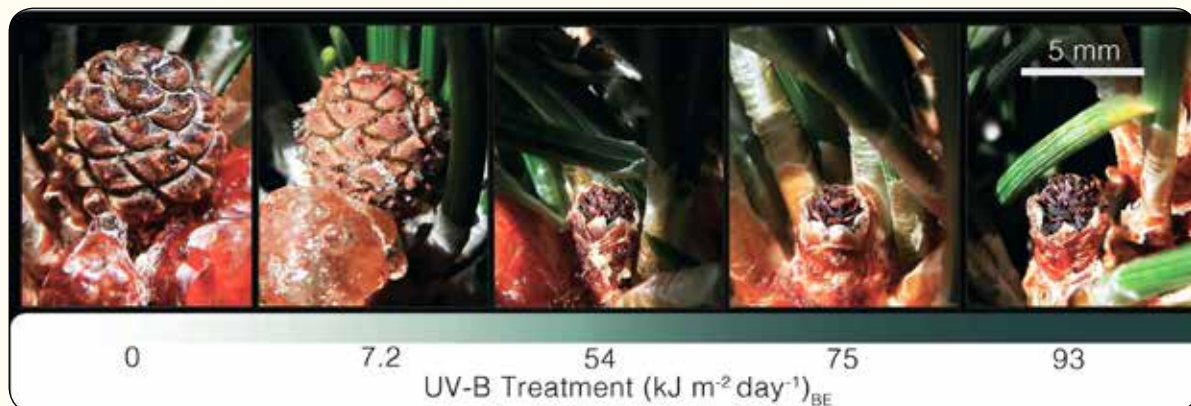
Malformed pollen grains have been observed in 252-million-year old microfossils but researchers were not able to determine a mechanism for how pollen might have been damaged. Jeff's study asked the question, do high levels of UV-B cause malformed pollen grains similar to what has been observed in the fossil record?

To conduct his experiments, Jeff used a dwarf pine cultivar (selected for bonsai) that readily produces pollen and seed cones. He exposed the dwarf pines to 7.5, 10, and 13 times the normal UV-B intensity found in Berkeley. At the medium and extreme exposures, 12 to 15 percent of pollen grains were

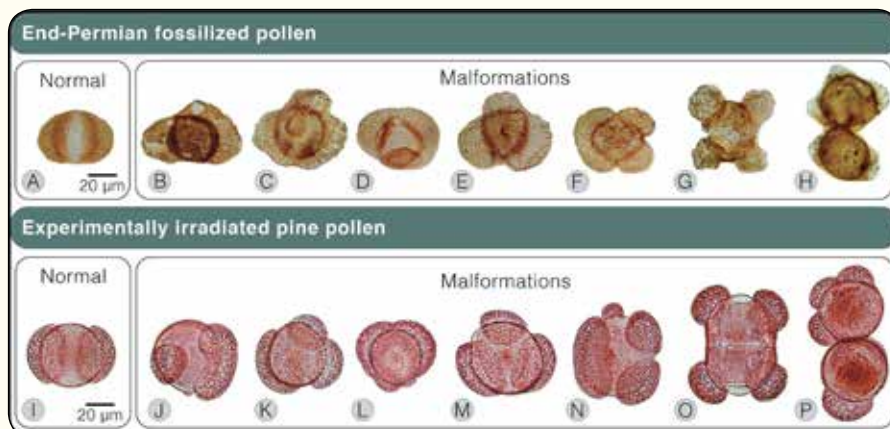
misshapen, versus 3 percent in normal and low-exposure trees. These pollen abnormalities are indeed similar to abnormalities observed in microfossils.

A second result surprised Jeff—in addition to damaging pollen, the trees' seed cones would shrivel and die before reaching the appropriate level of development, which meant fertilization could not take place. Despite an otherwise healthy looking tree, the entire lifecycle was disrupted by exposure to UV-B light.

Jeff's study offers a cautionary note; damage to the ozone layer may have negative impacts on the reproductive success in some plants and that could have large-scale effects throughout the food web. 🌿



Normal seed cones of the pine tree (left) compared to shriveled cones produced when the pines were irradiated with UV-B light. Photos by Jeff Benca.



Fossilized pollen from the Permian (top) and pollen from Jeff's experiment (bottom), where *Pinus mugo* was exposed to high levels of UV-B light. Figure by Jeff Benca.



Jeff Benca with one of the dwarf pines used in the experiment. Photo by Robert Sanders, Manager, Science Communications, UC Berkeley



## The Jepson Videos: Visual Guides to the Plants of California

We are pleased to announce the debut of a new project, The Jepson Videos: Visual Guides to the Plants of California, a YouTube channel where we will be posting short videos on how to identify California plants.

([www.youtube.com/c/Jepsonherbarium](http://www.youtube.com/c/Jepsonherbarium)).

We hope these introductory videos can be used in a variety of ways, including a review of the characters needed for basic plant identification, formal and informal teaching, and broader appreciation of the flora. To date, we have produced five videos: *Sequoia sempervirens*, *Baccharis pilularis*, *Umbellularia californica*, *Scoliopus bigelovii*, and a video describing four *Acacia* taxa.

Please subscribe to our channel and share it in your networks!



*Scoliopus bigelovii*.  
Photo by Aaron Schusteff.



*Acacias*, clockwise from top left: *A. dealbata*, *A. longifolia*, *A. melanoxylon*, and *A. baileyana*. Photos by Staci Markos.



*Umbellularia californica*.  
Photo by Joanna Clines.

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## News from the Silva Center for Phycological Documentation

With an award from the Institute of Museum and Library Services, the library and archives of the Silva Center for Phycological Documentation have been re-housed in compactor style shelving and bookcases specialized for the preservation of rare books.


The resources of the Center include the nomenclatural database *Index Nominum Algarum*, a superb library of rare literature, and the archives of Paul Silva, G.F. Papenfuss, and W.A. Setchell, three of the most influential phycologists of the last 130 years. As

part of the grant, herbaria archivist Amy Kasameyer is consolidating the archives (e.g., correspondence, fieldbooks, manuscripts) of Silva, Papenfuss, and Setchell. They will be stored in archival boxes in the compactors and their inventories will be available online.

In their new home, the resources of the Center are more secure and will be cared for in an environmentally controlled room that will foster preservation of the rare books and valuable archives. This will ensure that generations of botanists, researchers, historians, and students can gain access to these extensive archives and publications in the field of phycology and beyond.

As part of his estate plan, Paul Silva established an endowment fund to support the Center. The proceeds of that fund have been used to host Dr. Ga Hun Boo, from South Korea, who is now concluding his studies on Pacific seaweeds under the supervision of Curator of Algae, Dr. Kathy Ann Miller. Dr. Boo will soon be departing

Berkeley to continue his post-doctoral work at the Natural History Museum in Paris.

The Center welcomes visitors and requests for information from the international community. Please contact Kathy Ann Miller ([kathyanmiller@berkeley.edu](mailto:kathyanmiller@berkeley.edu)) and visit the Center's web site: [http://ucjeps.berkeley.edu/CPD/algal\\_research.html](http://ucjeps.berkeley.edu/CPD/algal_research.html). For information about the *Index Nominum Algarum*, please contact Richard Moe ([rlmoe@berkeley.edu](mailto:rlmoe@berkeley.edu)). 



New rare book storage is lockable and protects items from UV light exposure. Fragile items have been enclosed in protective housings..



The newly installed shelves are properly braced for seismic events and provide significantly more storage than the previous shelves.

## Recognizing Lifetime Members

We thank Timothy and Joan Kask, Anna Larsen, Paul Licht, John Rawlings and Sara Timby, Stephen Rosenthal, and Stella Yang and Stephen Buckhout for becoming Lifetime Members in the past year! With an investment of Lifetime Membership, these special *Friends* have demonstrated their dedication to the Jepson Herbarium and its mission and provided vital support for programs including the Jepson Workshops and the *Jepson eFlora*.

Each year, Lifetime Members gather for brunch with the Director and Curator where they share ideas and discuss strategies for future planning. This year, on April 29th, we have a special opportunity to visit Garland Ranch Regional Park, in Carmel Valley, with Michael Mitchell, author of several publications including *Wildflowers of Garland Ranch* (by Michael Mitchell and Rod Yeager), *The Plants of Monterey County – an Illustrated Field Key*, second edition (Mary Ann Matthews & Michael Mitchell), and *Monterey County Wildflowers – a Field Guide* (Rod Yeager and Michael Mitchell). In addition to these books, Michael's website ([www.montereywildflowers.com](http://www.montereywildflowers.com)) is a photographic guide to approximately 950 taxa found in Monterey County.

If you've been considering joining as a Lifetime Member, now is a great opportunity! 🍷

Left: *Madia elegans* and *Clarkia lewisii*, taken on the East Ridge Trail in Garland Ranch Regional Park. *Clarkia lewisii* is ranked 4.3 on the CNPS Rare & Endangered Plant Inventory but is often found in abundance in Garland Ranch. Photo by Michael Mitchell.



### SUPPORT THE HERBARIA

Name(s) \_\_\_\_\_  
Address \_\_\_\_\_  
City, State Zip \_\_\_\_\_  
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(Curator's column, continued from page 1)

difficult they are to distinguish and how molecular data played such a pivotal role in their discovery. The term "cryptic" itself may be worth reconsidering because it emphasizes the difficulty of identifying such taxa rather than their interesting and often ecologically important differences. Oftentimes, morphological differences between so-called cryptic taxa can be easily seen depending on the condition of the plant material. For example, a pair of taxa that are morphologically indistinguishable when in flower or fruit might be easily distinguished when in the basal rosette stage, prior to bolting. In other cases, taxa that can be easily distinguished when alive and flowering become easily confused after being pressed and dried in preparation to be herbarium specimens. An understanding of when to collect and what information or images to record prior to collecting could go a long way toward simplifying identification of such taxa.

A progressively pragmatic approach to recognizing and conserving taxa that may be difficult to identify was exemplified by Julie Kierstead Nelson, who expressed dedication in the US Forest Service to giving all defensible taxa

full conservation consideration insofar as practicable. From a management perspective, the need for taxonomists to provide agency botanists with enough morphological, ecological, and distributional information to take on the job of identifying and protecting sensitive plants is key. Another legitimate concern is that focusing precious resources on conserving taxa of dubious veracity is hard to justify. Everyone present agreed that taxonomists should meet an especially high standard of evidence for recognizing truly cryptic taxa.

As Convening Editor of the Jepson Flora Project, I work with our staff and team of authors to pursue revisions of *Jepson eFlora* treatments for genera and families that have been revisited taxonomically, with special attention to those with new species and infra-specific taxa of conservation concern. That process includes evaluation of newly described cryptic taxa, so the challenges addressed by the panel are highly relevant to our work and we thank all who participated for contributing to the discussion. Revisions of the *Jepson eFlora* are made possible with the support of our *Friends* and we thank each of you for your investment in the Herbarium. 

### Curatorial Volunteers Needed at the University and Jepson Herbaria!

Are you interested in: a) learning more about the California flora b) gaining first-hand experience with herbarium techniques, c) providing much-needed assistance with the specimens that are the raw data on which our knowledge of the California flora is based, d) socializing with fellow native plant enthusiasts, e) all of the above? Then have we got a deal for you! One Saturday of each month is a Group Volunteer Day in the Herbaria.

We also welcome individual volunteers who can come in during our regular hours (M–F 8–5). To be added to the Group Volunteer reminder list or for more information about volunteer opportunities, please contact Ana Penny (510) 642-2465, or e-mail: [apenny@berkeley.edu](mailto:apenny@berkeley.edu)

Remaining Group Volunteer Saturdays for spring semester are below. Saturday volunteer days resume in September. Group Volunteer Saturday begins at 10:00 am and finishes up by 4:00 pm (participants need not stay the full time).

APRIL 21 (Cal Day)

MAY 12

### JEPSON HERBARIUM RESOURCES & PROJECTS RELATED TO THE CALIFORNIA FLORA

Approximately 400,000 plant specimens from California

**Director:** Brent D. Mishler  
California Phylodiversity Project  
Systematics and ecology of *Syntrichia*

**Jepson Curator:** Bruce G. Baldwin  
*Jepson eFlora*

Systematics and evolution of Calif. tarweeds and relatives (tribe Madieae, Compositae), *Chaenactis* (Chaenactidiaceae, Compositae), and *Collinsia* (Plantaginaceae).

**Curator of Ecology:** David Ackerly  
Ecology and evolution of California flora  
Climate change impacts and conservation strategies

**Curator of Ferns and Lycophytes:** Carl Rothfels

Divergence and hybridization in Californian ferns and lycophytes (especially *Notholaena*, *Cystopteris*, *Isoetes*).

**Curator of W. N. Am. Botany:** Barbara Ertter, *Flora of Mount Diablo* and flora of the East Bay, North American Potentilleae

**Asst. Director for Development & Outreach:** Staci Markos, *Jepson eFlora*, CCH & *Globe* editor

**Biodiversity Informatics Manager:** Jason Alexander

**Collections Staff & Plant Identification:** Kim Kersh, Ana Penny, and Margriet Wetherwax

**Archivist and Librarian:** Amy Kasameyer

**Public Programs:** Allyson Ayalon

**Membership, workshop enrollment, and *Globe* design:** Edith Summers

**Staff Research Associate:** Bridget Wessa

**Jepson Videos:** Staci Markos, Allyson Ayalon, Amy Kasameyer

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***Wetland Delineation***

May 9 – 11, 2018

***California's Native Bees: Biology, Ecology, and Identification***

May 16 – 20, 2018

***The Flowers Formerly Known as Mimulus***

May 17 – 20, 2018

***Alpine Flora of the Colorado Rocky Mountains***

July 19 – 22, 2018

***Introduction to Fire Ecology of the Sierra Nevada***

August 2 – 5, 2018

***Ferns***

August 18 – 19, 2018

***GIS for Botanists***

September 29 – 30, 2018

***Introduction to Lichen Microscopy***

October 13 – 14, 2018



*Polystichum andersonii*. Photo by John Game.