THE JEPSON GLOBE

A Newsletter from the *Friends of The Jepson Herbarium*

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Curator's Column: Larry Heckard's Enduring Legacy

By Bruce G. Baldwin

This spring, April 9th marks a century since the birth of Lawrence R. ("Larry") Heckard (1923–1991), my immediate predecessor as Curator of the Jepson Herbarium and a beloved figure in the history of California botany. Coincidentally, Dr. Heckard was born on the very same day (in the same year) as my father, which is fitting in the sense that I have looked to Dr. Heckard's example in trying to steer my role as Jepson Curator over the years, as my dad provided important guidance in my life. Sadly, I never had the opportunity to meet Dr. Heckard, who passed before I was hired at Berkeley, just as he never had the opportunity to meet Willis Linn Jepson but faithfully worked to fulfill Dr. Jepson's vision for the Jepson Herbarium.

To that end, Dr. Heckard initiated and contributed in diverse and critical ways to the mammoth effort that led to publication of *The Jepson Manual: Higher Plants of California* in 1993. Prior to that project, he and James C. Hickman, who served as Editor of *The Jepson Manual* (1993), brought to light the great diversity of plant life in the Snow Mountain region of the southern High North Coast Ranges through a major floristic study of that wilderness area, which was subsequently designated by President Barack Obama as part of the Berryessa Snow Mountain National

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Brent in Norway in 2019.

Brent Mishler is Stepping Down as Director of the University and Jepson Herbaria in June 2023

By Staci Markos

As Brent Mishler prepares to retire, we thought it was important to reflect on his 30 year tenure as Director (1993-2023) and his leadership of the University and Jepson Herbaria. I sat down with Brent in February 2023 and had a conversation with him about his legacy at UC/JEPS. What I heard reinforced what I have known for a long time, that Brent is a true scholar, naturalist, conservationist, innovator, collaborator, and mentor.

As we begin the transition to new leadership, we wish Brent the very best and offer our sincere thanks for making UC/JEPS a hub of cutting-edge research, an epicenter of service, and a wonderful place to work where everyone has the opportunity to engage

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The Bruce and Penelope Gallaway Fund for Moorea Botany

By Brent D. Mishler

This past fall, I had the pleasure of working with Bruce and Penelope Gallaway to establish a new fund that will provide support for UC Berkeley students, staff, or faculty to travel to the UC Berkeley Gump South Pacific Research Station on Moorea, French Polynesia, to conduct field work. The fund will also support the management of specimens and data derived from botanical research projects conducted at the Station and its vicinity. Initial projects will focus on the flora of Moorea using specimens already housed in the University Herbarium, with a goal of updating the *Moorea Digital Flora Project* (*ucjeps.berkeley.edu/moorea/index.html*). These specimens were collected by undergraduate students that participated in the UC Berkeley "Biology and Geomorphology of Tropical Islands" class, for which I have been one of the on-site faculty members for 30 years. I have mentored hundreds of excellent students in the program and look forward to continuing the work that has been initiated.

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in meaningful work, build fruitful collaborations, and make life-long friends. On October 14, 2023, we will be hosting a Member's night to celebrate Brent's accomplishments and welcome the incoming director, Lúcia Lohmann.

How did you get interested in botany and mosses in particular?

As a young boy in La Verne California, I was interested in motorcycles and airplanes. I had a job at a local pizza place and a mediocre GPA. I surprised everyone with a good SAT score (so much so that I had to retake it under close supervision to make sure my score was legitimate!). After high school graduation, I wanted to study aircraft mechanics but needed to improve my GPA before applying to a four-year college. I enrolled in Mt. San Antonio Junior College where I was required to take a few breadth courses, including science. I selected botany and through that choice, my life took a different course. I liked the class so much that I asked my professor if one could make a living in the field; he encouraged me to continue my studies. I took his advice and upon completing my 2-year degree, I transferred to Cal Poly Pomona to pursue botany as my primary field of study. Having grown up in Southern California, I was interested in the chaparral and wanted to work in chaparral ecology. One of my advisors encouraged me to work on mosses because, at the time, not very much work had been done on them and so the field was wide open for an eager student. He sent me out to "collect some mosses" in the foothill chaparral above San Dimas. I eventually found over 70 different species (including what was then known as *Tortula*)! So, one could say I started studying mosses by accident but after those first collecting trips, I was hooked. I spent five years at Cal Poly Pomona where I received a bachelor's and a master's degree. The title of my thesis was "Mosses of the chaparral" but it was misread at graduation as "Moses of the chaparral!" I had been to a few professional meetings and met Bob Thorne (a very well-respected Curator at Rancho Santa Ana Botanic Garden) and when I asked him what I should do next, he advised me to pursue a Ph.D. and suggested I apply to Harvard, where to my delight, I was accepted to continue my studies with Norton Miller, Carroll Wood, and Peter Stevens, and worked on systematics of *Tortula* (*Syntrichia*)!

What was the environment like in the Herbaria when you started as Director?

In 1993, I came to UC Berkeley as a faculty member in the Department of Integrative Biology, with the additional appointment as the Director of the University and Jepson Herbaria. That appointment was only for a five-year term, with possibility of appointment to one more term. But they must have liked what I was doing as they continued to extend the appointment!

Bruce Baldwin, Rod Park, and Brent Mishler on a UC Merced scouting trip in 2000.

In those days, the university as a whole, including the Herbaria, had significantly more funding from the State of California and as a result, there was a much larger staff. Rod Park, who had been serving as the Interim Director, took me under his wing and shared with me his vast knowledge and experience of administering an academic unit at a large research university. I didn't have any administrative experience and I learned a great deal from Rod and valued his mentorship.

In 1993, the Herbaria was not in VLSB; it had been temporarily relocated to a building in Oakland (while VLSB was being remodeled). Barbara Ertter was the lead person in charge of the move and the redesign of the Herbaria space. *The Jepson Manual* (1993) had just been published and the SMASCH project was up and running (databasing specimens with support provided by NSF).

Rod had warned me that budget cuts were on the horizon, so I quickly had to make tough decisions about where to put our collective energy. Continuing to work with the *Jepson Friends*, who supported the publication of the 1993 *Manual*, was one of my top priorities. Together with Susan D'Alcamo, I started the Jepson Workshop Program in 1994 with an emphasis on teaching people how to identify plants in difficult taxonomic groups like Compositae, Poaceae, *Lupinus*, and *Carex*. My next priority was to oversee our move back to VLSB (in 1995) and work with the staff to obtain NSF support for new compactors. I was also focused on hiring a new Jepson Curator because sadly, Larry Heckard passed away in 1991, just before I arrived. We made a good choice: Bruce Baldwin!

There have been many changes since those early days but the bedrock of the Herbaria has remained solid. The space that houses the collections, our *Friends* program, and our research programs all continue to be excellent.

What have been the most significant changes in academia since you started?

Research has gotten more expensive – not only have the methods significantly changed (and required more funds to support them), the overall cost of supporting graduate students has increased. This has resulted in a greater entrepreneurial responsibility for professors, each one has to find extramural funding for their research. This has also started to change the dynamics

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Gift of New Ethnobotany Collection to UC/JEPS

In the fall of 2022, the Herbaria received a special donation of 149 plant specimens from Fiji. The specimens were collected from 1971-1973 by Dr. Michael Weiner during his Ph.D. research on nutritional ethnomedicine. During his research, Dr. Weiner worked with Fijian healers and practitioners to learn how the plants were used and this detailed information was kept in field journals and was later published. An excerpt of the ethnobotanical information will be included with the specimens (on a label that will be placed in the packet, see fig. 1).

Dr. Weiner holds Master's Degrees from the University of Hawaii in medical botany and medical anthropology and a Ph.D. from UC Berkeley in Health and Medical Science. Since completing his degrees, Dr. Weiner has written 20 books that draw on his expertise in the field of nutritional ethnomedicine.

With a generous gift to the Herbaria Futures Endowment fund and an additional gift to support a UC Berkeley student, Grace Lanouette, the specimens are being mounted, databased, and imaged. It is our pleasure to now be the stewards of this collection!

Fig 2 – *Pometia pinnata* (Sapindaceae) collected on Beqa Isle, Savusavu Kalou, Fiji in 1972. Native name, Dawalo. A medicinal plant used as a remedy for "sickness inside chest."

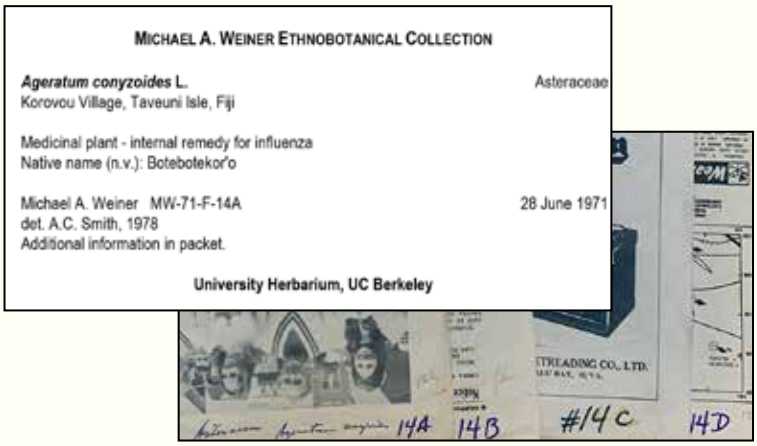

Fig 1 – Medicinal plants used in combination as an internal remedy for influenza.

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The course offers a transformative field research experience that many students consider the capstone to their years at Berkeley. It begins with 3 weeks of intensive lectures and training on the UC Berkeley campus that provide the contextual framework for the remainder of the course. The students then depart for approximately 10 weeks at the Station. While in Moorea, students design and execute their own independent research projects, starting with the initial preliminary studies and ending with statistical analyses and writing. The final weeks are spent back on the Berkeley campus where students write up their findings and prepare a professional seminar on their projects.

It is truly wonderful to have the opportunity to continue the botanical work we have been doing in French Polynesia and to know that students will be involved in the process of helping us accession hundreds of specimens that have been collected over the years. I thank the Gallway's for their generosity and support of a new generation of tropical botanists!

www.moorea-ucb.org/

Penny and Bruce Gallaway in the Vaipahi Botanical Garden on Tahiti. Photo by Brent Mishler.

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with the graduate program. There is now a tendency to constrain graduate student dissertation topics to projects that the major professor has funding for. This industrial model of research and teaching is changing the landscape for professors and students. Gone are the days when students were free to explore and choose a topic they were interested in pursuing, as I did.

What do you most enjoy about your work?

As a professor, there is a lot of freedom to think and pursue your ideas. At R1 universities, teaching requirements are not too burdensome – about half my time is spent on research. Every day is different and interacting with students keeps things interesting! I've taught a wide array of classes including freshman seminars, advanced graduate classes, and field classes. It is truly rewarding to see students grow.

As Director of the Herbaria, I've been fortunate to work with a great staff and over the years, we have significantly improved the physical collections, and through digitization grants we have increased access to the specimens and their data – about ½ of our specimens now have label data served online (that is also shared with global networks). We have also significantly expanded the in-person and online services and resources provided by the Herbaria. A good team of high-functioning people is needed to operate the Herbaria at this level and one of the things I have been diligently working on is to build the endowments so that we may continue to support the people we need to do all that we do. I'm proud to say that since I began as Director, I have had the good fortune to work with many *Friends* and donors and we have significantly added to the endowments that support the Herbaria. Two staff members, completely supported by endowments, have recently joined the Herbaria and as we continue to build Herbaria Futures and the other program-specific endowments, we will have the resources to add more staff. Our next goal in this regard is to add a Scientific Editor for the Jepson Flora Project.

Brent Mishler at the Herbaria's Holiday Party in 2022. Photo by Staci Markos.

Shirley Tucker and Brent Mishler at Member's Night honoring Shirley and the establishment of a new endowment supporting the position of the Tucker Curator for Lichenology (2016). Photo by Ana Penny.

What have been the greatest successes or accomplishments in your career?

Success is a curious word. How does one define success? To me, there are many different kinds of success and I feel that several aspects of my career have been successful. I've appreciated all of the opportunities I've had to interact with and mentor students. I've been fortunate enough to engage in several different research areas: bryophyte systematics and ecology, land-plant phylogeny, the species problem, development of the Phylocode, and most recently, spatial phylogenetics. I've traveled a lot and collaborated with people from all over the world. I've increased the level of endowment funding for the Herbaria and therefore helped support its future. My career has been immensely fulfilling to me!

What were the greatest challenges you faced at work?

Since I have been director, the Herbaria has received a budget cut 27 of the 30 years I have served. There has never been an increase in state funds. When it comes to university budgets, there are many intricacies but the bottom line is that UC Berkeley is shifting its administration style toward a more business-like model. Time will tell how that strategy plays out.

You've had many collaborative research projects and built good relationships with colleagues. Is there one project that stands out in your mind as being particularly enjoyable and/or impactful?

I would have to say Deep Green because it led to so many collaborations and it had a huge impact on the field of botany. Deep Green was a collaborative project that focused on developing phylogenies of green plants. It was a massive effort with collaborators from many institutions. Funded in 1994 by USDA, the Department of Energy, and NSF, Deep Green set the stage for a future funding program at NSF, Research Collaboration Networks (RCNs). The botanists became so well organized and adept at collaborating on research that the history of botany was affected by this large scale project which led to many, many more collaborative works. The culmination of Deep Green was a gathering of participating botanists at the 1999 Botanical Congress in Missouri. There were eight symposia with seven presentations each (a total of 56 talks on the phylogeny of green plants!). The project was so successful that NSF featured results from the Deep Green project in their report to Congress. Subsequent RCN grants included Deep Gene (evo-devo) and Deep Time (integrating paleobotany).

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Welcome Nina House!

I am so grateful and humbled to be working at such a prestigious institution as the University and Jepson Herbaria. As a Museum Scientist, I will be working both on coordinating the Jepson Workshop program and on revising the *Jepson eFlora*. I am so excited to merge my interests of botany and outreach, and to work with so many incredible botanists!

I grew up in upstate New York, where I completed my bachelor's degree in biology at the State University of New York at Oswego in 2017. I began my botany career when I moved to southern California that same year. I worked with the Palos Verdes Peninsula Land Conservancy for a short time as a Restoration Program Intern. In 2018, I started working as a Seed Conservation Intern at the California Botanic Garden (CalBG). These jobs were my first introduction to the California flora, and I was quickly hooked!

I began my master's in botany at CalBG (Claremont Graduate University) in 2019, with Dr. Naomi Fraga as my advisor. For my thesis, I completed a floristic inventory of the Manter and Salmon Creek watersheds in the southern Sierra Nevada, Tulare County, California. These watersheds make up a 51 sq. mi. section of the Kern Plateau dominated by montane coniferous forest, large montane meadows, and montane chaparral. They also include

Nina House with *Dryas drummondii* (yellow mountain-avens) in Kachemak Bay State Park, Alaska (July 2022). Photo by Peri Lee Pipkin.

the southernmost population of *Pinus balfouriana* subsp. *austrina* (foxtail pine) and the tallest waterfall south of Sequoia National Park, Salmon Creek Falls (137 m, 450 ft)! Approximately half of the study site was in the Domeland Wilderness, an area with few herbarium specimen records documenting plant diversity. Throughout the project, I completed a total of 24 field trips, totaling 90 field days, and collected 1,412 herbarium specimens. These have been identified and deposited at CalBG, with duplicates sent to other herbaria. The primary goal of this project was to produce an annotated checklist of the regional flora, which will be ready for publication later this year.

I am passionate about conservation, botanical field work, floristics, science communication, montane and riparian ecosystems, natural history collections, and public policy. It has become increasingly clear throughout my career that research does not occur in a vacuum. We cannot conserve and protect plants if we cannot get other folks also excited about conserving and protecting them! This is especially important at the policy level, but also at the individual level – which is why I'm so excited to be working with the Jepson Workshop program!

Outside of school and work, I enjoy reading, embroidery, hiking, camping, traveling, trying new foods, photography, spending time with my friends and cat, and visiting my friends, family and dog in New York. I'm looking forward to meeting new people and exploring my new home in the Bay Area!

Nina House at the Herbarium

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Do you plan to continue scholarly activities post retirement?

Yes, definitely. I especially want to continue working on bryophytes and on spatial phylogenetics and continue to explore new approaches to the analysis of big data sets.

What other activities have you engaged in or plan to engage in during retirement?

I'd like to continue traveling, to see parts of the world I haven't been to yet. I've been a leader for ecotourism tours for Cal Discoveries and those are wonderful opportunities to interact with curious Cal alumni in new places. This fall, I will be going to East Africa and I am really looking forward to the trip!

What message would you give the next director?

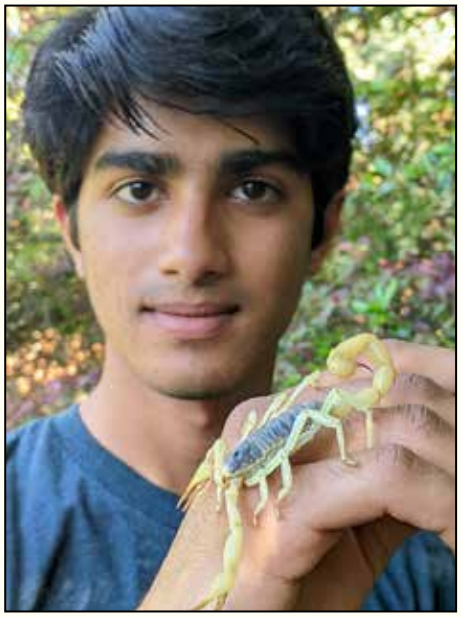
Much of the work done by the director is done behind the scenes representing the unit, and sometimes it can feel like swimming in a shark tank, but with regard to campus, the two things to really pay attention to are space and money – frequent targets of other departments and higher-level administrators! On a more positive note, the Herbaria is a welcoming, inclusive, and exciting place to be and the *Friends* are an amazing support group! I am 100% sure that the new Director, Lúcia Lohman, will do a great job!

Embrace Curiosity and Expand Your Horizons Through Programs Offered by the Jepson Herbarium

The University and Jepson Herbaria are part of the consortium of Berkeley Natural History Museums that hold over 12 million voucher specimens in anthropology, botany, entomology, herpetology, mammalogy, ornithology, and paleontology.

Collaborations between the museums can lead to remarkable projects and offer unique opportunities for students. The story below, written by Prakrit Jain, describes one such collaboration and the amazing impact the museums had on the life of one curious student.

In April of 2013, when I was 8 years old, I received news that UC Berkeley's Dr. Peter Oboyski was offering a Jepson Herbarium workshop "What's Eating You? A Natural History of Insect Herbivores." At that time, much like today, I was fascinated by entomology and this workshop sounded irresistible. Upon trying to sign up, however, much to my disappointment, I discovered that the workshop was unavailable to those under 18 years old. That night, I emailed Dr. Oboyski with a summary of my entomology interest and experience, something that I imagine probably just looked like a list of my favorite insects I had found. A few days later, I received an invitation to the event provided a parent would accompany me. I remember excitedly sitting in the front of the class, answering every question I was able to, eager to learn anything I could. Since then I have attended dozens of bioblitzes, talks, and events with Dr. Oboyski, Dr. Kip Will, and other UC Berkeley entomology faculty, each of which has taught me something new about research, fieldwork, wildlife biology, and more. These same professors provided me guidance when, five years later, I began my first independent research project, an examination of scorpion behavior under ultraviolet light. One year at Cal Day, I was invited to show live scorpions to visitors at the entomology booth in the Valley Life Sciences Building courtyard. As time progressed, I continued my research on scorpions, eventually focusing on the fields of ecology and evolutionary biology. In 2022, Harper Forbes, Lauren A. Esposito, and I published a paper where we describe two new species of scorpion – *Paruroctonus soda* and *Paruroctonus conclusus*.



Prakrit Jain holding a scorpion (*Hadrurus obscurus*). Photo by Prerna Jain.

In the fall of 2022, almost 10 years after my first encounter with the Jepson Herbarium and the Essig Museum of Entomology, I began my undergraduate studies at UC Berkeley! I am excited to continue my studies at the institution that has given me so much inspiration and guidance over the years. I am continuing my work on scorpion taxonomy and have started working on reptile morphology as well. The Berkeley Natural History Museum faculty and events have been one of my greatest sources of education in the fields of ecology and evolution I am most interested in and have played a crucial role in my research journey so far.

Carol Wilson Receives Prestigious Award for Her Work with *Iris*

In 2022, Carol Wilson was awarded the **Foster Memorial Plaque** by the British Iris Society. This prestigious award is reserved for those who contribute to the advance of the genus *Iris*. The plaque was instituted in 1926 in recognition of Sir Michael Foster's "achievements and assiduous efforts in collecting and hybridising irises."

Carol began working on *Iris* for her doctoral research when she first came to UC Berkeley in 1991. Since that time, she has published 19 scientific articles on *Iris* and many popular articles (approximately 1 per year).

Carol has written broadly about *Iris* and her articles discuss the systematics and morphology at the genus, subgenus/sectional/series, and species levels. She has also described a few new species.

An article that best illustrates much of her work is on *Iris* subgenus *Iris*. It is a phylogenetic paper based on several plastid markers:

Wilson, C.A. 2017. Resolving sectional relationships in subgenus *Iris*, the Eurasian bearded species. *Systematic Botany* **42**: 392–401. https://doi.org/10.1600/036364417X695970.

Carol continues to be an active Research Botanist at UC/JEPS and has a paper in press on *Iris* subgenus *Xiphium* that uses next-generation sequencing (NGS) data, which is her first phylogenetic paper using these markers. This work builds on an earlier study of Carol's that published the first plastome for *Iris* (and Iridaceae).

Jepson eFlora Revision 11

Revision 11 involves treatments that have changed taxonomically (e.g., taxa added or deleted) or nomenclaturally since Revision 10 of the Jepson *eFlora*. A summary of the changes incorporated in the *eFlora* is presented below.

ASTERACEAE:
- *Layia erubescens* added, as native
- *Pectis prostrata* added to key, as waif

CARYOPHYLLACEAE:
- *Minuartia californica* changed to *Sabulina californica*
- *Minuartia cismontana* changed to *Sabulina cismontana*
- *Minuartia decumbens* changed to *Sabulina decumbens*
- *Minuartia douglasii* changed to *Sabulina douglasii*
- *Minuartia howellii* changed to *Sabulina howellii*
- *Minuartia nuttallii* changed to *Sabulina nuttallii*
- *Minuartia nuttallii* var. *fragilis* changed to *Sabulina nuttallii* var. *fragilis*
- *Minuartia nuttallii* var. *gracilis* changed to *Sabulina nuttallii* var. *gracilis*
- *Minuartia nuttallii* var. *gregaria* changed to *Sabulina nuttallii* var. *gregaria*
- *Minuartia obtusiloba* removed (misapplied, not in CA), replaced by *Cherleria biflora*
- *Minuartia pusilla* changed to *Sabulina pusilla*
- *Minuartia rosei* changed to *Sabulina rosei*
- *Minuartia rubella* changed to *Sabulina rubella*
- *Minuartia stolonifera* changed to *Sabulina stolonifera*
- *Minuartia stricta* changed to *Sabulina stricta*, leaving no *Minuartia* in CA
- *Pseudostellaria jamesiana* changed to *Schizotechium jamesianum*
- *Pseudostellaria sierrae* changed to *Hartmaniella sierrae*, leaving no *Pseudostellaria* in CA
- *Silene armeria* changed to *Atocion armeria*
- *Silene campanulata* (an illegitimate name) changed to *Silene greenei*
- *Silene campanulata* subsp. *campanulata* changed to *Silene greenei* subsp. *angustifolia*
- *Silene campanulata* subsp. *glandulosa* changed to *Silene greenei* subsp. *greenei*
- *Silene coniflora* removed (misapplied, not in CA), replaced by *Silene multinervia*
- *Silene krantzii* added, as native
- *Silene nelsonii* added, as native
- *Silene pendula* removed (not in CA), a historical waif
- *Stellaria obtusa* changed to *Engellaria obtusa*
- *Vaccaria hispanica* changed to *Gypsophila vaccaria*, leaving no species of *Vaccaria*
- *Velezia rigida* changed to *Dianthus nudiflorus*, leaving no *Velezia* in CA

CHENOPODIACEAE:
- *Kochia americana* changed to *Neokochia americana*
- *Kochia californica* changed to *Neokochia californica*
- *Kochia scoparia* subsp. *scoparia* changed to *Bassia scoparia*, leaving no *Kochia* in CA

FABACEAE:
- *Acmispon heermannii* (a superfluous name) changed to *Acmispon tomentosus*
- *Acmispon heermannii* var. *heermannii* changed to *Acmispon tomentosus* var. *glabriusculus*
- *Acmispon heermannii* var. *orbicularis* changed to *Acmispon tomentosus* var. *tomentosus*
- *Acmispon nevadensis* (a superfluous name) changed to *Acmispon decumbens*
- *Acmispon nevadensis* var. *davidsonii* changed to *Acmispon decumbens* var. *davidsonii*
- *Acmispon nevadensis* var. *nevadensis* changed to *Acmispon decumbens* var. *decumbens*

OROBANCHACEAE:
- *Aphyllon franciscanum* added, as native

POLYGALACEAE:
- *Polygala acanthoclada* changed to *Rhinotropis acanthoclada*
- *Polygala californica* changed to *Rhinotropis californica*
- *Polygala cornuta* changed to *Rhinotropis cornuta*
- *Polygala cornuta* var. *cornuta* changed to *Rhinotropis cornuta* var. *cornuta*
- *Polygala cornuta* var. *fishiae* changed to *Rhinotropis cornuta* var. *fishiae*
- *Polygala heterorhyncha* changed to *Rhinotropis heterorhyncha*
- *Polygala intermontana* changed to *Rhinotropis intermontana*
- *Polygala subspinosa* changed to *Rhinotropis subspinosa*, leaving no *Polygala* in CA

Aphyllon fasciculatum – Photo by Neal Kramer

Layia erubescens – Photo by Susan Fawcett

Silene nelsonii – Photo by Steve Matson

Visitors to the Lichenarium

By Klara Scharnagl, Tucker Curator of Lichenology

What brings visitors to the lichen collection? With over 60,000 accessioned specimens, the Shirley Tucker Lichen Collection at the University Herbarium has a lot to explore!

I have enjoyed a number of visits over the past year, from friends, colleagues, artists, and researchers. Some visitors are simply excited to see what a lichen collection looks like, and to learn more about the lichen research and curation that I am engaged with day to day. The artists with whom I have collaborated were featured in a previous *Lichen Corner* in the *Jepson Globe*. Below I will highlight two other kinds of visitors; those interested in the curatorial aspect of the collection, and those interested in the research aspect of the collection.

Over the past year I have had two visits from folks interested in learning about lichen-specific curation best practices, from the University of California, Davis and from Cal Poly Humboldt. These visitors will take this knowledge back to their home institutions in order to improve or establish their own lichen collections.

One of the specimens, *Psora pacifica*, examined by Dr. Einar Timdal during his visit. Photo by Klara Scharnagl.

Klara & Einar: Dr. Klara Scharnagl and Dr. Einar Timdal looking through *Psora* specimens in the Lichenarium. Photo by Ann Evankow.

Dr. Einar Timdal studying and annotating specimens of Psora and related genera in the lichen collections at UC. Photo by Ann Evankow.

Curation of specimens is multifaceted, beginning with how each specimen is housed. My visitors and I discussed the use of boxes versus paper packets for lichens, and whether packets were organized upright in drawers, or lying flat in palm folders. There are pros and cons to each approach, but the important thing to keep in mind is maximizing the use of space while simultaneously minimizing any damage or disruption to the specimens. Once the specimens are properly housed, there is then the question of optimal organization. In many lichen collections, including our own, lichens are arranged alphabetically by genus, which is a better point of reference for lichens than arranging at the family level. As Lichen Curator, exploring and optimizing best practices for the curation of lichen specimens is an ongoing pursuit.

The main visitors to herbaria are researchers. As part of a UC Berkeley collaborative Peder Sather grant, two researchers from the University of Oslo in Norway visited the lichen collection in 2022. Dr. Einar Timdal and Ann Evankow visited the Herbarium in order to study the lichen genus *Psora* and related genera. They spent three days sorting through specimens from the collection, and then ran a *Psora* workshop at the joint meeting of the Northwest Lichenologists and the California Lichen Society. Studying specimens provides researchers with a lot of insights and data, but researchers also give back to the collections. Dr. Timdal provided multiple annotations to specimens in the collection, thus ensuring their correct identification and taxonomy.

Natural history collections are not static stacks of specimens inside metal cabinets. They are dynamic, constantly growing and changing, constantly building upon and providing knowledge. With each visit, the Lichenarium, its specimens and associated data, becomes enriched.

Video of Klara's Mini–Workshop Now Available

In 2022, Klara presented a Jepson mini-worksop *A big world in a small package: Lichen biology, identification and conservation*. The videos from that mini-workshop are now online on the YouTube page for the University and Jepson Herbaria.

Ramalina celastri. Photo by Stephen Sharnoff

Welcome to Saskia Raether!

I am a Museum Scientist working in the Silva Center for Phycological Documentation with Dr. Kathy Ann Miller and Dr. Richard L. Moe to curate the seaweed collection. As an undergraduate, I studied biology and Spanish at Gustavus Adolphus College in southern Minnesota, where I developed a passion for conservation biology and, most importantly, botany. Some of my fondest memories from my undergraduate studies are from a field trip to the Ozarks, where my plant systematics class identified, dried, and mounted many flowering plant specimens. I also conducted a study comparing prairie plant root length to non-native grasses to demonstrate the importance of native prairie plant root systems in preventing erosion. After graduation, I worked for the USGS to complete floristic surveys of restored prairies at the Glacial Ridge National Wildlife Refuge in northern Minnesota. Observing the change in phenology and the overall success of the conversion of farmland to restored grasslands further inspired me to study this ecosystem. Despite my interest in tall-grass prairie conservation, I decided to apply to Humboldt State University because of its renowned botany department. My formal training until that point was only in terrestrial vascular plants but I applied to study seaweed floristics out of sheer curiosity! And, as soon as my adviser Dr. Frank Shaughnessy introduced me to my first red seaweed (*Mazzaella splendens*), I knew I wanted to learn as much as I could about these amazing organisms.

For my master's thesis, I studied the marine algal communities in Humboldt Bay and how the structure of these communities changes along environmental gradients. I was lucky to have access to many types of intertidal communities to study , including muddy eelgrass beds, sandy shores, salt marshes, and rocky rip-rap. Through my field work, I identified microalgae, macroalgae, vascular plants, and sessile marine invertebrates, of which I mounted and digitized over 300 macroalgal voucher specimens. This work has been the most thorough ecological study of marine algal communities in Humboldt Bay ever done and I hope to publish this work with my advisor in the near future. In addition to my thesis, I curated and coordinated volunteers for the macroalgal herbarium at Cal Poly Humboldt, as well as worked at the Vascular Plant Herbarium to digitize and repair specimens. I also participated in a long-term monitoring project in collaboration with California SeaGrant tracking eelgrass (*Zostera marina*) populations in Humboldt Bay and assessing their ability to draw down excess carbon dioxide from the environment.

Saskia collecting cyanobacteria samples in Humboldt Bay for the phycology lab. Photo by Saskia.

Beyond my studies, I taught several classes at Cal Poly Humboldt, including phycology, general botany, and plant taxonomy. These courses invigorated my passion for botany and allowed me to research these topics at greater length to improve my fluency in botanical topics and my public speaking skills. Some of my favorite topics to teach were the theories of endosymbiosis throughout the algal groups, red algal reproductive strategies, eelgrass ecology, plasmodial slime molds, bryophytes (especially liverworts), the evolution of early vascular plants, mimicry and parasitism in angiosperms, and basically every family we studied in plant taxonomy!

Outside of academics, I enjoy wildflower photography, botanical illustration, plant dissections, and backpacking. My most recent trip to the Marble Mountains Wilderness afforded me the opportunity to find the beautiful *Lewisia cotyledon* and *Ribes marshallii*.

I am honored to now be working at the Silva Center at the University Herbarium where I can work with algal specimens from across California and the eastern Pacific coast. I am in awe of the size of the University and Jepson Herbaria, the scope of its outreach, the number of students and volunteers, and the amazing staff who have made me feel so welcome. My short-term goals are to give a seminar about my thesis work at a Botany Lunch and to host a seaweed workshop with Kathy Ann Miller. In the long-term, I would like to collaborate with other researchers on their publications, promote the seaweed collections, and be involved in algal and plant conservation work.

Want to Learn More About Marine Algae?

Check out the recordings from a recent mini-workshop presented by Kathy Ann Miller: *California Seaweeds: Seashores, kelp forests and climate change.* The videos are on the YouTube Channel for the University and Jepson Herbaria.

Eisenia arborea

Memorial & Honorific Gifts

In memory of Larry Abers
Britt Thorsnes

In memory of Clyde Calvin
Diane & Thomas Bland, David Born & Wesley Dubbs, Terry & Eileen Hanken, Chris Rooper, Carol Wilson, and Linda Lee Worlow

In memory of Lewis A Coveler
Alan Kaplan

In memory of Art Cupples
Janet Cupples

In honor of Dr. Lew Feldman
Ramona Davis

In memory of James C Hickman
Carole S Hickman

In memory of Robert M. Lloyd
Theodora Lee Gregg

In honor of Brent Mishler
Sheila Humphreys, Catherine M Rose, and Shasta Wildlife Conservation Foundation

In memory of Paul Mitchell
Susanne Haffner

In memory of Rod Park
Mary Beth Burnside

In honor of Alan R. Smith
Beth Alexander, Tom Lemieux

In memory of Isabel Tavares
Kathleen Dickey

In memory of Dean Taylor
John Stebbins

In honor of Yulan Tong
Phillip Reed

In memory of Frank Vasek
J. Giles Waines

In memory of David B. Wake
Marvalee Wake

In memory of John Weiler
John Stebbins

(Continued from page 1)

Monument. Dr. Heckard also played a critical role in the incipient rare plants program of the California Native Plant Society, which today has grown to be of key importance in conservation of California's rare native plants and which continues to interface closely with the Jepson Herbarium's floristic efforts.

Dr. Heckard's diverse and significant contributions to California plant systematics and taxonomy included detailed studies in *Phacelia* and the subtribe Castillejinae (*Castilleja* and relatives), along with many new-to-science taxa of Californian flowering plants that he first described as results of his extensive field, herbarium, and lab work. In Castillejinae, his major revisions of generic boundaries with long-time collaborator Tsan-Iang Chuang were upheld in recent years by the DNA-based phylogenetic studies by David Tank (now at Univ. of Wyoming). More generally, his studies of Castillejinae laid important foundations for work by Dr. Tank, his Ph.D. student Sarah Jacobs, now the Howell Chair of Western North American Botany at the California Academy of Sciences, Mark Egger (Univ. of Washington), and the Jepson Herbarium's Margriet Wetherwax. Dr. Heckard tackled difficult taxonomic problems that required attention to chromosomal and fine-scale morphological characteristics of the plants he studied, along with other aspects of their biology and natural history. His work was exemplary of the biosystematic approach in 20th Century botany.

Larry Heckard in the field, collection book in hand.

Dr. Heckard's legacy in California botany, like that of Dr. Jepson, has also endured through the major gift he left to the Jepson Herbarium in his will. For the past three decades, the Lawrence R. Heckard Endowment Fund has supported plant systematic and floristic research at UC Berkeley by dozens of graduate students, postdocs, staff, faculty, and research associates. That support has resulted in numerous published studies on Californian vascular plants, with special emphasis on investigations that advance the goals of the Jepson Flora Project, to elevate understanding and protection of our native flora. That support oftentimes has allowed for the acquisition of preliminary data in support of extramural grant proposals, and sometimes it has provided enough funding to allow for completion of smaller-scale but important projects. Taken together, many of the findings and refinements represented by revised treatments in the 2012 edition of *The Jepson Manual* and subsequently in the *Jepson eFlora* were made possible by the Heckard Fund. As Dr. Jepson noted, and as Dr. Heckard understood, published floras are works in progress, and will always need substantial revision as more is learned from careful study. Gifts like Dr. Heckard's are essential to ensure the means for advancing knowledge of our flora, in furtherance of its preservation.

Castilleja montigena (Heckard's paintbrush), a narrow endemic of the Transverse Ranges. Photo by Keir Morse.

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☐ ***Friends of the Jepson Herbarium*** *(U0840)*

☐ **Basic Membership ($45 individual, $60 family)**
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☐ **Sustaining Membership ($200)**
Receive basic membership benefits plus acknowledgment in the *Jepson eFlora*.

☐ **Lifetime Membership ($5,000 total, or pledge a minimum of $250/year)**
Demonstrate your dedication and commitment to the Jepson Herbarium with a lifetime membership. Gain recognition for your support in *The Jepson Globe* and the *Jepson eFlora*. Share your ideas with the Director and Curator at special, invitation-only events.

☐ ***Herbaria Futures Endowment*** *(14891)*
Support the infrastructure and care of the collections.

☐ I prefer to receive my copy of *The Jepson Globe* electronically (no paper copy).

☐ This gift is ___ in honor of, OR ___ in memory of:
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☐ My or my spouse's employer will match this gift. (Please enclose company form.)

☐ Please send me information about including the Herbarium in my will or estate plan.

Please make your check payable to the ***UC Berkeley Foundation****, charge your gift, or give online at: give.berkeley.edu/fund/?f=FU0840000*

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Thank you for supporting the Herbaria!

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ucjeps.berkeley.edu

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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* (Chaenactidieae, Compositae), and *Collinsia* (Plantaginaceae).

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Volunteer Opportunities at the University and Jepson Herbaria!

Photo by Isabella Ferreiro

Volunteering in the Herbaria is a great way to meet new people, gain new skills, and have fun! There are currently three types of volunteer opportunities that are available in the Herbaria. *ucjeps.berkeley.edu/main/volunteer.html*

WEEKDAY VOLUNTEERS (anytime between 9:00 a.m. and 4:00 p.m.)
Working with the Collections Management team, volunteers are engaged in a number of interesting projects including mounting, databasing, and sorting specimens. Please contact Ana Penny (apenny@berkeley.edu) for more details (510) 642-2465.

FRIDAY VOLUNTEERS (9:00 a.m. - noon)
The Cryptogam Volunteer program at UC/JEPS focuses on the lichen and bryophyte collections. If you are interested in learning more about lichens and bryophytes, this is a great opportunity for you, and no prior knowledge or experience is necessary! Volunteer tasks include preparing paper packets, gluing labels, adding barcodes, and repackaging specimens. Please email Dr. Klara Scharnagl (lichen_curator@berkeley.edu) for more details.

WEEKEND VOLUNTEERS (specific Saturdays, 10:00 a.m. - 4:00 p.m.)
One Saturday of each month is a Group Volunteer Day in the Herbaria. Our focus will be chipping away at the backlog of unmounted pressed plant collections, from California and around the world, some brand new, some decades old. Please contact Ana Penny (apenny@berkeley.edu) for more details (510) 642-2465.