

The
Matilija



The Newsletter of California Botanic Garden

Spring 2024



The *Matilija*

The Newsletter of
California Botanic Garden
Spring 2024
Volume 38, Number 1

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California Botanic Garden is dedicated to advancing knowledge, conservation, and appreciation of California Native Plants.

Welcome to the spring 2024 issue of *The Matilija*! On these pages, you will experience some of the remarkably diverse aspects of California Botanic Garden that are not obvious to the casual visitor.

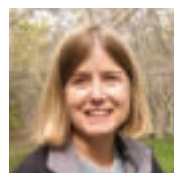
First, like many Gardens, CalBG's plants on the grounds are databased, mapped and monitored. What sets apart our Living Collection and makes it a highly valuable museum of plant diversity is that most of our plants are wild collected and of known provenance (i.e., we know exactly where the seeds or cuttings that gave rise to the plants now here on the grounds came from, who collected the plant material and when). This gives a great deal of value to our collection when it comes to documenting the characteristics of different plant species: one knows what one is dealing with. This is not the case when plants come from the horticultural trade or are exchanged, bartered or traded among those who fancy them.

You will also learn about our living conservation collections. If you have been reading *Matilija* for the last few years, you will have encountered an article or two about our amazing seed bank: THE California Seed Bank. Although most species of California native plants can be conventionally seed-banked (i.e., by cleaning, drying, and freezing), not all are so cooperative. Included in the uncooperative groups are some of our most iconic plants like oaks and walnuts. Stepping up to conserve genetic diversity of these plants, CalBG has been establishing living conservation groves, as described by Director of Horticulture Ashlee Armstrong. Make visiting one or more of these groves a regular part of your visits to CalBG. Select a plant that you especially admire and watch it grow; imagine how proud its 'mother' (i.e., the plant in nature that produced the seed that yielded our plant) would be. Join me in eagerly anticipating the leafing out of the plants in our newest conservation grove, California black walnuts!

And then there are the people! On these pages, you will meet a very special family who have made CalBG central to their children's education and general upbringing. CalBG has helped the parents teach them to appreciate nature, to revere it, to protect and to learn from it. The family inspires all Garden staff to do our part to make this Garden special in every way.

The young people sharing a year with us as participants in the National Science Foundation supported RaMP program illustrate several other ways in which this Garden supports the educational development of the next generation. You will see Erica and Marife in the nursery, in the molecular lab, working at the scanning electron microscope and off in the field gaining invaluable hands-on field experience. The projects they are working on during their RaMP year will advance knowledge of native plants while also greatly advancing their careers. We are proud to be part of this exciting program and look forward to welcoming the next pair of RaMP participants in late summer.

Did you know that all of this (and more!) is happening here at CalBG? And this is only the tip of the iceberg! Want to learn more? Explore our website while watching for opportunities for behind-the-scenes tours. Introduce yourself to a staff member the next time you are here and ask about the work they do. We love to share the multiple facets and levels of California Botanic Garden with our members and special friends.



Lucinda A. McDade

Lucinda A. McDade, Ph.D.

Executive Director

Judith B. Friend Director of Research

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Wild Collected

Conservation and Research
in the CalBG Living Collection

By Ashlee Armstrong and James Reed

Pseudognaphalium microcephalum (Wright's Cudweed) near the Forest Pavilion at CalBG.

When you walk through the California Botanic Garden, you are actually walking through a living museum. All of the plants on the grounds (except for the weeds!) make up the Living Collection, and detailed records are kept for each plant. You may notice metal dog tags that are visible on some of the plants from the pathways; these tags identify each plant by name, and by accession number. An accession number is akin to a plant's social security number and holds a wealth of associated data—where the plant was collected, who collected it, what the characteristics of the collection site were, and when and where it was planted in the Garden. All of this information is stored in a database that is managed by our Plant Records Manager, James Reed. A list of the plants that are currently in the Living Collection and a map of the Garden are available on our website.

The Living Collection holds over 1,100 taxa and 9,805 individual plants. These plants come from many different plant communities throughout the state, and from Northern Baja California, which shares our Mediterranean climate and is within the California floristic province.

The Garden is divided into three main areas: the Mesa, the SoCal Gardens, and the Plant Communities. While the Mesa and portions of the SoCal Gardens contain material that has been bought in and some cultivars (plants that are selected for, or in some cases, hybridized to produce a certain trait, e.g., flower color, growth habit, etc.), 68% of the plants in the Garden are wild collected and of known provenance. Wild-collected plants play an important role in conserving genetic diversity, and they are useful research subjects for the scientific community.

Research Projects Supported by the Living Collection

The Garden is not only a living museum, it is a living laboratory, used to advance the body of knowledge in a wide range of fields from botany to conservation to horticulture to ecology. The Plant Records Manager is frequently contacted by students and scientists with requests to utilize the Living Collection for their research projects. Read on to learn about three projects in which the Garden has recently, or is currently, participating.

Hybridization in Ex Situ Collections

The extent of hybridization (the flow of genetic material between two distinct species) in ex situ (away from the site where a species naturally occurs) collections is largely unknown. A multi-institutional project led by Dr. Sean Hoban of the Morton Arboretum, and funded by the Institute of Museum and Library Science, is assessing how often hybrids labeled as true species occur in ex situ collections. The focal species of this project, for our Garden, is the California Walnut (*Juglans* spp.). There are two naturally occurring species of walnut in California, and the Garden holds both in its Living Collection—the rare Southern California Black Walnut, *Juglans californica* and the Northern California Walnut, *Juglans hindsii*. Leaf samples from every *Juglans* plant that we have in the Garden, 47 Southern California Black Walnut and 18 Northern California Walnut, were collected and sent to The Huntington Library and Botanic Garden, where genomic data will be analyzed to detect hybrids from wild and cultivated individuals of these and other potentially hybridizing *Juglans* species. The purpose of the study is to help analyze the genetic diversity of living collections across institutions, and ultimately to inform decision making that will increase genetic diversity within botanic gardens.

Genetic Analysis of Rare San Diego Plants

The San Diego Zoo Wildlife Alliance team is focusing on genetic analysis of rare plants from San Diego County to better inform conservation management decisions. One of their target species is the endangered Torrey Pine, *Pinus torreyana*. Torrey Pines are the rarest pine trees in North America, the only populations existing along the coast in San Diego County and on Santa Rosa Island. The CalBG Living Collection holds four accessions of Torrey Pine from the San Diego populations. Pine needles of each accession will be submitted to the San Diego Zoo Wildlife Alliance for genetic analysis. The goal is to use this information to see whether wild genetics are well represented in ex situ collections, as well as to isolate individuals that might be important for future genetic rescue in ongoing conservation efforts. One interesting note about Torrey Pines is that while they typically reach only 25-30 feet tall and are gnarled and bent in their native habitat on windy, rocky coasts, in cultivation, they grow very straight and can reach over 100 feet tall!

Phylogenetic Studies of Asparagaceae

Cody Coyotee Howard, Assistant Professor at Oklahoma State University, and Philip Bentz, Graduate Student at



Collecting Asparagaceae samples from the Living Collection.

University of Georgia, are gathering samples for a project that focuses on establishing the relative placement of the subfamilies within the Asparagus family, Asparagaceae. They have contacted CalBG along with several other institutions in order to collect samples of 5% of species richness from each of the major subfamilies of the Asparagus Family: Asparagus, Agave, Bear Grass, Lomandra, Hyacinth, and Brodiaea. CalBG will be sending the researchers leaf samples of eight different species: two species from the Bear Grass subfamily, Parry's Nolina, *Nolina parryi*; and Dehesa Nolina, *Nolina interrata*; and six species in the Agave subfamily: Desert Agave, *Agave deserti*; Shaw's Agave, *Agave shawii*,

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Utah Agave, *Agave utahensis*; Joshua Tree, *Yucca brevifolia*; Mojave Yucca, *Yucca schidigera*; and Baja Candle, *Hesperoyucca peninsularis*. The researchers will conduct genetic analysis of these and many other samples to clarify the Asparagus family's taxonomic tree.

Growing the Living Collection

The Garden is always looking to improve the Living Collection. We have an ambitious goal to add 25 new wild-collected taxa each planting season, and to increase the percentage of wild-collected plants of known provenance within the collection to 70%. This season, we planted 20 new taxa, and added over 550 plants of wild origin. A few interesting additions this year include: *Pseudognaphalium microcephalum* (Wright's Cudweed), *Pyrracoma uniflora* var. *gossypina* (Bear Valley Pyrrocoma), and *Xylonagra arborea*.

Pseudognaphalium microcephalum, Wright's Cudweed, is a fairly widespread perennial that is distributed throughout the state in several plant communities. While the flowers are not particularly showy, they are great for pollinators, and the beautiful silvery foliage can be striking on its own. It is on display in several areas of the Garden, most prominently in front of the Open Vessel Statue, close to the southern end of the Forest Pavilion.

Pyrracoma uniflora var. *gossypina*, Bear Valley Pyrrocoma, is a rare plant that only occurs in the Big Bear area, and some of the few existing populations are threatened by housing developments in Big Bear Lake. The CalBG Seed Bank has two collections of Bear Valley Pyrrocoma, and seedlings from their germination trials, which seed banks conduct to test for seed viability, were transferred to the nursery to grow for the Living Collection. This summer, we hope you can find their yellow daisy-like flowers near the stand of Nodding Needle Grass (*Stipa cernua*) northeast of the Redwood Round on the mesa.

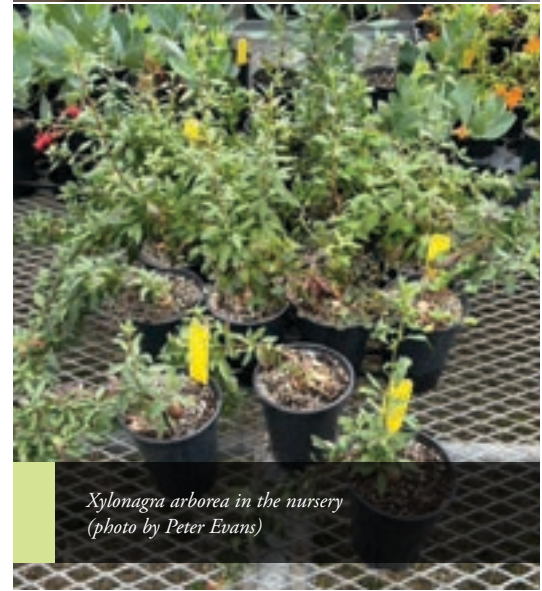
We received *Xylonagra arborea* (no common name) seed from Dr. Peter Raven of the Missouri Botanic Garden. Dr. Raven is conducting phylogenetic studies on the Onagraceae or Evening Primrose Family, and he hopes to use material from the plants we establish in our Living Collection for his research. *Xylonagra arborea* is endemic, or limited to, northern Baja California. It is a mounding shrub, with arching branches that are typically leafless. It has beautiful red flowers that we hope you will be able to see in the late springtime by the large Boojum, located at the northwestern end of the Plant Communities.

We hope you enjoy exploring CalBG's living museum, and watching the Living Collection grow. Not only is it a lovely place to walk, but it also serves as a tool for researchers, and as an important genetic repository of California's flora.

**It is important to note that unauthorized collection of plant material from the wild is prohibited, and CalBG has explicit written permission from landowners, whether that be a private landowner or a government agency, to make ethical collections of wild material.



Xylonagra arborea (photo by Peter Evans)



Xylonagra arborea in the nursery (photo by Peter Evans)



Pyrracoma uniflora var. *gossypina* (photo by Cheryl Birker)

Spring is for *Sponsors*

Join us as a sponsor and help California Botanic Garden bloom this spring! Sponsorship benefits CalBG programs and events, advancing knowledge, conservation, and appreciation of California native plants and the habitats that sustain them.

With nearly 100,000 visitors to the Garden each year, California Botanic Garden is one of Southern California's premier institutions to align with. Partnering with CalBG for engaging events and educational programs can raise brand awareness, reach key customers, and align your company or organization with a respected and celebrated Southern California institution. You will also gain the benefit of sustained visibility for your commitment to supporting environmental stewardship and enriching the quality of life in our community.



Scan the QR Code to view sponsorship opportunities and contact advancement@calbg.org for more information.



Save the Date
May 18, 2024
10 AM - 4 PM

California Botanic Garden and Sustainable Claremont present waterwise education, inspiration, and fun:

Free Garden Admission
Native Plant Landscaping Info
Exhibitors
Workshops & Panels
Live Music
Crafts & Storytime
Food & Drink
Raffle Prizes
and much more!

Conservation Groves at CalBG

By Ashlee Armstrong, Director of Horticulture



Quercus dumosa conservation grove at CalBG (2024)

Most seeds can be banked in freezers for long-term storage; however, some are recalcitrant and lose viability when subjected to the low humidity and freezing temperatures necessary for conventional seed banking. In order to preserve the genetic material of plants with recalcitrant seeds, the Garden has established conservation groves. There are two main criteria to establish a conservation grove: one, the target species' seeds are recalcitrant or exceptional (does not produce viable seed, or is very short-lived in a seed bank); and two, the target species is rare, threatened, or endangered. Conservation groves can be thought of as living seed banks, or in the case of oak trees, which have a high propensity for hybridization, a living germplasm bank. Target species are wild collected from individual seed-producing "mother" plants. This process is referred to as collecting along "maternal lines." Collecting seeds (and cuttings or other propagules) in this way ensures that the grove is representative of the diverse genetic makeup of the wild population.

Below are photographs that document our two most recent conservation groves: *Quercus dumosa* and *Juglans californica*.

Quercus dumosa, Nuttall's Scrub Oak, is a rare scrub oak that

occurs in San Diego, Orange, and Santa Barbara counties, usually within view of the ocean. Since humans also like to live within view of the ocean, development is the largest threat to this species. One hundred saplings were outplanted in the Garden in 2016 that are representative of 31 maternal lines across five populations in San Diego County.

Juglans californica, Southern California Black Walnut, is a vulnerable species that only occurs in the foothills of the Coastal, Peninsular, and Transverse Ranges of southern California. A century ago, forests of this species covered these areas for miles on end. However, urbanization, invasive species, and changing fire regimes have greatly reduced the tree's populations. Thirty-two *Juglans californica* were planted in 2022, representing 25 maternal lines across 5 populations in the greater LA area.

Both of these groves are located along the northeast portion of the "Loop Trail" in the Plant Communities.

The establishment of CalBG's conservation groves was supported by funding from an American Public Gardens Association tree gene conservation grant and executed in partnership with the members of SeedLA.

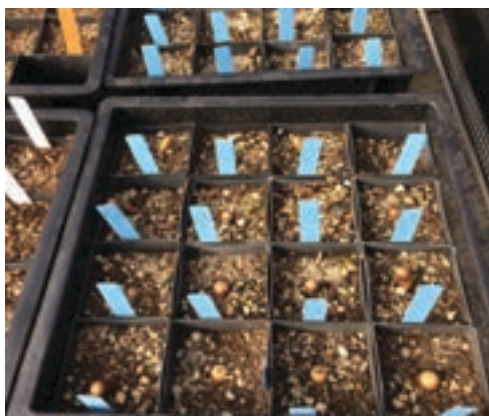


Quercus dumosa acorn (photo by Keir Morse)



Photo (above): The only *Quercus dumosa* var. *gabrielensis* currently in the CalBG Living Collection.

Our next conservation grove will consist of *Quercus dumosa* var. *gabrielensis*, a scrub oak that has a very limited distribution within the foothills of the Western Transverse Ranges and the San Gabriel Mountains. We have received funding from the American Public Garden Association and the National Forest Service to scout for and collect acorns for this species, which will eventually be grown out in the nursery, and outplanted in the Living Collection.



Quercus dumosa acorns in the nursery. Each acorn receives its own tag to ensure that the maternal lines are maintained.



Scouting trip for *Juglans californica* in the Santa Monica Mountains (photo by Naomi Fraga)



Scouting trip for *Juglans californica* in the Santa Monica Mountains (photo by Naomi Fraga)



Juglans californica fruit at a collection site in Puente Hills (photo by Naomi Fraga)

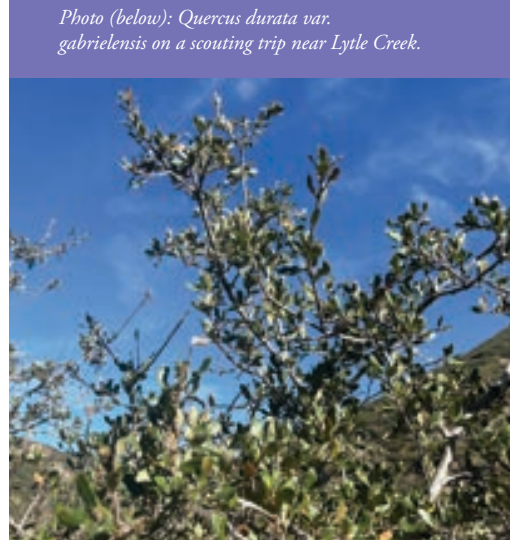


Photo (below): *Quercus dumosa* var. *gabrielensis* on a scouting trip near Lytle Creek.

Securing CalBG's Future, One Story at a Time

By Jessica Wetzel, Director of Advancement

From membership dues to tributes and memorial benches to donations of items and services, contributions from a diverse community of supporters secure the future of this Garden. The generosity of individuals, organizations and foundations enables us to nurture our Living Collection, advance critical research, and engage the public in the vital work of protecting native habitats.

For the Advancement Department, fundraising is more than just the pursuit of financial support: It is a collective endeavor that invites the CalBG community to become part of a shared story. Ours is a story of conservation, research, and appreciation of California's natural heritage. Just as each plant in our Living Collection tells a unique story of resilience and adaptation, each person that supports the garden brings an inspiring story of connection and purpose.

Garden Stories



Linda Prendergast

As we stroll the Native Designs Flower Garden, we think of Linda Prendergast. With a professional background in the nursery industry, Linda was gifted a membership to the garden in retirement.

This gift kicked off years of continued service as a volunteer, making flower arrangements for the Garden's entrepreneurial Native Designs floral business, and as an Advisory Council member. Linda, who says she is "in her element at California Botanic Garden," has since joined the Susanna Bixby Bryant Council, a legacy society for the people who have made provisions for the Garden in their estate plans.

Each time we sit on their bench in the California Plant Communities section of the Garden, we are reminded of Miko and Yuki Sasaki. They loved watching the wildflowers and



Coco and daughters, Juliana and Maya, sitting on Miko and Yuki's lovingly selected tribute bench.

cacti change through the seasons. The garden became a special place for three generations of their family. Their daughter, Coco, remembers being a young girl and bird-watching with her brother and parents at CalBG. Coco's daughters first learned to identify Manzanita trees and monarch butterflies while visiting the garden with their grandparents. The family's tribute bench to Miko and Yuki now provides a much-needed rest to visitors enjoying these garden delights.

Stories like these make the Garden stronger. They remind us that behind every dollar raised, there is a collective commitment to a more sustainable future for all. The Advancement Department extends our gratitude to all who contribute to the Garden's story. Everyone in this community plays a role in securing the Garden's future and maintaining its efforts to collect, cultivate, study, and display native plants. From one-time visitors to long-time members and donors, every contribution helps us maintain the strong foundation of support that keeps this vital work moving forward.

As we look ahead to projects like the new welcome plaza, improved pathways near the Tongva Village, and the expansion of our Herbarium, there are many ways to help CalBG write the next chapter.

Our Stories



Indra Chapman: Advancement Coordinator

Indra is brand new to the Advancement Office and is very happy to be here. Prior to arriving at CalBG, she worked at Perseverance Theatre in Juneau, Alaska and then studied religion at Claremont Graduate University. In her free time, she rides bikes, writes music, and cooks for her roommates.

Fun fact: She was in a train crash last summer! (no one was hurt)



Jen Pizzolo: Associate Director of Advancement

Jen has worked in the Advancement Office of CalBG for several years. Her primary focus has been raising the funds necessary for the Garden to achieve its mission of advancing the knowledge, conservation, and appreciation of California native plants. Prior to CalBG, Jen was a development professional for two organizations that focused on environmental conservation and sustainability. When not in her office, she enjoys hiking, performing Improv, and playing board games.

Fun fact: Jen grew up in New York but will graciously accept a California pizza or bagel.



Jessica Wetzels: Director of Advancement

Jessica recently joined the CalBG staff after many years of visiting and appreciating the Garden. Before her new role, she wore many hats in the nonprofit sector, developing programs and cultivating financial support for organizations close to her heart. When not working at the Garden, Jessica can be found camping, crafting, and soccer-momming.

Fun fact: She has a rescue cat named Chowder that plays fetch.



Be Part of CalBG's Story

- Give the gift of membership
- Dedicate a path paver
- Honor a loved one with a bench or a memorial gift
- Schedule a recurring donation
- Sponsor a garden event
- Donate to the entry plaza project
- Name California Botanic Garden in your estate plan or will

For more information or to share your stories of CalBG, contact advancement@calbg.org or call (909)625-8757 ext. 258

Member Spotlight:

Rosemary, Jeff, Kennedy and Skye Elder

The Elders' love for CalBG bloomed in 2017 with a fortuitous visit to the Butterfly Garden. The family was inspired and moved by the story of monarchs and their special relationship with milkweed. The Elders have since hatched and raised over 200 monarchs for release into local habitats. Kennedy and Skye lovingly steward caterpillars through their life cycles and prepare them for release, providing them with native milkweed from the Grow Native Nursery. Dedicated homeschoolers, Jeff and Rosemary bring their girls to the garden each Friday as part of the curriculum. These Fridays are all about encouraging Kennedy and Skye to slow down, observe, and appreciate. As a result, both girls are native plant enthusiasts, wildlife lovers, and fierce advocates for preserving and protecting local habitats.



What is your favorite thing about visiting the garden?

Skye: To witness the changes in the seasons! We like to look at the flowers, draw them in our nature journals and then see how they have changed when we come again.

Kennedy: I like to look for animals. We used to come check on an owl. We have seen coyotes and even a bobcat in a tree with her kitten. I always check on the ducks and turtles in the ponds.

🌸 *Kennedy's Favorite Native Plant: Matilija Poppy*

🌸 *Skye's Favorite Native Plant: Sky Lupine*

What tips do you have for people visiting the garden with children?

Skye: Make sure you bring a nature journal and colored pencils.

Kennedy: Leave no trace, so bring your trash out or throw it away. Also, bring a reusable water bottle.

Rosemary: Download the SEEK app by iNaturalist. We use it to identify plants along the trails and get more information about them for the girls.

Jeff: Keep on the trails. And find a quiet place to sit and listen to nature. If you're patient nature will come to you.

Which Garden activities or programs have you found particularly enjoyable?

Rosemary: Bump in the Night! This is one of the most thoughtful events for children around.



- Skye: I celebrated a birthday at the Acorn Festival.
- Kennedy: I like the Bird Festival. In the migration game they had in the Cultivar Garden, I was caught by a cat! People should leave their cats inside.
- Jeff: Luminara Nights! A great kickoff for the cold winter nights in December. We also appreciated the exclusive member reception.

Are there any aspects of the garden's mission or impact that resonate with you most?

- Rosemary: This is the largest garden dedicated to native plants and it is so close to home. The work that the garden does banking and preserving native seeds...all the field work; it is easy to overlook all of that and take for granted that this is right in our backyard.
- Jeff: The garden spreads across 86 acres and each area is dedicated to a section of California plants. The SoCal Gardens have every native plant you can find here. It is really something special.

Why is it important for children to visit and appreciate the garden?

- Rosemary: We need to create and foster a love for nature in children from a young age. I like to tell my girls we are borrowing the Earth from future

generations and we have a responsibility to protect it! The garden is a really good place to show the kids how we treat and protect natural spaces so that we can all enjoy it now and in the future. Coming here slows down the world in a time when everything is about screens and distractions.

- Kennedy: Sometimes I see kids throwing rocks or yelling and scaring animals. One time I was here watching the mallard ducks and the turtles and a kid scared them all away. The turtles went all the way down and I didn't see them again! Here, kids can learn to be more mindful in nature.
- Jeff: Great place for kids to learn about native plants and learn about how they change seasonally. Here, we really spend time together as a family and create core memories.

What is a hidden gem in the garden people should know about?

- Skye: The Boojum Tree!
- Kennedy: YES, The Boojum Tree and the trails by it. You can hike the trails for a long time and it feels very wild!
- Jeff: The Cultivar Garden, we've seen a bobcat in the huge trees. The swallowtails in the redwoods, it's really a magical experience.
- Rosemary: The Grow Native Nursery. Everyone that works there is wonderful. They are always offering their knowledge and sharing it with the girls so they have all the information about the plants and how to care for them. They are so kind and welcoming.

Is there something about the Family Plus level membership that you especially appreciate?

- Rosemary: We love the reusable guest pass that allows us to bring family and friends with us. The girls love to bring people around the garden, share what they know, and show them all of their favorite places.
- Jeff: This is our place, our backyard. Actually, my Grandmother even worked here! Her name was Cledith Rue and she worked as executive assistant under Dr. Lenz. We love it, and with the guest pass we get to show people why we come here.

Budding Botanists: Growing Careers with the RaMP Program

By Erica Fontanez and Marife Auccapoma

Thunder and lightning joined the torrential rain that started suddenly as we were collecting samples. One of the last things we expected from doing fieldwork in the desert was to get caught in a thunderstorm, but then we never thought we would be in the beautiful Ash Meadows National Wildlife Refuge, getting samples from rare, endangered plants for a research project with CalBG. This opportunity came about thanks to the RaMP program, or the Research and Mentoring for Post-Baccalaureates in Biological Sciences program. It is funded through the National Science Foundation and is aimed towards people with a bachelor's degree that have limited to no experience in botany research.

Getting into this program felt like winning the lottery for us; having recently finished undergrad at California State Polytechnic University, Pomona and having little relevant experience, the field of botany seemed inaccessible. In a funny coincidence, we took a biology class together (before we knew each other properly) with Dr. Edward Bobich, a CalBG research associate, but did not see each other again until our first day at CalBG. Now we both share an office, some plants, and the amazing opportunity to be part of the first RaMP cohort!

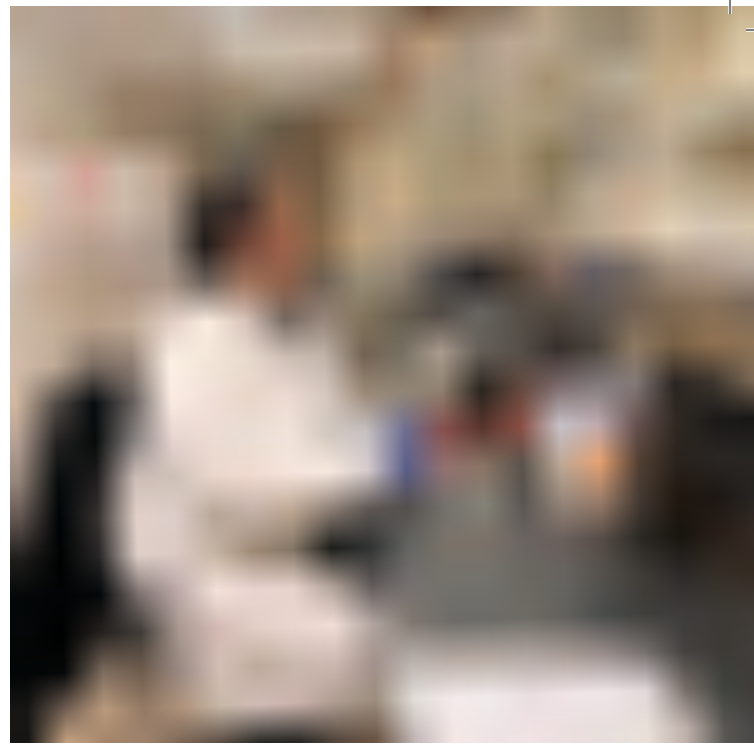
While we both were interested in botany, getting research experience was a challenge. Marife always had an interest in plants, in particular cultural and medicinal uses for them. Growing up in Peru, they remember walking around markets as a child and seeing herbal blends and plants promoted for their health benefits; to this day, they keep *Ormosia coccinea* seeds handy, for good luck. Marife is currently researching

species boundaries of *Zeltnera* including *Z. namophila* (Spring-Loving Centaury), which is endemic to Inyo County, CA. By conducting a phylogenetic and a population genomic study and examining micromorphology, they hope to differentiate *Z. namophila* from its relatives. The data obtained from this study will also help inform conservation efforts for this very special plant. In order to gather data necessary for this project, they have had the opportunity to gain experience in the molecular lab, herbarium, the seed bank, and the restoration nursery. Having the opportunity to become involved with the Garden has inspired them to pursue a master's degree and to seek ways to remain involved in research.

Erica has also always been drawn to plants. Before heading back to college, her hobbies included collecting house plants and frequenting nearby botanic gardens. During her undergraduate studies, she found a passion for genetics and decided to combine her hobby with her favorite science subject. Erica is now working on resolving the relationship between two populations of *Chloropyron tecopense*, more commonly known as Tecopa Bird's Beak. These two populations are about 150 miles apart in Fish Lake Valley and the Amargosa River Basin in Nevada and California. Researchers from CalBG have noticed that there are differences in size and in flowering time between the two populations. Since plants have plasticity (the ability to change in response to different environments) it is difficult to declare if these differences are due to plants responding to differences in their environments, or if they are two different subspecies. In order to resolve the relationship between these two populations, Erica will attempt to grow *C. tecopense* from seed from both populations in the CalBG nursery, and take

measurement data to compare the growth of both populations. Growing these plants will be quite the challenge, as *C. tecopense* grows in very unique marshland conditions that include high salinity, high pH, and the intense desert sun. In addition to these challenges, *C. tecopense* is a hemiparasitic plant and requires a host to collect nutrients. If grown successfully, it will be the first time this has been achieved in a nursery setting! Results from the common garden study and genetic comparison will support whether or not these two separate populations should be recognized as two different subspecies.

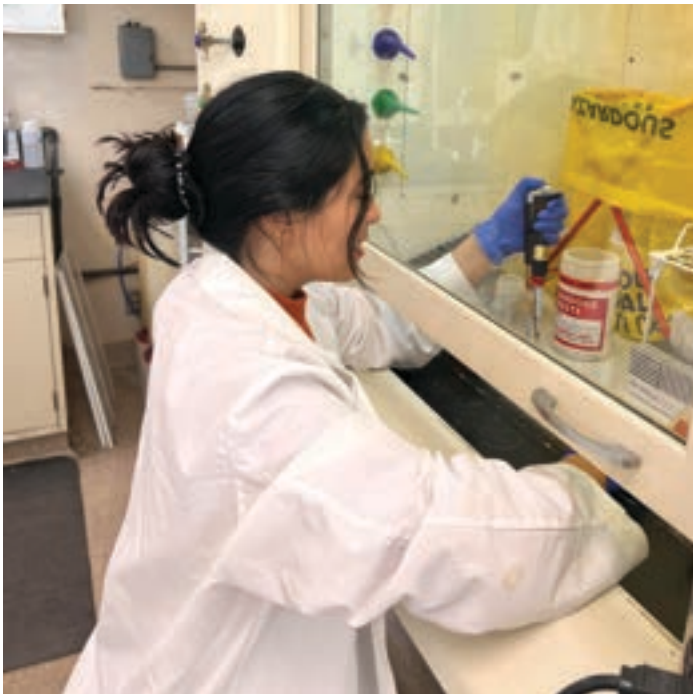
The RaMP program and working with all the talented, accomplished individuals at CalBG has given us research experience and a sense of belonging to this great scientific community. Erica is currently applying to master's programs in her field of interest, conservation genetics, while Marife is looking into getting more field experience, and is researching different master's programs to apply to next year.



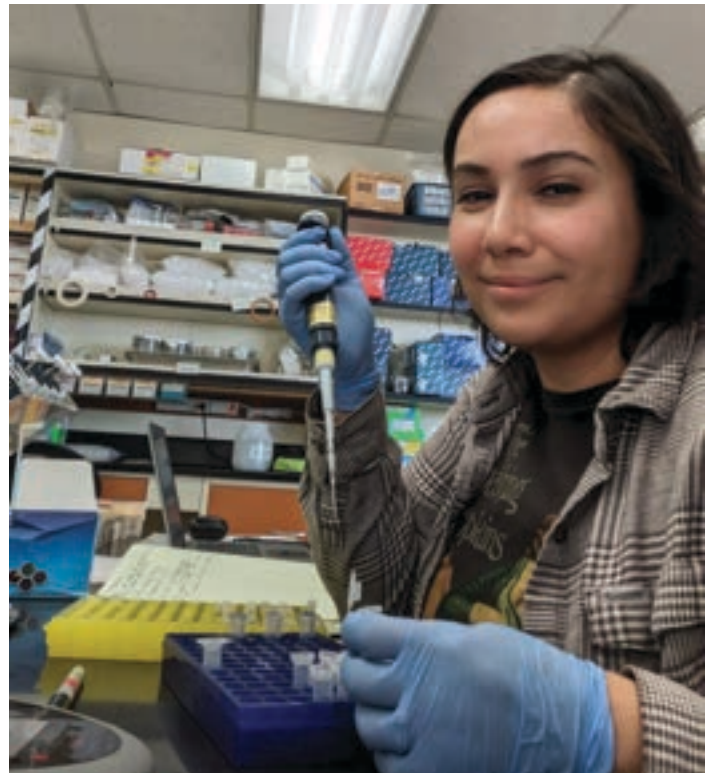
A Week in the Life

RaMP mentees are busy all week long at the Garden and in the field. Follow along with them as they research and explore:

Working in the Molecular Lab



*Marife pipetting in the lab. Since my study involves investigating the phylogenetics of *Z. namophila* and relatives, there's periods of time when I spend all day in the lab. The amount of work that goes into getting the data we need can be very humbling.*



Erica checking the concentration of DNA extractions

Working in the Anatomy Lab



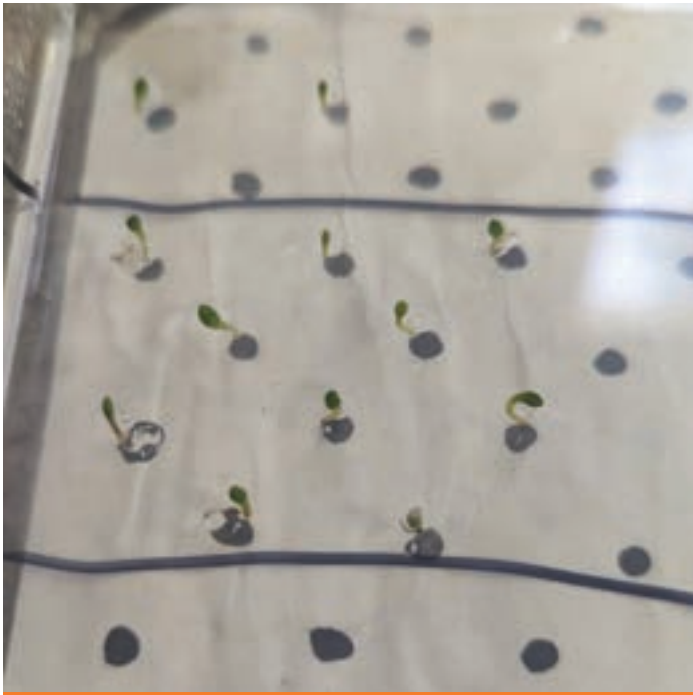
*Marife looking at *Justicia stigma* using the SEM. One of the most fun parts of working in the anatomy lab is getting to use the SEM (scanning electron microscope). Being able to observe the smallest structures with such detail really makes one admire the complexity of the organisms we study.*

Attending Classes and Seminars



Learning about plant classification in Dr. Lucinda McDade's systematics class. We are very lucky to be hosted by a botanic garden that offers a graduate program in Botany. Sitting in on classes offers additional opportunities for in-depth learning in a group setting.

Research in the Seed Bank and Herbarium



*Erica and the team at CalBG germinated some *C. tecopense* seeds in agar.*



*Taking some measurements of several *C. tecopense* to compare sizes between two populations. The work that takes place here really drives home the impact that research and conservation have in the long-term. Seed bank collections and Herbarium specimens will provide valuable data to researchers for decades to come.*

Working in the Production Nursery



*Marife trimming *Deinandra minthornii* (Santa susana tarplant). Helping out at the nursery by taking care of seedlings and juvenile plants makes me appreciate being part of the Garden's bigger effort of restoring native plant habitats.*



*Marife recently joined the restoration team in planting over 300 *Asclepias fascicularis* (Narrowleaf Milkweed) in the Angeles National Forest.*



*Erica works on transferring her *C. tecopense* germinants to soil with their host plant, *D. spicata* (salt grass). Hopefully they like their new home!*

In the Field



Exploring the Otay Mountains with fellow RaMP mentee Alison Snyder and RaMP mentor Rachel Sadowski from SDBG. Getting out and doing fieldwork is definitely a perk of working here. We get to see cool plants in person AND hike? Sign us up.



Finishing the afternoon with some 4x4 training

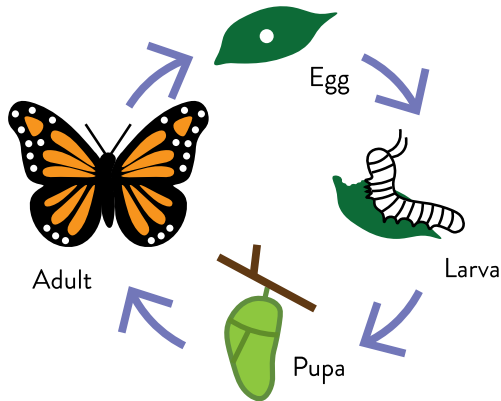


*Erica and Marife looking for suitable *Zeltnera namophila* (Spring-loving centaury) tissue to use for DNA extractions. This will be used in Marife's phylogenetic study.*

Curiosity Corner

CALIFORNIA NATIVE BUTTERFLIES

A Butterfly's Life Cycle



Can you find all the butterfly life stages in this word search?

L	A	W	B	T
C	A	V	P	L
E	G	R	A	U
G	L	T	V	D
G	P	U	P	A

Egg

The first stage of a butterfly's life begins as an egg laid by a female butterfly.

Larva

The second stage of a butterfly's life is when it becomes a caterpillar feeding on plants for nutrients.

Pupa

Once the caterpillar is full-grown, it becomes a cocoon known as a pupa or chrysalis.

Adult

The fourth and final stage is when the butterfly reaches full maturity. Soon, it may lay eggs of its own!

Butterflies & Host Plants

Some butterfly species rely on specific host plants to lay their eggs and provide nutrients for their larvae. Without these plants, the butterflies become threatened or endangered! Can you match the butterfly to its host plant?



I'm a **Monarch** butterfly; I rely on this narrow leaf plant...



I'm a **Pipevine Swallowtail**; I rely on this vine with funky-looking flowers...



I'm a **Mission Blue** butterfly; I rely on this purple flowering plant...



California Pipevine
(*Aristolochia californica*)



Silver Lupine
(*Lupinus albifrons*)

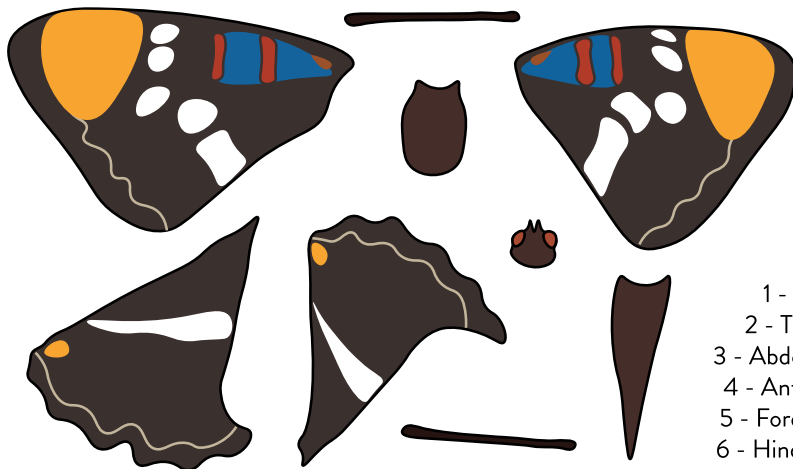


Narrow Leaf Milkweed
(*Asclepias fascicularis*)

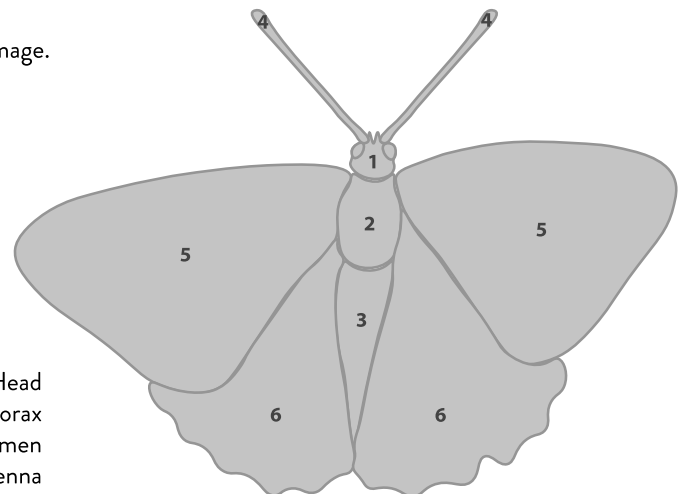
Answer: Monarch-Narrow Leaf Milkweed; Pipevine Swallowtail-California Pipevine; Mission Blue-Silver Lupine

Parts of a Butterfly

Cut the parts of the butterfly. Assemble and glue the pieces to the butterfly image.



- 1 - Head
- 2 - Thorax
- 3 - Abdomen
- 4 - Antenna
- 5 - Forewing
- 6 - Hindwing



California Sister (*Adelpha californica*)

Coming Up at CalBG

Spring and Summer bloom with fun and educational offerings at CalBG. Keep an eye on the Classes and Events page on our website for more information and tickets.

APRIL

Wildflower Month at CalBG

Wildflower tours, classes, and more all month long!

MAY

Waterwise Community Festival

Saturday, May 18, 2024

Celebrate biodiversity and learn about native plant gardening and watershed health at this fun, free event.

SUMMER IN THE GARDEN

Fluorescent Flowers

June-November

Sage Gallery exhibit featuring Craig Burrows' photos illuminating the hidden spectrum of native blooms.

Bird and Butterfly Garden Grand Opening

June 22 & 23, 2024

Join us all weekend long for a celebration of our newest garden space with classes, crafts, tours, exhibits, and a grand kickoff concert.

Cinema Botanica

July 27, 2024

An evening of films accompanied by native plant treats and drinks.

Garden Nerd Night

August 31, 2024

Plant themed games, trivia, cosplay, and more!

Member Mondays

Special members-only garden access and events all summer long!

ONGOING

Yoga in the Garden

Flow, stretch, and breathe, mornings, evenings, and weekends each month.

Art in the Garden

Monthly classes exploring creative and meditative visual interaction with nature.

Native Plant

Landscaping Classes

Your regular opportunity to learn about native plant gardening from the experts at CalBG.



Point your cell phone camera at the QR code to visit our website

Follow us on social media:



@californiabotanicgarden



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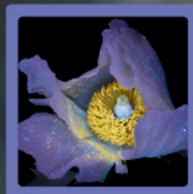
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Save the Date for
Summer in the Garden



Fluorescent
Flowers
Exhibit
June-October



Member
Mondays
June-August



Bird &
Butterfly
Garden
Celebration
June 22-23



Cinema
Botanica
Movie Night
July 27



Garden
Nerd
Night
August 31

More Info Coming Soon at www.calbg.org.