

# The Bulb Garden



~ Gardening with Bulbs ~

Volume 18, Issue 4

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## CAMASSIA in the North American Pacific Northwest

*Molly Carney is a recipient of the Mary Sue Ittner Bulb Grant to study Camassia use by Pacific Northwest Indigenous peoples. She is finishing her PhD at Washington State University this spring and will continue her work on Pacific Northwest geophytes as a Washington Research Foundation Postdoctoral Scholar. Preliminary results from this research are available at <https://doi.org/10.31235/osf.io/c752m>. Unless otherwise noted, all images are by the author. You can contact Molly at [mollyy.carney@wsu.edu](mailto:mollyy.carney@wsu.edu). Molly notes that she is a novice gardener; she began with vegetables and is working towards flowers with hope of expanding her bulb collection.*

As bulb enthusiasts, we have lively discussions within the pages of the *Bulb Garden* and online through the PBS listserv sharing the ways we care for our geophytes. I work as an archaeologist and through this experience have come to be equally interested in how people might have cared for bulbous and other geophyte species in the past.

In the North American Pacific Northwest, there are an extraordinary number of edible native bulbs, corms, rhizomes, and tubers that were essential parts of many Native American and First Nations' diets. These tribes have intricate knowledge on how these plants are used and consumed; however, some knowledge has still been lost over time. My research focuses on how bulbs, specifically camas bulbs (*Camassia* spp.), were used and cared for in the past.

The North American genus *Camassia*, taxonomically classified

in the Asparagaceae family, is comprised of five species with ranges across the United States and southern Canada. *Camassia quamash* (common camas) and *Camassia leichtlinii* (great camas) are the most widespread and familiar species across the Pacific Northwest. Both species are bulbous perennials with inflorescences of large, showy blue, purple or white flowers that grow abundantly in poorly drained fields or prairies. They are quite similar; great camas tends to grow taller and more stout than common camas with larger bulbs, and usually blooms a few weeks after common camas. All camas species usually take 4-5 years before they mature and produce seeds.

There are rich ethnobotanical and historical sources which describe the ways camas was used, prepared, consumed, and even managed by Native American and First Nations groups. While those of us who live in the Pacific Northwest know that salmon were among the most important food sources for the Indigenous groups of this region, it is less commonly known that camas was equal to or greater in dietary importance than salmon. Ethnohistoric sources indicate that bulbs are harvested in mid-summer; only mature bulbs which had gone to seed are collected. Today, people break

*Continued on page 3*

## JIM MCKENNEY— A Generous Plant-filled Life by Sally Bourrie and Chris Herbstritt

Jim McKenney died of COVID-19 complications on January 29, 2021, at age 77. As his sister, Maxine Kent, explains, “He had a variety of jobs throughout his life, but his career was really his garden.”

Jim graduated from the University of Maryland with a bachelor’s degree in Zoology, which was no surprise to his family. He’d always loved animals and the family home was filled with Jim’s pets, including a monkey, snakes, tegu and monitor lizards, an iguana, a boa constrictor, a Gila monster, and many more – including such pedestrian pets as a dog. Jim’s career at UMD displayed another trademark of his life: a passion for learning. He spent more than four years at UMD earning his degree because he took many additional horticulture classes as well as Sanskrit and German.

After graduating from college, Jim was drafted into the military. He was against the Vietnam War, but he proudly served the country as an army medic – stateside deferred due to his vision deficit.

Jim gardened at his family’s home on a quarter-acre plot in Rockville, MD, but eventually that was not enough space and he expanded into a sunny community garden plot. While Jim did have some areas of special interest – lilies and bulbs, for instance – his knowledge was encyclopedic and his desire to know more was never-ending. His brilliant mind was equal to his thirst for knowledge.

One of his close friends in Maryland, Chris Herbstritt, whose own love of plants allowed them to share not only the passion for plants but a sophisticated understanding of them, spoke of a visit to Jim’s garden, “chock full of unusual frits, Alliums, heirloom roses, irises, and lilies,” all well-grown and thriving. “The one plant that sticks in my mind,” writes Chris, “was a particularly nice form of red flowered *Lilium canadense*. They are often orange-red, but the form that he grew was brick red. It was so vigorous and well grown! Truly a sight to behold... He also grew a *Welwitschia mirabilis* from seed. Few botanical gardens even attempt to grow this plant. He grew it in a long cylindrical chimney pipe, because it had a long tap root. In case you didn't know, this is a rare monotypic gymnosperm from the Namib desert (Africa). I believe that its closest relative is Ephedra.”

Jim had an extensive botanical library, yet he said, “There are more important things in life than books.” And that attitude is equally a hallmark of his life. He was known for his gentleness, kindness and generosity that all shown as brightly as his sharp mind and extensive botanical knowledge. After his death, international testimonials uniformly described his sharing spirit, from his vast and highly specialized knowledge of botany to sharing plant samples and welcomes offered to those in the Washington, DC, metro area.

His regular articles and comments for the Pacific Bulb Society have been appreciated by all readers. Jim also spearheaded and wrote numerous articles for the Potomac Valley Chapter of the North American Rock Garden Society. His insights and photographs will be a valuable reference for current and future gardeners.

Jim’s blog, “My Virtual Maryland Garden,” which he began in 2007, can be found at: [My Virtual Maryland Garden](#). The site includes “Jim and his dog,” along with his self-described “Jim’s favorite things.” You can also find Jim on YouTube: <https://www.youtube.com/user/4caeruleus> Jim was preceded in death by his husband, Wayne Crist, with whom he shared 47 years. Jim will be buried with Wayne at the family plot in Bridgewater, Virginia.



*Lilium speciosum*. One of the many lilies Jim McKenney grew. Wikimedia Commons.



## **CAMASSIA cont'd**

off the seed capsules while they are digging the bulbs and replant the new seeds.

Camas bulbs are fascinating in that they contain large quantities of inulin, a complex carbohydrate, and must be prepared by steaming or roasting in underground earth ovens for 2-3 days to be safely consumed. Prepared bulbs are sweet, tasting somewhat similar to pumpkin. Bulbs can be pressed into cakes, dried, and stored. This food source was a popular commodity in the past and was widely traded, and many scientists hypothesize that plant propagules were intentionally moved and replanted throughout the region. Lewis and Clark noted that dried camas could even be consumed several years after it was prepared!

Many tribes and federal agencies today are interested in expanding camas habitats to increase access for Indigenous communities throughout the Northwest. While camas is still eaten during ceremonies and for special occasions, there simply isn't enough left to eat on a daily basis. This is where the scientists come in – we have assembled a team across several tribes, state and federal agencies, and universities to work together in getting more camas back on the landscape and onto plates. As part of this larger effort, we are working specifically to understand how camas was cared for in the past. People have been working with camas for thousands of years, and we can learn from those efforts to inform modern-day restoration and production.

Both the Pend Oreille valley in Washington state and the Willamette valley in Oregon are places where camas grew, and in some places, continue to grow profusely. These valleys also have yielded extensive archaeological collections of carbonized camas bulbs. Carbonization helps to preserve organic material for thousands of years, and the half-lives of carbon isotopes allow scientists to understand roughly when these organisms were last alive.

Carbonized camas bulbs from these valleys are frequently found in ancient earth ovens; many earth ovens were excavated in the 1980s through early 2000s prior to various construction projects throughout the regions. At the time, archaeologists dated some of those earth ovens and charred camas bulbs using radiocarbon dating and found that these bulbs came from earth ovens from as recent as the last few hundred years to as far back as 5,000 years ago, with one earth oven dating back to 8,000 years ago! The Mary Sue Ittner grant further helped our team to date two additional earth ovens, one each from the Pend

Oreille Valley and the Willamette Valley, to help fill in some chronologic gaps.

Over the past year, I visited the facilities where these archaeological bulbs are currently stored to learn more about how these plants were cared for over the past millennia. I measured almost 1,500 archaeological bulbs and recorded size dimensions as well as relative maturity at harvest. With all of this information as well as the radiocarbon dates, my team and I were able to conclude that for much of the past 3,500 years people in both valleys were only harvesting sexually mature bulbs, and, we infer, replanting the immature bulbs to ensure future harvests. We call this strategy of keeping only mature bulbs “selective harvesting,” as it allows the immature plants to continue to grow into future food sources. Even farther in the past before 3,500 years ago, it appears that people were pulling bulbs of all ages and maturities.

The only exception to this pattern is from the earth oven dated to 8,000 years ago, located in the Willamette Valley. These bulbs are both the largest and most mature of all the archaeological bulbs. It is possible that the pattern of selective harvesting started this far back in time, or that human population densities may have been so low that there was no need to carefully manage harvests to ensure future availability. Right now, however, we don't quite know why these bulbs are both the largest and most mature, though the team has plans to keep working and trying to understand the human decisions behind past plant management practices.

These results also support Native American and First Nations oral traditions and contemporary practices of plant food resource stewardship, extending ethnobotanical knowledge systems at least 3,500 years back into time. Our team is excited about these findings, and we have plans to adapt these results and the results of future studies to contemporary camas fields. This work is particularly important as many groups work to ensure sustainable food options for Native American and First Nations communities who seek to restore and reclaim their health, well-being, and cultural heritage.

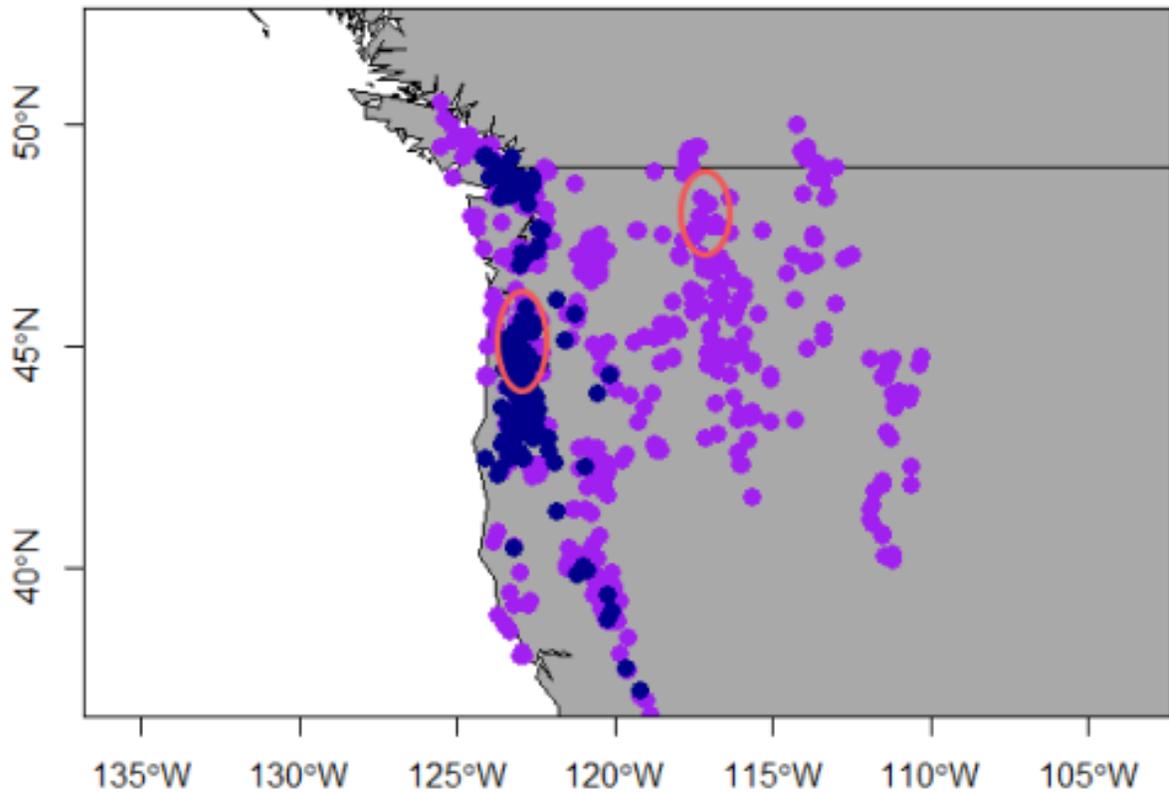
In the future, we have plans to explore other aspects of camas plant food production, preparation, and even expand test plots and fields to increase access throughout the Northwest. We still have many questions – did past peoples amend the soil in camas fields? When did people begin using fire to clear the fields? Do bulbs from coastal plots have different

**CAMASSIA *cont'd***

signatures than interior plots? We also hope to investigate the ways other geophytes with rich cultural histories may have been cared for in the past, with an overarching goal of reinvigorating traditional plant food consumption for the Indigenous groups of the Northwest.



*Camassia quamash*. One of the two commonest species of camas used for food in the Pacific Northwest. Photo: Robin Hansen.



Approximate distributions of *Camassia quamash* (purple) and *Camassia leichtlinii* (blue) throughout the North American Pacific Northwest. Map generated using data from the Global Biodiversity Information Facility database. Light red circles indicate the locations of the Willamette Valley near the Pacific Coast and the Pend Oreille Valley, located in inland Washington State.

**CAMASSIA cont'd**



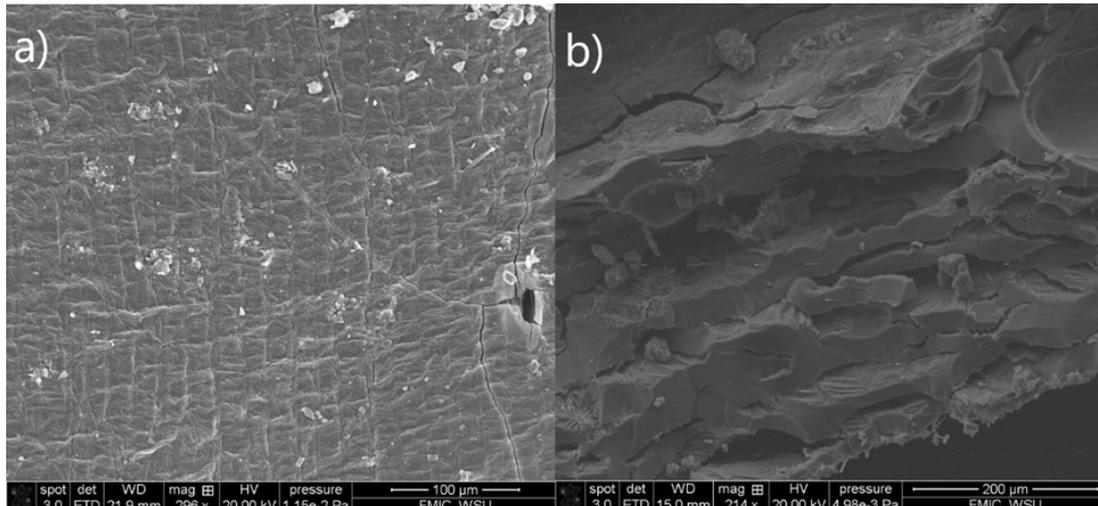
An archaeological camas earth oven in the Willamette Valley, excavated in 1996. Photo by Tom Connolly.



*Camassia leichtlinii* subsp. *suksdorfii*, the most common form of *C. leichtlinii* and one of the two commonly used species for food. Photo: Robin Hansen



Left: Charred common camas bulbs from a Pend Oreille Valley earth oven dated to 1828 to 1710 years before present. Photo by Cassidy Fairlane.



Scanning electron microscope images of archaeological common camas bulbs. Left image (a) shows epidermis, right image (b) illustrates heat-fused interior bulb leaf scales.

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## Camas species for gardens by Robin Hansen

Camas are one of the iconic bulbs of Northwest remnant prairies, fields and mountain meadows. Nothing to me says Pacific Northwest like the sighting of a camas in flower. Because of their long, narrow deciduous leaves, once out of flower they are not noticeable more than a few feet away from where they grow. Over the years of travel, especially up and down the Interstate 5 corridor from Salem, Oregon south to the lower end of the Umpqua Valley, I've learned where and when to expect to see them. Camas are not



*Camassia leichtlinii* subsp. *leichtlinii*.

tiny hidden plants when in flower, the multiple blooms usually being one to two inches in diameter on racemes of ten to 24 inches high.

Camas, both *Camassia quamash* and *C. leichtlinii*, were very important food sources for Indigenous peoples of the western U.S. and are still used ceremonially, baked and used as a source of bread or dried and stored for later use, the ancient equivalent of our freeze-dried meals. According to Dr. Carney, the tribes did not distinguish among the species or subspecies of camas.

*Camassia leichtlinii* subsp. *leichtlinii* has large creamy flowers with a hint of palest green; it is seen by many along Interstate 5 in small to larger patches in the Umpqua Valley beginning north of Sutherlin and continuing a bit past Roseburg. The Oregon Flora, Volume 1, says that this subspecies is seen at lower elevations in moist areas from the coast into the Coast Range while *C. leichtlinii* subsp. *suksdorfii*, with blue flowers is seen from the coast further inland into the Cascades. The most common Great Camas we see is probably *C. leichtlinii* subsp. *suksdorfii* or blue

great camas. *Camassia quamash* or common camas is an unexpected pleasure in high mountain meadows of the Cascades; I've seen them in Silver Falls State Park south of Silverton, Oregon and in very large, open higher-altitude meadows in the Ochoco Mountains south and east of Prineville, Oregon. On a hiking camping trip, this was a memory imprinted permanently; well, just to make sure I used a camera, because it's not a sight you want to forget!

Great camas has 4-8 leaves per bulb, is mostly noticeably taller than common camas having larger flowers with radially symmetrical corollas. Common camas is usually smaller, with smaller bulbs, 3-5 leaves and corollas generally arranged bilaterally. Fortunately, both of these species are readily available from specialist nurseries; but even these nurseries can have mix-ups occasionally. These bulbs are almost never available in your basic box store or even in most garden centers or nurseries.

My favorite small camas is more likely to be encountered in southern Oregon and eastward from the Cascades, also in most western states; it is *Camassia quamash* subsp. *brevifolia*. It has been a bit more difficult to grow, perhaps due to more moisture or poorer drainage than it would like, but for me stays quite short in pots in full



*Camassia quamash* subsp. *brevifolia*. Both photos: Robin Hansen

sun, with racemes of densely positioned, light to medium lavender blue flowers of good size. This camas would fit in an area of rock garden with the right requirements very nicely.

Every year I try to visit my favorite field of camas several times, first of all, to make sure nothing has happened to it, also to photograph it

## Camas species *cont'd*

and to continue my attempts to identify which species or subspecies of camas it is; the field is slightly sloping north and west above the highway and dries out by late June, a typical winter and spring-wet, summer-dry site in full sun. At the west end of this patch are a few scattered showy creamy white-flowered bulbs known as *Toxicoscordion fremontii* (syn. *Zigadenus fremontii*) or death camas, which is not even in the same family as camas. This year, at least, the death camas had begun blooming before the blue camas I have yet to identify; the death camas still has a few flowers while the camas has gone over and within two weeks will have ripe seed.

Those familiar with both camas and the several species of death camas, they won't be confused nor eat them, thinking they're camas - if they're paying attention to the details. Consuming the genus *Toxicoscordion* is likely to be a memorable experience, if you survive it, as the steroidal alkaloids in the plants and bulbs are toxic. The lesson in this case is never to eat any plant you can't positively and assuredly identify. A single doubt ignored may result in an irreversible and permanent view of the landscape.

In the garden, camas do not need the soggy, boggy conditions where you see them in the wild. Heavier soils are typical and welcome, not old dune sand unless it stays wet well into spring. As long as you have good moisture through winter and into spring, you will have a glorious show. Be sure to plant at least three or more bulbs spaced a few inches apart. If happy, they'll easily set seed and within a few years you'll have a nice patch of your own with enough seed left to donate to seed exchanges. The seed pods mature to a light brown and become papery; the pods and the shiny black seeds are both large enough for easy handling. Picking the seed just as the pods turn from light green to tan and storing them in a paper bag for a few days to dry out makes seed cleaning easy. Sow seeds 1/4-inch deep and leave outside for the winter.

Camas bulbs also grow well in sun in gallon or larger pots, provided they are kept watered through winter and into June; they gradually go dormant in summer. Replant every year or two and replenish with a fertilizer such as bone meal. As with many if not most native plants, never use more than a rate of half the recommended fertilizer.

<sup>1</sup>Personal communication, Dr. Carney, May 13, 2021.



## Mary Sue Ittner Bulb Grant Awards

The Board of the Pacific Bulb Society is pleased to announce that they have awarded Mary Sue Ittner Bulb grants to three recipients this year. All are, as a requirement for qualification, researchers focused on studying various aspects of bulbs, their cytology, reproduction, classification or related concerns. As a condition of these grants, recipients are required to write an article describing their research covered by the grants, and these appear from time to time in *The Bulb Garden*.

**1. Professor Guadalupe Munguia Lino** is a faculty member in the Department of Botany and Zoology at the University of Guadalajara, Jalisco, Mexico; she has been studying Tigridieae, with its center of diversification in the mountains of Mexico, and comprising some 73 species, 64 of which are concentrated within the states of Jalisco, Mexico, Michoacán and Oaxaca.



*Tigridia durangense*. Photo: Rogan Roth, from the PBS

Professor Munguia Lino has so far addressed the origin, diversification and geographical distribution of this group of plants and will use the PBS grant to obtain geographic data from a review of specimens from Herbario Nacional del Instituto de Biología, Universidad Nacional Autónoma de México and Herbaria of the Centro Interdisciplinario de Investigación para el Desarrollo Integral Regional, Instituto Politécnico Nacional. Field explorations will be conducted in the summer of 2021 in order to collect botanical specimens and tissues for DNA extraction, observe species in habitat, analyze floral structures, obtain photographs and record phenology. Collec-

## Mary Sue Ittner Bulb Grant Awards *cont'd*

tions will be made in Durango and Jalisco, Mexico. Live plants, bulbs and seeds will be obtained and these will be cultivated in the Jardín Botánico Didáctico of the Instituto de Botánica, Centro Universitario de Ciencias Biológicas y Agropecuarias of the University of Guadalajara, Jalisco, Mexico.

Professor Munguia Lino is also receiving support from the Consejo Nacional de Ciencia y Tecnológica and the Universidad de Guadalajara, through the Programa de Apoyo a los Miembros del Sistema Nacional de Investigadores y Sistema Nacional de Creadores de Arte.

As a showy, brightly colored collection of bulbs that PBS members have shown great interest in, support for such studies of *Tigridia* are integral to better understand and grow them.



*Globba winitii*. Photo: Wikimedia Commons. Native to Thailand.

**2. Ms. Ritu Yadav** is in the third year of her PhD program as a student of plant taxonomy and systematics at the Tropical Ecology & Evolution Lab in the Indian Institute of Science Education and Research, Bhopal, India. She focused on phenotypic plasticity and how it results in taxonomic complexes for her masters degree and is now working to resolve taxonomic problems using an integrative method that will include molecular as well as morphological tools to focus on species of gingers, especially from the genus

*Globba*. This focus on *Globba* will combine phylogeny and ecology to study the evolution of bulbils and their adaptive significance in this genus. *Globba* L. is the fourth largest genus in the ginger family (Zingiberaceae) and is one of three genera in the tribe Globbeae. Linnaeus established *Globba* in 1771 and the genus comprises at least 100 species distributed in Sri Lanka, India, Southeast Asia and Australia. In India, it is represented by 14 species confined only to a few states in the Western Ghats and North East India.

Most if not all *Globba* can reproduce both sexually (flowers that show andromonoecy and hermaphroditism) and asexually by rhizomes and bulbils. Bulbils are rare in tropical and subtropical plants, but *Globba* is unusual in being a tropical species that invests heavily in vegetative reproduction by means of bulbils, of which very little is known. However, bulbils are a very important character and are routinely used to identify many species. Ms. Yadav will focus on phylogenetic reconstruction of the genus *Globba* in an attempt to answer whether bulbils originated once, suggesting a single mutation event, or did they originate multiple times, suggesting parallel evolution; and do taxa with bulbils show better dispersal abilities as well as larger population sizes when compared to taxa without bulbils?

Having previously identified twenty-five locations of *Globba* species, this field season will feature collections in areas of West Bengal, Sikkim, Meghalaya, Manipur, Mizoram and Nagaland.

Judging by discussions on the PBS list, gingers are not widely grown. Given that many members grow tropical and subtropical bulbs, adding gingers which are rhizomatous perennials to their repertoire, especially with their heavily fragrant flowers, will certainly broaden the genera so many members grow.

**3. Analia Cecilia Gianini Aquino** is enrolled in the Programa de Estudios Florísticos y Genética Vegetal of the Instituto de Biología Subtropical, Posadas, Misiones, Argentina. Her doctoral project involves research activities that aim to study the relationship between modes of reproduction and levels of ploidy in native *Habranthus* species, many of which grow in Argentina, with a population focus which will generate valuable knowledge in order to make evolutionary hy-

## PBS Board Meeting—Minutes, February 28, 2021

Meeting began at 12:10 p.m. PST.

**Roll call:** Robin Hansen, Arnold Trachtenberg, Jane McGary, Johannes (Uli) Urban, Luminita Vollmer, Kathy Andersen, Martin Bohnet, Lee Poulsen  
**Guest:** David Pilling, PBS Webmaster.

**Minutes:** Minutes of November 2020 - Trachtenberg moved, seconded by Vollmer to approve minutes as presented. Motion approved.

**Treasurer's Report:** Trachtenberg had previously sent out a summary of PBS financial status. He has renewed the Pacific Bulb Society domain name for the website for three years. Half the printing costs for the *Hippeastrum* book have been paid to the printer. The paperback book is on 70 lb. coated stock with 144 pages. Trachtenberg also indicated that 60 members have prepaid for a copy of the *Amaryllis* field guide, and estimated PBS will make about \$10 a book. He has ordered shipping supplies.

### Committee Reports:

**US Exchange:** Vollmer reported that she has leftover seed ready for the next distribution. She keeps stats for each exchange and had 85 requests for the last exchange. About 30% requested all items listed. Discussion followed regarding distribution of requests for large amounts of seed. Requests are prioritized and those requesting large amounts, particularly for seeds donated in small amounts, are apportioned accordingly.

**EU Exchange:** Bohnet indicated they had 23 requests for their EU exchange. He also has established methods for distributing seeds. Urban said he had missed publicity for last fall's Mediterranean Bulb Society newsletter but publicity in Germany went very well. Bohnet said there is large concern about shipping requests to the UK due to Brexit and the pandemic.

**Membership:** McGary said renewals are steady and there have been an unusual number of new members lately. She did not have current numbers. Trachtenberg has sent out dues reminder postcards.

**Webmaster:** Pilling said that adjustments to the PBS wiki allow access from smart phones but that the archives and the website will require more complex work. When the *Hippeastrum* book eventually becomes available for download, a PDF of 14 mgb will be simple; there is setup required to make that available which will take time.

**Bulb Journal:** The new edition is at the printer's and will be 16 pages on Colchicums by the Russian

author Zubov. Hansen said she has enough articles for the next edition.

### Old Business:

**Update on Mauro Peixoto seed collection:** Poulsen reported receiving the newest list of offerings and was intending to send off our order today; he will send a copy of the order to Vollmer. The order will go directly to Vollmer for inclusion in the PBS exchange. Discussion ensued regarding storage of seed. Those involved in the exchanges store seeds in crisper drawers of refrigerators, making use of sealed plastic or glass containers and silica gel packets. McGary reminded us that germination inhibitors of some seeds wear off after several years.

**Board Liability Policy:** Trachtenberg has purchased a policy.

**New Business:** Grant applications are due March 30 and there have been inquiries.

Requests for permission to reprint photos from website. Following discussion, Pilling recommended not changing the current process which usually works, and said often photographers cannot be found or have passed away. However Bohnet suggested making sure if desired that photographers indicate "no commercial use".

Meeting adjourned at 1:25 p.m. PST.

Respectfully submitted,  
 Robin Hansen (substituting for Kathy Anderson)



### ANNOUNCEMENT!

The Pacific Bulb Society is pleased to announce publication of The Genus *Hippeastrum* (Amaryllidaceae) in Bolivia

As part of the Society's commitment to its members and to the public, and after nearly four years' effort, it is with great pleasure that the Society now has available copies of The Genus *Hippeastrum* in Bolivia. Please see also the ad on the back page of The Bulb Garden. Publications Director Arnold Trachtenberg is in charge of shipping the books, and payment can be made easily through PayPal. Arnold can provide details by emailing him at

[hippie.book@aol.com](mailto:hippie.book@aol.com)

## Mary Sue Ittner Bulb Grant Awards *cont'd*

potheses of the genus, as well as to obtain information for plant breeding and conservation strategies.

*Habranthus* species (rain lilies) have a complex evolutionary history and many taxonomic problems but are, however, of great interest for their ornamental and phytochemical properties. In characterizing the genetic systems of some species native to Argentina, the ability to understand evolutionary relationships would allow formulation of hypotheses and generate concrete tools for conservation and plant breeding.

Populations of *Habranthus* detected were small or reduced, preventing a large number of bulbs from being available, so Ms. Aquino has investigated geographical distribution, morphology, cytogenetics, mode of reproduction, breed production of these rain lilies. These investigations have sought to describe the processes of megasporogenesis and megagametogenesis from the analysis of embryo sacs, but these processes occur in the flower buds inside the bulb, requiring cutting into a large number of bulbs to obtain the embryo sacs. Because of this situation, it is important to investigate the processes

related to propagation of these bulbs. Fortunately it has been observed under different conditions that, in general, the species of the genus *Habranthus* produce a good number of seeds. (Ultimately this will benefit more than just scien-

tific endeavors; it will benefit growers and gardeners as well.)

Because of the need to produce bulbs for research, and because they produce from seed, evaluation of propagation through seeds could

mean seed propagation will become a simple and cheap method of obtaining plants and provide biological material to contribute towards future research.



***Habranthus tubispathus*. Photos: Nhu Nguyen.** Widespread species that occurs in the states surrounding the Gulf of Mexico, the Caribbean, disjunct in Central America and appearing again in South America. The variety *texensis* is found in Texas and Louisiana and is yellow-orange with streaks of bronze (from PBS Wiki).



## Saunders' Field Guide to Gladioli

Saunders' Field Guide to **GLADIOLI** of South Africa by Rod and Rachel Saunders

### THE BOOK

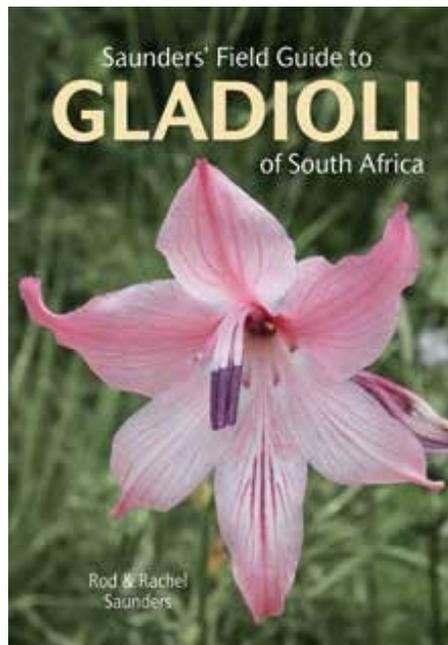
The genus *Gladiolus* has fascinated plant collectors, taxonomists and the general public for centuries. Known for their spectacular flowers, these highly adapted and specialized plants occur throughout Africa, Madagascar, Europe and the Middle East. South Africa is home to more than half of the world's *Gladiolus* species and the Western Cape is the heart of species diversity. **Saunders' Field Guide to Gladioli of South Africa** is the first of its kind to offer a complete photographic record of the 166 species that occur in the region. Posthumously completed by Fiona Ross, this book is the culmination of the Saunders' long search to find and photograph every known species of *Gladiolus* in South Africa. It includes:

- An introduction comprising a brief history of gladioli, information about the morphology and taxonomy of the genus, and guidelines for use in the field.
- Detailed descriptions of the main floral parts of each species, along with information about ecology, pollinators, similar species and conservation status; field notes were written by Rachel Saunders.
- Over 1,000 exquisite photographs taken in situ detailing morphology and habitat.
- Up-to-date distribution maps indicating where species have been recorded.
- A glossary of terms with illustrations unpacking difficult terminology.

### THE AUTHORS

Rod and Rachel Saunders travelled and hiked widely in search of seed for their company, Silverhill Seeds, and were also partners in a micropropagation enterprise. Internationally respected for their knowledge of South Africa's indigenous plants, their passion for bulbs led them into this project. Tragically, their work on the book was cut short when they were abducted and murdered during a field trip in 2018.

*Fiona C. Ross is Professor of Anthropology at the University of Cape Town. She established the Saunders Guide Trust to secure the Saunders' work on gladioli and to complete the guide that they had begun before their deaths.*



This book is expected to be available in August and will be available through PBS. An announcement will be made as soon as arrangements are made with the publisher. *Editor.*

## NEW PBS BOARD MEMBER

Kathy Anderson, long-time secretary on the board of the Pacific Bulb Society has recently resigned due to illness. We are grateful for her long dedication to the PBS Board and will miss her deep experience, her historical knowledge of PBS and her willingness to volunteer her time, not to mention her love of bulbs.

M. Gastil-Buhl, known to all as Gastil, has volunteered to fill Kathy's position and has been appointed by the PBS Board. Gastil gardens in Santa Barbara near the University of California Santa Barbara campus where she received her bachelor's degree in 1984. Since 1991 she has worked as a data analyst, and more recently as a data archivist. She will be retiring at the end of June.

In 2009 she discovered Telos Rare Bulbs which led her to find PBS. She has also previously edited the PBS wiki. Gastil mostly grows summer-dormant species from seed, especially those from the Cape of South Africa, with much of her collection

coming from PBS seed exchanges. She has focused on growing only blue or near blue colored flowers.



*Geissorhiza aspera*. Photo by M. Gastil-Buhl. One of the many blue South Africans she grows.

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