

THE BULB GARDEN

The Newsletter of the Pacific Bulb Society

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THE MEXICAN LIRIOS

(GENUS ALOPHIA)

Guadalupe Munguía Lino

Mexican lirios (in the genus *Alophia*) belong to the tribe Tigridieae (Iridaceae). This tribe contains 203 species of geophytes. These plants have bulbs, plicate and bilateral leaves, an inflorescence arranged as a rhipidium, and two series of three tepals, and style 3-branched. The floral morphology contrasts with the vegetal uniformity. The majority of morphological characters are in the reproductive structures (Rodríguez y Sytsma 2006, Munguía-Lino *et al.* 2017). The morphology of these structures is the result of pollinators interaction (Goldblatt *et al.* 2008, Goldblatt & Manning 2008). Based on DNA sequences, the tribe Tigridieae has been divided into two natural groups (clade A and clade B; Chauveau *et al.* 2012). The genus *Alophia* belongs to the clade B with *Cardenanthus*, *Cobana*, *Eleutherine*, *Ennealophus*, *Gelasine*, *Hesperoxiphion*, *Mastygostyla*, *Phalocallis* and *Tigridia* (including *Cardiostigma*, *Colima*,

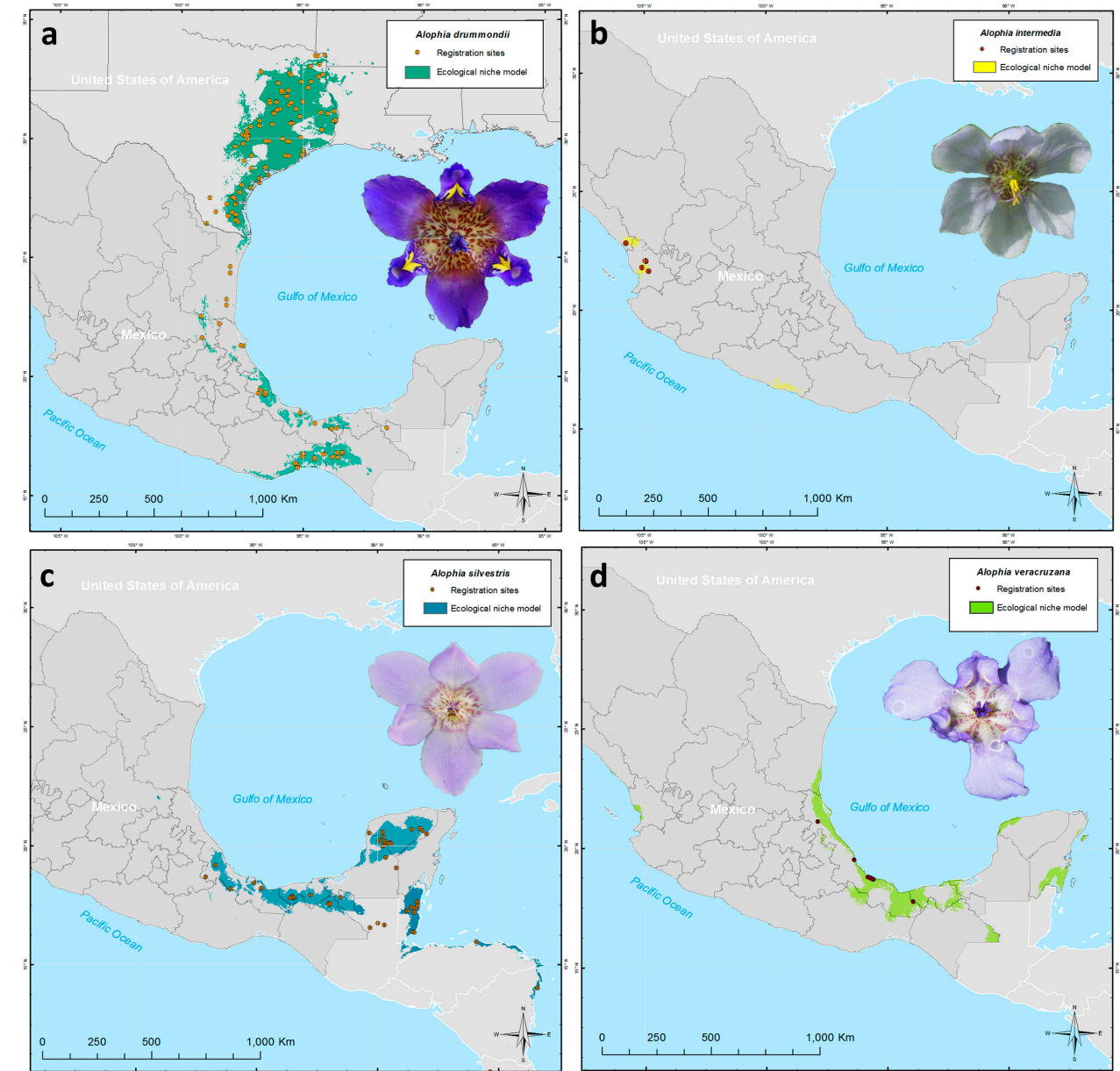
Fosteria, *Sessilanthera*, and *Rigidella*; Munguía-Lino 2016, Chauveau *et al.* 2012). *Alophia* includes six species, *A. drummondii*, *A. graniticola*, *A. intermedia*, *A. medusa*, *A. silvestris*, and *A. veracruzana* (Gil *et al.* 2021). These species are characterized by the presence of membranous bracts. Their tepals are white, lilac, purple or blue, sometimes the inner tepals have scattered oil glands on the lower half, partially covered by a fold. The filaments are free or partially connected. The anthers are pandurate (fiddle-shaped) with a broad connective. Sometimes they are attached to the style by sticky mucilage. The style is divided into three branches; each branch is subdivided into two filiform arms at or above the anther level. The fruit is a capsule with angular seeds (Goldblatt & Howard 1992, Goldblatt & Manning 2008; **Figure 1**).

Alophia is an endemic American genus, distributed from Goiás in Brazil to Texas in the United States of America. Mexico is the country with the greatest diversity, with four species growing in its territory; two of them are endemic (**Figure 2**). *Alophia drummondii* grows throughout the Gulf of Mexico biogeographic province in the United



LEFT: Fig 1, *Alophia* flowers and seeds

BELOW: Fig 2, Species distribution maps



States of America and Mexico (**Figure 2a**). *Alophia silvestris* grows along the Yucatan Peninsula and Veracruz in Mexico, but also extends into Belize, Guatemala, Honduras and Costa Rica (**Figure 2b**). *Alophia veracruzana* is endemic to the state of Veracruz (**Figure 2c**). In contrast, *Alophia intermedia* has distribution that is disjunct to the rest of *Alophia*. It is endemic to Sinaloa and Nayarit on the Pacific coast (**Figure 2d**). Geological events and climate have been responsible for the evolutionary history of *Alophia* in Mexico, the group has diversified in warm climates. Actually, we are studying the biogeographic history of *Alophia*. I used this grant to conduct fieldwork in the summer of 2023, in order to collect herbarium specimens, tissues for

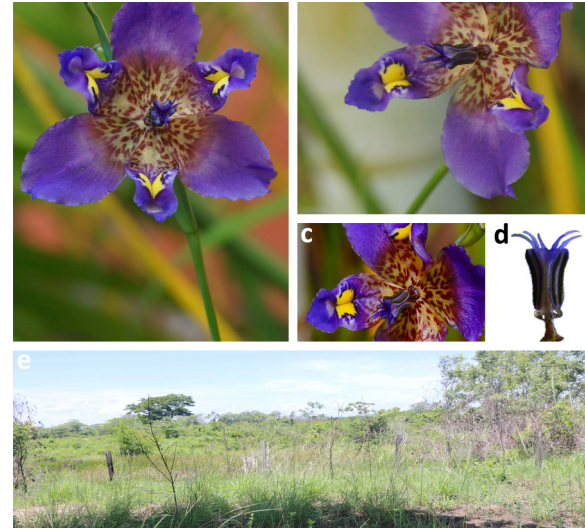
DNA extraction, observe the species in their habitat, analyze floral structures, take photographs, and record phenology (**Figure 3**). We collected four populations of *A. drummondii* and *A. silvestris* in Huimanguillo, Tabasco, and Palenque, Chiapas, Mexico. Live plants, bulbs, and seeds were also obtained and these were cultivated at the Jardín Botánico Didáctico of the Instituto de Botánica, Centro Universitario de Ciencias Biológicas y Agropecuarias of the University of Guadalajara, Jalisco, Mexico (**Figure 3e**).

The *Alophia* species are vegetatively very similar to each other. The most notable differences are in the floral structures (**Figure 3-5**). *Alophia drummondii* and *A. veracruzana* have flowers 4-5 cm in

diameter, the inner tepals have a yellow or white macula at the base of the limb, and their capsules are 1.4-2.4 cm in size. These species differ because *A. drummondii* has leaves 1.2-2.5 cm wide and the inner tepals have oil glands scattered on the lower half, partially covered by a fold (**Figure 3**). Meanwhile *A. veracruzana* has leaves 0.3-1.0 cm wide and the inner tepals have no oil glands (**Figure 3**). *Alophia intermedia* and *A. silvestris* have flowers 2.5-3.2 cm in diameter, the inner tepals are concolor, and do not have a macula at the limb base. Their fruits are 0.8-1 cm in size (**Figure 4**). *Alophia intermedia* is characterized by the presence of yellow anthers and is grown in elevations from 0 to 500m in Sinaloa and Nayarit (**Figure 2b**). *Alophia silvestris* is very similar to *A. intermedia*, but has extended inner tepals and purple anthers, and is found on the slopes of the Gulf of Mexico (**Figure 2c**).



ABOVE: Fig 3, Field studies of *Alophia* species



ABOVE: Fig 4, *Alophia drummondii*; BELOW: Fig 5, *Alophia silvestris*

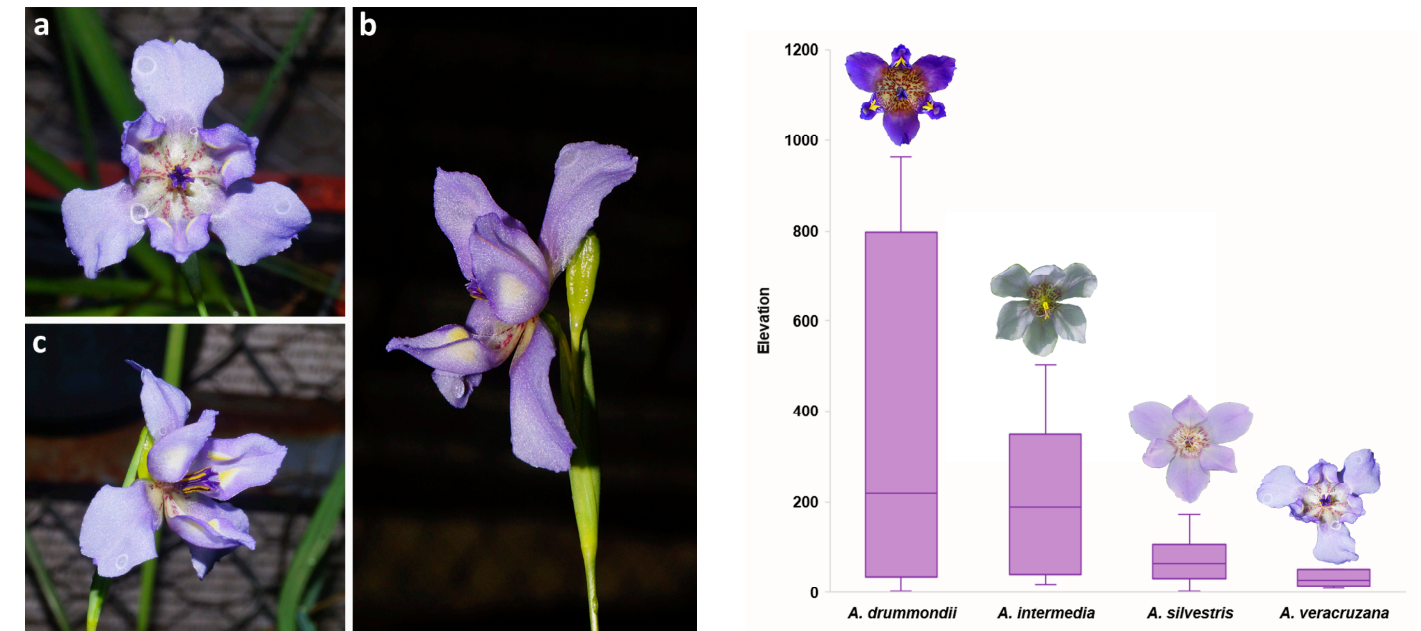


The Mexican liris are mainly distributed in the tropical dry forest. In this type of vegetation, we found to *A. drummondii*, *A. intermedia*, *A. silvestris*, and *A. veracruzana*. But, they grew in other vegetation types such as aquatic and subaquatic vegetation, pine-oak forest, cloud forest, grassland, thorn forest, tropical evergreen forest, tropical subdeciduous forest and xerophytic scrub. They prefer grassy sandy plains and forest openings, edges of seasonally wet depressions (**Figures 4e and 5f**). Considering the other vegetation proposal, *Alophia* is a typical element of the sabanoid vegetation. The liris prefer an elevation range from sea level to 1000 m, with most diversity between 0 and 100 m (**Figure 7**). These elevations correspond to the biogeographical provinces of the Pacific Lowlands, Tamaulipas, Veracruz, and Yucatan. We used this grant to conduct field surveys along the Veracruz province. We collected *A. drummondii*, *A. silvestris*, and *A. veracruzana* (**Figures 4-6**).

The liris bloom during the rainy season from June to August, depending on when the rainy season begins in each region. Most of species flower between June and August and the fruits ripen in the months of July and August. Seeds can be harvested in August and germinate in three to five days, they are very abundant, and the plants reproduced rapidly (**Figure 1 i-j**). Rainfall and temperature determine the vegetation development of *Alophia*. In the rainy season, the moisture activates the meristems and the aerial part emerges. In the dry season, the plants lose their leaves and go dormant. Liris grow in areas with annual rainfall ranging from 400 to 2500 mm. *Alophia silvestris* tolerates drought and high humidity conditions (800-3000 mm). *Alophia* can

survive in areas with temperatures from 22 to 28°C, but *A. drummondii*, *A. intermedia*, and *A. silvestris* are found in very hot locations with an average temperature of 26 to 28°C.

All species of Mexican liris fall into a threat category. However, their populations face different threats, such as urban growth, land use change, agricultural production, and livestock overgrazing. In this sense, it is necessary to know the geographic distribution area, to identify potential collection sites (**Figure 2**), and to recognize the habitats, phenology, precipitation and temperature where they grow. Later, it will be necessary to evaluate their conservation status according to criteria of the International Union for Conservation of Nature (IUCN), to design strategies for their conservation *in situ* and *ex situ*, such as the propagation of bulbs and the cultivation of seeds. In Mexico, the liris have no use. However, the species have potential as ornamentals and can be used in outdoor and pottery. Similarly to the Jahuites (genus *Tigridia*) they remain open few hours and are not recommended as cut flowers. Nevertheless, it is beautiful to have a pot of flowering *Alophia* as it has 1-5 inflorescences and each one has from two to five flowers.



ABOVE: Fig 6, *Alophia veracruzana* (Left), Fig 7 (Right). BELOW: Table 1, Characteristics of *Alophia* species

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Distribution	Vegetation type
<i>A. drummondii</i>						✿✿✿✿✿							USA (TX), Mexico (Chiapas, Oaxaca, Querétaro, Sn Luis Potosí, Tabasco, Tamaulipas, Veracruz)	Aquatic and subaquatic vegetation, cloud forest, grassland, thorn forest, pine-oak forests, tropical dry forest, tropical evergreen forest, and xerophytic scrub
<i>A. intermedia</i>						✿✿✿							Mexico (Nayarit, Sinaloa)	Pine-oak forests and tropical dry forest
<i>A. silvestris</i>							✿✿✿						Belize, Costa Rica, Guatemala, Honduras, Mexico (Campeche, Chiapas, Tabasco, Veracruz, Yucatan), Nicaragua	Aquatic and subaquatic vegetation, pine-oak forests, tropical dry forest, tropical evergreen forest, tropical subdeciduous forest, and xerophytic scrub
<i>A. veracruzana</i>							✿✿✿						Mexico (Veracruz)	Aquatic and subaquatic vegetation, tropical dry forest, and tropical evergreen forest

REPORT ON GROUP ORDER FROM SOUTH AFRICAN BULB COMPANY

Robert Lauf with contributions by Uli Urban

PBS is experienced with organizing the bulk purchases of books, most recently *The Amaryllidaceae of Southern Africa*, purchased through The South African Bulb Company (SA Bulb) and made available to members at cost. Through this transaction, we learned that the annual Rare Plant Fair in South Africa was cancelled because of weather, and SA Bulb had a lot of inventory already dug, washed, and packaged; they were thus offering discounts on these and many other items. Several PBS members have imported bulbs from SA Bulb in the past, so this seemed like a good opportunity to try a group order, and the team was assembled: Bridget Wosczyzna and Martin Bohnet would handle distribution of the bulbs as an ad hoc BX 495--Special Offer. Arnold Trachtenberg would handle payments. Bob Lauf and Uli Urban would aggregate member orders from the US and the EU, respectively, and Bob and Martin would deal with the import and inspection process. Members would prepay and therefore assume the risk of shipping losses.

For the novice horticulturalist, the prospect of importing plants can be daunting. First, navigating the rules and procedures for import permits and inspections can be complicated, especially for someone new to the process. Second, all those hoops are the same regardless of the size of the order; similar disadvantages are that the cost of air freight from halfway around the world is proportionately higher for a small order than for a large order, and the cost of the phytosanitary certificate is the same regardless of the size of the shipment.

PBS members based in Europe had in the past also done a joint order from Silverhill Seeds, which finally turned out well, but it took so long to arrive that they initially feared it would be a loss.

Results

The level of interest in this project far exceeded our expectations, leading all of us to feel like the dog who chases buses and accidentally catches one. The overall parameters of the deal are summarized in Table 1. We had 40 US members and 19 EU members from seven countries participate; individual member orders ranged from

around \$20 to about \$1200. It was gratifying to see that interest covered a wide range of genera and species, along with some hybrids, thereby serving our mission to get more of these interesting plants into cultivation outside of their native habitats. However, the sheer size of the EU order caused a problem because the German authorities considered it a commercial import, which would have needed more and different paperwork. They let it go through for this shipment but warned us not to repeat this.

Leigh and Johann worked continuously for several weeks to dig, trim, wash, and dry over 1600 bulbs. Each packet was prepared with a full-color label identifying the species. Each member's order was placed in a separate pouch. Upon arrival, each carton's contents were perfectly organized and spotlessly clean.

Bob Lauf sent US members a brief questionnaire, and out of 20 responses, overall satisfaction was 4.4 out of 5 stars. All but one respondent is willing to do this again, and 8 indicated a willingness to help in future group orders.

Lessons Learned

Ordering

By and large, members followed the instructions we provided; the aggregation of orders went smoothly and any glitches were very minor.

There were a few issues with winter-growing bulbs that had already started growing. In the case of species with very small bulbs, survival is precarious if they are dug, trimmed, and shipped in this state. One thing we can improve in the future is to place an order early in either the fall or spring and restrict it to winter- or summer-growing bulbs respectively, so that we are only ordering things that have been dormant and not yet begun active growth.

Shipping

A critical step in the shipping process is to get the bulbs from the inspection station to the bulb exchange coordinator. In the US, the international air freight does not include that leg of the journey! A good trick is to have the shipper provide the approximate package weight and dimensions *before shipping*. You can then generate a shipping label and email it to the shipper, who puts it in the box. Then after Animal and Plant Health Inspection Services (APHIS) clears the bulbs, they

slap the label on the box and hand it off to UPS, saving several days of sitting there. The whole procedure is shown in Figure 2. For shipments to Germany the procedure is simpler: Once the parcels are processed by import authorities, they will either be shipped to the home of the recipient as was the case with DHL, or the recipient could pick them up at the nearest airport as was the case with the books previously sent by air freight.

Table 2 presents the shipping history for both US and EU orders. There were significant glitches caused, apparently, by the DHL office in Johannesburg. This added at least two weeks to the total time in transit and customs for the US order. If we do this again, we will almost certainly pick a different logistics company.

Because of excessive delays for both shipments, some members reported losses of small bulbs through desiccation. The total loss was fairly small compared to the value of the order, and members were reminded to plant everything because most dormant bulbs are surprisingly resilient.



ABOVE: SA Bulb Co owner Johann Nieuwoudt sorting bulb labels for the PBS order

Uli Urban surveyed EU members but not everyone replied. One member thinks he lost a bulb of *Cyrthanthus* and Uli definitely lost two small rhizomes of the large form of *Zantedeschia aethiopica*. One member commented that the bulbs received were minute. Uli agreed to some extent: some of the bulbs he received (*Scadoxus*) are surprisingly small. The *Zantedeschia* rhizomes were about 1cm in diameter; had they been bigger they would probably have survived the delays.

Inspections

As we were updating the US import permit to add all the new genera being ordered, we became aware that *watsonias*, *pelargoniums* and **gladioluses* cannot be imported into the US because these plants can carry the bacterium responsible for Brown Potato Rot. This is a significant economic threat, and shows why APHIS is there in the first place. Another wrinkle is that APHIS uses a particular database of plant genus names and some bulbs of interest to us are known under various synonyms; only the name that is in the data base is recognized and available to add to your permit. Further complicating this, a plant may be listed under one genus in the APHIS system but under a synonym in the exporting country's data base, leading to different names on the phytosanitary certificate and the import docs. The shipper needs to be aware of this and list the item under the preferred synonym, even if it might be listed in their catalog under the other name. So there is no substitute for constant communication throughout the process, to avoid unhappy surprises during inspection. It is also imperative that the vendor understands the requirements and the process, and carefully makes sure everything is compliant.

In the EU, it appears that there are no restrictions on species of bulbs on offer by the SA Bulb Company for the EU. CITES listed species were not included either; that would make paperwork far more demanding and is best avoided.

US inspection results: The time spent at APHIS in Atlanta was 2 days, and only one pack was opened for inspection in each of the two large cartons. This attests to the value of presenting the inspectors with a shipment that is clean, well-organized, and properly labeled. The excellent service and helpful advice were consistent with our previous experience with the Georgia inspection station.

EU inspection results: The problem with the inspection in Germany was that one authority shifted responsibility to another one. So it went like ping-pong between Customs and Plant Health. As stated above, the size of the order made it appear commercial in the eyes of Customs; however, we were not given a threshold for a commercial consignment. It would be good to look into this issue before doing another group order of this size.

Distribution

The job of sending each package to each member was made easier because Leigh packaged each member's order separately. Upon arrival in the destination country, each order could be mailed out and billed like any other BX order.

For the EU, Leigh went even a step further after corresponding with us. She packed each order into a small separate box with the order number on it, so Martin only had to put the address sticker on, and ship, the individual boxes. This was meant to reduce Martin's workload. Unfortunately it turned out that the extra shipping volume meant the order was divided into two separate outer boxes, which were then separated in Johannesburg and treated very differently in Germany. The first box went through smoothly, but the second one

caused hiccups and headaches because the attached phytosanitary certificate "was already used and no longer valid." Therefore they charged a ridiculous €180 for yet another phyto for the second box. Our learning curve has been steep. We would not do individually boxed orders again. Customs authorities are not set up to receive phone calls; Martin tried calling several times but was always told to send emails, which were answered in a maddening standardized (if not automated) form. He finally managed to get the person in charge on the phone, explained the situation and was able to free the second box. It was then delivered to his doorstep free of further charge within a day or two.

Posting from Martin to the individual members was another story. Within Germany and northern and northeastern Europe, there were no issues. But shipments to Italy were very slow to arrive. Shipping to Portugal took about two weeks, to Spain a week longer, and the record was broken by our member in the Azores who received his parcel about 4 weeks later, bulbs still okay!

The overall reaction during the ordering process and afterwards was gratitude. None of the EU members complained about expense. The correspondence with Leigh always was flawlessly fast, efficient and very friendly—a nice experience.

PRESIDENT'S MESSAGE

Bridget Wosczyzna

As summer winds down the weather moderates, the light shifts, the first chill is in the early morning air and the SA bulbs are stirring, it is time I reached out to our membership and thanked each of you for your continued support. My gratitude to all of you and our Board is immense. Our community thrives: membership waxes and wanes over the years, but we are solid and steady.

This year saw a few changes, and we welcome them. Static societies are stuffy and grow musty. New energy and ideas are paramount. We added a new board member, Randy Linke, who brings another voice and perspective to the meetings. Emil Friend took over as Bulb Garden editor and has reworked the publication, has brought a dynamic energy and I truly look forward to seeing how this progresses with each edition. We ventured into importing opportunities with a book: *The Amaryllidaceae of Southern Africa*, and on the heels of that we again offered both US and EU members a rare chance to order plants directly from the grower in South Africa. I have heard from many members, usually in my role as BX manager, but also with encouragement and ideas presented to me in my office as

President. Our robust membership and voices are evidence of an engaged membership.

The South African Bulb Company order was a great success and we learned much in the process, which is covered in depth by an article herein by member Robert Lauf. On behalf of PBS, I would like to formally thank Bob for his efforts in shepherding this incredible opportunity. I would further like to thank both Uli Urban and Arnold Trachtenberg for facilitating the financial aspects of the orders, both in the US and EU.

PBS will continue to entertain the best avenues to bring our membership the latest and most interesting information related to our passion for bulbs from all over the world.

The BX and SX are the most wonderful advantages exclusively for PBS members. Without the donations of our stellar group of bulb enthusiasts, many of our pots would be empty. Obviously, the wiki is our other marvel and open to all to learn and reference for the common goal of growing great plants.

I am so proud to be part of this group. Every volunteered moment is a testament to the commitment we share to the community.

Thank you.

UNBOXING: THE BULBS ARRIVE

Bridget Wosczyzna

When I received notification that the shipment from SA Bulb Co had left the APHIS facility in Atlanta, I began tracking it in real time and finally the two very large boxes were delivered to my door. It was with no small amount of hope and trepidation that I cut the packing tape on the first box, opened it and noted how very well the items were arranged. I instantly grabbed a bag, then two, and gave them a delicate squeeze to determine if we had solid plant materials or mush. Everything was solid! The bulbs had survived. A very large sigh of relief. The real work had been done in South Africa; sorting and packing must have taken weeks. Here was true treasure on my dining room table. I then opened the other box to the same results: supremely organized and suitably packaged to make a long trip halfway around the globe.

One of the issues we (the organizing team for this bulb order) were very curious about was whether the APHIS inspectors would all of the packages. Or would they see the organized items, inspect one bag, assume the best for the rest and then release that box. And yes, this is exactly what happened with each of the boxes. Only one separately-bagged order was checked in each. These were opened, inspected, and compared against the manifest that we provided. Then the boxes were resealed, labeled and sent on their way to me. The inspectors were able to see how pristine and clean the random bags they pulled were, so they could trust that it was unnecessary to open every single bagged order.

It took me a few days to get all the orders organized and boxed up individually, and to calculate the shipping to each member. Dropping dozens of boxes off at the post office is the second best part of being Bulb Exchange manager. (The best part being that I get to look at all these incredible plants that go through my hands on their way, ultimately, to our members.)



LEFT: Laminated color labels were included with each item purchased from SA Bulb Co.

EDITOR'S NOTES

Emil Friend

Here we are in late autumn and you were meant to read these articles much sooner. Thank you for your patience as I learn to incorporate the happy task of newsletter production into my schedule amid various competing demands for time.

The Pacific Bulb Society has had a quite productive year in terms of providing members with access to a remarkable array of bulbs and seeds. Lisa Zankowski, appointed beginning this year to lead seed exchanges, distributed 155 offerings across three events. Bridget Wosczyzna, our dedicated president and bulb exchange coordinator, organized 597 donations from generous members, spread across 4 exchange events. This was in addition to the group order from the South African Bulb Company that a few members and board members put quite a lot of work into. South Africa is a biodiversity hotspot and home to so many plants that we love to have at home, so getting access to the SA Bulb catalog was a special opportunity.

Robert Lauf, Uli Urban and Bridget Wosczyzna have contributed reports to this issue about the SA Bulb Co order project. They add up to an inspiring study in logistics, cooperation and diligence.

This issue also features research from a 2023 PBS grantee, Guadalupe Munguía Lino, a scholar at the Instituto de Botánica within the University of Guadalajara. Guadalupe's portrait of a perhaps obscure genus of irids provides the kind of scientific data that can strengthen conservation efforts, which will in turn benefit entire ecosystems. As she notes, all the species in the study are threatened to some extent by various impacts of humanity upon the land. I admire her precise descriptions and attention to detail. I also was interested to share with you a more human side to the story, so I include here my followup interview with Guadalupe (GML).

BG: Why were you interested in studying *Alophia*?

GML: My research focuses on the biogeography of the tribe Tigridieae (Iridaceae) in North America. Currently, I am interested in resolving the phylogenetic relationships of the North American tigerflower group, which includes *Alophia*, *Cobana*, *Eleutherine*, and *Tigridia*. Although I said that *Alophia* have no use in Mexico, they can be used

as ornamental plants because of the beauty of their flowers.

BG: Were you surprised by anything you learned?

GML: I was surprised how difficult it was to find *Alophia* populations in Tabasco and Chiapas, Mexico. Most of these populations are near houses or orchards, or the vegetation has been transformed by intensive cattle grazing and the Maya train tracks. I learned that the alophias are endangered by the transformation of their habitat and need to be protected.

BG: What was the most difficult aspect of the research? What was the most fun or rewarding?

GML: My journey in search of *Alophia* began on August 8 2023, when we boarded a flight from Guadalajara City to Villahermosa, Tabasco, Mexico. We arrived at the *Alophia* locality indicated by the herbarium specimen and were only able to collect *Cipura campanulata*. We continued our trip to Balancán, Tabasco and right in the parking lot of the Instituto Tecnológico de los Ríos was *Alophia silvestris* along with *Hymenocallis littoralis* and *Curculigo scorzonrifolia*. Our trip continued to Chiapas, where we were able to collect the same species in grasslands with *Curatella Americana* and *Byrsonimia crassifolia*. On the way back to Villa Hermosa we collected two populations of *Alophia drummondii*. The trip ended on August 11th. It was very gratifying to collect leaf tissue from four populations of *Alophia* that will be used in the phylogenomics of Tigridieae, and thus to learn about the fascinating evolutionary history of these ephemeral plants.

It was very stressful to feel the heat at 9:00 a.m. Also, the flowers of *Alophia* are deliquescent and last a few hours, so by 9:00 am the plants had already closed their flowers. So we had to get up at 4:00 am and be at the collection sites between 5 and 8 am. It is very difficult to determine the species of *Alophia* without flowers because they are vegetatively very similar. By getting up so early, I was able to confirm that *Alophia veracruzana* does not grow in Tabasco, as previously reported, and that it was rather a misidentification of a specimen of *Alophia drummondii*.

Services of the PACIFIC BULB SOCIETY

SEED AND BULB EXCHANGES

Members get access to an ever-changing list of bulbs and geophytes, many unusual or even rare. Exchanges happen twice per year in the US and EU.

THE BULB GARDEN

Our quarterly newsletter mailed to you. Informative articles, reports from grant recipients, and Society updates. Back issues are now archived and searchable online.

FORUM

Our interactive online forum allows experts and beginners alike to share their passion, knowledge, and questions. Post photos, get advice, or figure out the name of that mystery plant you've always wondered about.

WIKI AND KNOWLEDGE ARCHIVE

The PBS Wiki is a database of bulb photos and descriptions that is free to the public and relied on by thousands of people a day. Our website archives also offer resources covering a wide range of horticultural topics.

CONNECT

Many members allow us to share their contact information, making it easy to get in touch with other bulb aficionados near you.

SCHOLARSHIP

Each year we offer grants to support research on the botany, evolution, and specialized adaptations of geophytic plants.

JOINING IS EASY

with Paypal at www.pacificbulbsociety.org

or mail a check

**PBS c/o Arnold Trachtenberg
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\$25 US/\$30 International (USD)**

The Pacific Bulb Society is a non-profit 501(c)3 registered in the United States. Our mission is to build community among people interested in bulbs and geophytes. We do this by hosting the exchange of knowledge on our web forum and email list, by organizing twice-yearly exchanges of seeds and bulbs, and by continually improving our public wiki database. We also offer annual grants in support of bulb research.

Learn more at

www.pacificbulbsociety.org

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Mary Sue Ittner (Wiki)

THE BULB GARDEN is the newsletter of the Pacific Bulb Society. It is published quarterly and is a benefit of paid membership. Kindly direct comments, suggestions, article submissions or advertisement inquiries to:

Emil Friend, editor

ebfriend@gmail.com

FRONT COVER: One of the high-quality bulbs shipped from the South African Bulb Company in the PBS group order; BACK COVER: Sprekelia formosissima blooming in October in the garden of Emil Friend



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