

# The Bulb Garden



~Gardening with Bulbs~

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## *Scadoxus nutans* and Other Epiphytic Plants in Southwestern Ethiopia

Jonathan Hutchinson

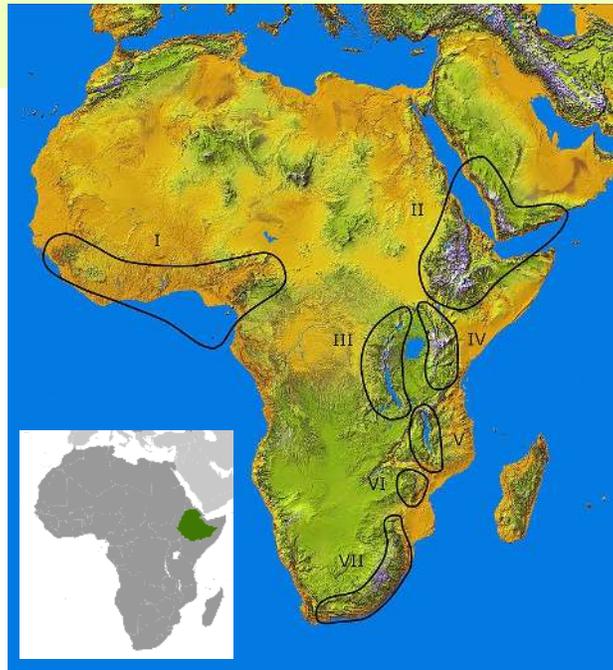
After finishing his studies and gaining a Diploma in Horticulture at the Royal Botanic garden Edinburgh, Jonathan spent a year working at the Royal Botanic Garden, Sydney, which cemented his interests in Southern Hemisphere floras. Since then he has taken every opportunity to travel always getting much enjoyment from seeing plants in their native habitats. In contrast to his professional role in horticulture he has always enjoyed growing plants under glass which started with Cacti and succulents then evolving to South African bulbs particularly the Amaryllidaceae this then leading to a major interest in *Scadoxus*. He now tries to limit his personal collection to African plants that grow in similar situations to this beautiful and rewarding genus. Presently he works at the RHS Garden Rosemoor in

North Devon. – Ed.

In 2009 I made my first visit to the Afromontane Forest plant community in southern and southwestern Ethiopia, in particular to study the epiphytic habitat of *Scadoxus nutans* (Amaryllidaceae) and to see this endemic species in flowering and fruiting stages. A grant from the Pacific Bulb Society aided me to make a second trip in 2013 to add a study of other components of this environment, in particular the other epiphytic elements that add a huge range of diversity.

Of the nine species of *Scadoxus*, three are native to Ethiopia. The other two species are much more widely distributed than *S. nutans*. *Scadoxus puniceus* has a very wide distribution through Africa, but on the eastern side of the continent it is absent from Kenya, making the Ethiopian plants totally sep-

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**Large Map:** The seven Afromontane regions. By Ulanwp - Own work; based on satellite image from Nasa Image: Topography of africa.jpg, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=8798563>. **Inset:** Ethiopia is highlighted, indicating that its political borders encompass a significant portion of Zone II.

## *Calochortus* of Western North America (cont'd)

*Kipp McMichael is a professional web developer and an amateur naturalist with several degrees, none of them plant-related (but don't tell that to his overly-large plant collection). He grows cacti, succulents, caudiciforms, and far too many bulbs in his home garden in Berkeley, CA.*

*We hope you enjoy this article, which is the second half of Kipp's ruminations about his geophytic travels. For the previous installment, see Volume 13, Issue 3-4. — Ed.*

Even after spending March-May of 2015 visiting *Calochortus* populations from the Bay Area to Southern California, my appetite for these lovely flowers was unsated... after all, there were more species to see!

At the end of my weekend with Fred, we had tried and failed to find *Calochortus simulans* on our way through San Luis Obispo County, California (CA). Unwilling to accept defeat, I embarked on a solo follow-up trip the next Friday morning to Hi Mountain near Arroyo Grande, CA. I found this taxon, reminiscent of a red-throated *C. venustus*, growing on the slopes on either side of a ravine where the road made a sharp switchback. Only a few feet away was also a small population of *Calochortus clavatus* just beginning its bloom. On my return to the Bay Area, I also made a late morning stop near Jolon, CA to catch the lovely purple amole, *Chlorogalum purpureum* var. *purpureum* blooming on hardpan soil beneath a sparse oak canopy.

After my earlier observation of *Calochortus splendens*/ *davidsonianus* in Southern California, I wanted to see more populations of this species. The distribution of the putative *Calochortus splendens* is disjunct, with the southern portion from Monterey



From top to bottom: *Calochortus simulans*, *C. clavatus* var. *recurvus*, and *C. davidsonianus*. Photos by Kipp McMichael.

County to Baja California, and the northern portion from Contra Costa to Glenn counties, CA. I decided to bookend the population with observations and hence headed to the border between Lake and Glenn counties (CA) to see the northernmost stands.

Like the rest of California, the landscape when I arrived had experienced three years of drought, and this year's landscape was the driest rainy season of the three. The parched landscape that greeted me

was not encouraging, and I had nearly resigned myself to a failed search when a flash of pink above the road revealed a small but healthy population growing in the shade of a juvenile ponderosa pine. Intriguingly, these flowers were more like the plants in Southern California than flowers of *Calochortus splendens* from areas between Southern and Northern California. I therefore call this taxon *Calochortus davidsonianus*.

Following the preceding pair of solo trips, I was joined by Leon for another foray to see several taxa in central California. We arrived early at Cuesta Ridge in San Luis Obispo County, CA to find a sunlit island surrounded by a sea of maritime fog filling the valleys below the ridge. The road, made more of potholes than pavement, was slow going but improved markedly when the pavement ended and the red, serpentine-derived dirt took over. We stopped below a rocky spine atop the ridge and made our way through the chaparral-covered slope toward the outcrop.

Just as we arrived at the rocks, Leon and I froze as the sizzling buzz of a rattlesnake alerted us to the serpent's presence directly in our path. Unable to find another route, we lightly harassed the snake into giving way and made it to the top of the ridge to find *Calo-*  
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## *Calochortus* of Western North America (cont'd)

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*chortus clavatus* in bloom. As we returned down the ridge, the rattlesnake reproached us with another short rattle from the rocks off-trail where it had taken refuge. When we reached the truck, the fog had cleared enough to see the city of San Luis Obispo, our next destination, in the valley below.

We arrived at the Laguna Lake Open Space and headed for the serpentine-strewn hillside on the eastern side of the park. A scant few paces up the hill we saw the first, spidery, anther-dominated blossoms of *Calochortus obispoensis* emerging between the gray-green stones. This species is small in both flower and capsule, but the plants were happy enough with the season's rains to have multiple buds and capsules per plant.

We left Laguna Lake to return to the bluff near San Simeon, CA where several species of *Calochortus* bloom in overlapping waves through the spring and summer. We were hoping to finally catch *Calochortus clavatus* var. *recurvifolius* in flower after having observed developing blossoms earlier in the season. In this fog-moderated location a few feet from the Pacific Ocean, the four- to six-inch tall plants are slow to develop but our timing was finally right and we found approximately 20 plants in bud or bloom. The nearly stemless blossoms of this variety are a much richer orange-yellow than other forms of the species and the rust-colored throat markings are particularly pronounced. Growing on protected public lands, the plants seem to prefer a narrow strip three to six feet from the bluff edge. With the majority of the population growing a mere landslide away from the surf below, the steady onshore winds seem vital to dispersing the seeds of this species ahead of the eroding waves.

Both sides of Highway 1 in this area are thickly populated with a diminutive form of *Calochortus luteus* that extends from the ocean's edge to the hills east of the highway. A population so large reveals the flower varia-



From top to bottom: *Calochortus obispoensis*, *C. luteus*, and *C. tiburonensis*. Photos by Kipp McMichael.

tion in this species and among the innumerable lemon yellow blossoms I also found an off-white specimen with beautiful purple markings.

*Calochortus* lovers in the Bay Area of California are lucky to have perhaps the rarest, and certainly the most enigmatic, of all *Calochortus* species living on the Tiburon peninsula in San Francisco Bay. Growing on a single serpentine ridge overlooking the Bay, *Calochortus tiburonensis* opens its highly variable, fimbriate flowers starting in late May.

Looking like no other nearby species, this taxa seems the result of both long-distance dispersal and hybridization. Despite a genetic relationship to *Calochortus umbellatus* (which blooms earlier in spring just downslope), this species has vertical capsules and a reticulate bulb coat more like Southern California species; yet, unlike all other taxa with vertical capsules, *C. tiburonensis* has black seeds.

As I finished my survey of the blossom-strewn slope, I caught site of an unexpected delight - a chartreuse-colored flower growing on a plant that seemed unable to produce red pigment. A unique variant of a rare taxa, this greenish-yellow wonder might be the only *Calochortus* of its kind in existence!

Both Fred and Leon joined me on my next trip to view *Calochortus*, this time focusing on a special population of one of the more common taxa, *Calochortus venustus*. In the central to southern Sierra Nevada Mountains of California there grow, intermittently, small populations of this normally white taxon that bear flowers in much richer hues. In the foothills near Shaver Lake, CA these highly colored plants are especially common (although still a minority among the typical white flowers). I was prepared for colorful blossoms, but the sumptuous flowers in solid or multi-toned colors of purple, magenta, orange and yellow were surely the most striking of the season. We caught the popula-

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## *Calochortus* of Western North America (cont'd)

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tion in the first weeks of blooming and were left to fantasize about the colors of the hundreds of still unopened buds as we made our way home.

With the advent of June, many *Calochortus* had finished their season

so my focus necessarily turned to the later-blooming species. The first among these was a highly disjunct population of *Calochortus clavatus*, the robust *Calochortus clavatus* var. *avius*, which grows in the Sierra Nevada, CA foothills near Highways 50 and 88. Leon accompanied me as we found several populations just entering their blooming season with two- to four-foot tall stems holding aloft robust golden bowls three to four inches across.

Normally a species of hot habitats west and south of the Central Valley of CA, this population was growing on igneous soils in sunny spots among conifers.

A plant which thrives after forest fires, massive blooms of *C. clavatus* var. *avius* are

a silver lining to the large conflagrations which have struck this area of California the past few seasons.

Leon and I continued further along Highway 88 to a lava cap meadow – a sparse plant community growing on igneous soils – just east of Ham's Station, CA. There we hoped to find *Calochortus coeruleus* near the southern end of its range. After a few minutes walking between stunted ponderosa pine and incense cedar, we found this lovely, palest-purple taxon near the end of its bloom.

The final excursion of my wondrous summer of *Calochortus* pursuits took place in late June – slightly earlier than I would have liked for some of the target taxa but necessary since non-floral commitments were scheduled to fill all my weekends in July. Fred and Leon both joined me for an ambitious overnight

trip returning to several spots in central California that we'd visited earlier in the season.

Our first stop was Mt. Pinos (in the Coast Range of California), where we hoped to see a red variety of *Calochortus venustus* that grows at the base of the

mountain. The ongoing drought had not been kind to this area and, after an hour's search through the sparse ponderosa forest, we found only ten plants in growth or bloom. Despite the small numbers, these flowers – in a dazzling spectrum of deep, pure reds – were nevertheless worth the trip.

Next we headed to the top of Mt. Pinos to hopefully catch *Calochortus invenustus* where it bloomed in open areas on the summit. We were rewarded for our high-elevation hike with a beautiful display of pale purple, nearly stemless flowers tucked in among the cushion plants of this alpine habitat.

We left Mt. Pinos via Lockwood Valley Road to visit a site where both *Calochortus kennedyi* and *C. splendens* bloom in literally stem-touching proximity. A few late-

season rains appeared to have been enough for these taxa as we found a healthy population of both plants near the end of the bloom period. The beautiful vermilion bowls of *C. kennedyi* hugged the ground beneath the thin, tall stems of the typical form of *Calochortus splendens*. The latter plants, having shallow pink bowls filled with white hairs that totally obscure the anthers and throat, were quite unlike the deep, darkly throated, and sparsely-haired flowers of what I have labeled *Calochortus davidsonianus* from both Northern and Southern California. In coming seasons, I hope to visit more populations of *C. splendens* to gain a better idea of the geographical variation in

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Top left: *Calochortus clavatus* var. *avius*; top right: *C. coeruleus*. Bottom, clockwise: *C. fimbriatus*, *C. kennedyi*, *C. splendens*. Photos by Kipp McMichael.



## ***Calochortus* of Western North America (cont'd)**

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these species.

Fred took the wheel to give me a break from driving and, apparently, to test the high-speed maneuverability of my car as we careened along the twists and turns of the Maricopa Highway. Leon and I, having gained a new appreciation for speed limits and non-white knuckles, were happy to arrive at our hotel near Los Olivos, CA and rest up for the next day's adventures.

On San Marcos Ridge (overlooking Santa Barbara and the Channel Islands) grows what I consider the most beautiful of all *Calochortus*, *Calochortus fimbriatus*. We found these robust plants, whose pink, orange and purple bowls overflowed with brilliantly colored filaments, growing on granite and sandstone outcrops sprinkled along the ridgeline. Another example of a drought-defying location and species, these plants were beginning a substantial bloom and we took our time enjoying this gorgeous taxon at this final destination of our final trip of the season.

As we returned home from Santa Barbara County, CA, we discussed the season we'd enjoyed and, more importantly, our plans for next year. A record-setting El Niño forecast for the wet season and enormous areas of *Calochortus* habitat freshly burned from an unprecedented summer of wildfires portend many fine blooms in 2016 when I hope to focus on the rare taxa of Northern California and Southern Oregon. Stay tuned!



Kipp's photos allow us to compare the shades of *Calochortus venustus*. The photo in the top left corner was taken at Mt. Pinos; the other three were taken in the Sierra Nevada foothills.

## *Scadoxus nutans* and Other Epiphytic Plants in Southwestern Ethiopia (cont'd)

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arate. The other species native to Ethiopia is *Scadoxus multiflorus* subsp. *multiflorus*, also quite variable and wide-ranging.

As holder of the British National Collection of *Scadoxus* I am



keen to put the plants I grow into context. By growing some of the plants that *Scadoxus* can be found with, I also hope to raise awareness of the diversity of Afromontane systems.

Among the epiphytes in which I am interested is *Canarina eminii*, related to Ethiopian *C. abyssinica* and *C. canariensis* of the Canary Islands, both non-epiphytic; I looked forward to comparing the three species and their habitats. Of all the vascular epiphytes, ferns are certainly the most frequent in the Afromontane Forest; some trees seemed entirely clothed in a single species, but in fact these ferns cohabited with a wide range of other epiphytes, including orchids.

Melaku Wondafrash, in charge of the monocotyledon and pteridophyte herbarium specimens, and Mekbib Fekadu, Botanist and Lecturer, who work in the Herbarium at the University of Addis Abba, suggested that a two-week trip would allow us to see

the elements of the flora we were interested in, leaving a final week for processing the Agreement of Understanding. We planned to follow the same basic route taken in February 2009. This time the epiphytic plants would be at their best

because we would be traveling at the end of the wet season rather than at the end of the dry season.

One exciting aspect of the trip was collecting seed that

To better understand *Scadoxus multiflorus* (above), Jonathan studied *Scadoxus* on *Schefflera volkensii* (below). Above: BetterWORLDphoto - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=17623871>. Below: Photo by Jonathan Hutchinson.

would complement the *Scadoxus* Collection. Prior to my arrival, Mekbib met extensively with the Institute of Biodiversity to ensure that I could collect and export seeds.

A day's drive south from Addis Ababa took us to Robe, starting point for our trip to Harena Forest. Early the next morning we drove across the high, broad plains of

Bale Mountain, a captivating sight with endless stretches of *Helichrysum* scrub, the towering and steel-blue-flowered *Lobelia rynchopetalum*, along with sightings of the very rare Ethiopian Wolf. Late in the morning we reached Rira.

On the previous trip in February a few *Canarina eminii* were just coming into growth here. Soon we came across a number of excellent examples in full growth, with their characteristic trailing stems. One tree, a broad-canopied *Schefflera volkensii*, was festooned with *C. eminii* along with numerous other epiphytes, including *Begonia wollastonii*, *Pilea* sp., *Peperomia abyssinica*, *Peperomia tetraphylla*, and *Arisaema shimperianum*.

A filmy fern had formed a sizable colony, indicative of high rainfall and humidity, though we were surprised that such a delicate-looking plant could survive relatively dry periods in a desiccated state.



The shade of the broad *Schefflera* canopy was obviously one reason why the epiphytic growth was so successful, protected from the intense sun and also enjoying a huge  
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## *Scadoxus nutans* and Other Epiphytic Plants in Southwestern Ethiopia (cont'd)

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mid, buoyant atmosphere.

The next morning we traveled southwest, and as we descended the country became much more agriculturally developed. Gladly, there were still a few areas worth a stop. One yielded a lovely red-flowered *Echinops* sp. similar in form to *E. ritro* but larger, reaching over three meters in height.

Native vegetation on the following day was even further reduced, so we all hastened to Jima, the base for the second part of our trip. Here in the regions of Illababour and Kefa we would find the restricted *Scadoxus nutans* and hopefully more *Canarina eminii*.

Though *Scadoxus nutans* can grow terrestrially, it is more typically an epiphyte. We found one that had obviously started life in the tree above, become detached, and fallen to the ground. *Scadoxus nutans* and *Canarina eminii* grew on a number of tree species; the most important factor seemed to be plenty of other epiphytic

Generally *Canarina eminii* was in fruit, allowing collection. A couple of plants in flower showed a possible range of colour variation, dark red outside and yellow with red veins inside, for instance. The wild plants also varied in size; it will be interesting to see whether these size differences persist in cultivated plants. How these plants grew was intriguing; perhaps they grew just where the seed became lodged, but some plants had very long, thin, extended tubers that hung down vertically. Typically each tuber

tation, and a local youth helped by climbing up for specimens.

I had thought that the tree survey would be an ideal time to collect *Scadoxus* root material and samples of the growing medium, as I wanted to see if there was any mycorrhizal



To better understand *Scadoxus punicius* (above), Jonathan studied *Scadoxus* growing 20 km east of Bonga (below). Above: De Rotational-Own Work, public domain, <https://commons.wikimedia.org/w/index.php?curid=5074427>. Below: Photo by Jonathan Hutchinson.



growth likely to secure fallen seed from parent plants. Host trees included *Shefflera volkensii*, *Ekebergia capensis*, *Allophyllus abyssinicus*, and a species of *Trema*.

produced one stem; a few had two. In contrast, *C. canariensis* produces a large caudex with many more stems. We were thwarted from our next destination by local disturbances, and from a possible substitute by the replacement of native forest by coffee plantations. Finally a Forestry Division staff member offered to take us to an area suitable for our survey. On arriving there, we found rich epiphytic vege-

evidence in the root tissue and also to determine the soil pH in epiphytic situations. I did manage to get root material from three separate *S. nutans* plants. All the tests will have to be done in Ethiopia because removal of endemic plant material is not permitted.

I was also keen to collect fern spore samples. Ferns were undoubtedly beneficial to other epiphytes in getting a foothold on a branch or in a crevice, as the seed is caught in the accumulated fern debris. Some that seemed particularly good for colonization were *Arthropteris monocarpa* and *Phymatosorus scolopendria*, both stoloniferous; the latter has been seen growing with *S. nutans*. *Drynaria volkensii* seemed a particularly suitable host, with its sterile fronds producing a basket-like arrangement where organic material accumulated.

As we continued further north from Tepi we came to richly diverse areas with good elements of tree fern and bamboo forest. We made a num-

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## Steppes: The Plants and Ecology of the World's Semi-Arid Regions

Reviewed by Kathleen Sayce

By the Boys From DBG: Michael Bone, Dan Johnson, Panayoti Kelaidis, Mike Kintgen & Larry G. Vickerman, Timber Press 2015, \$US 49.95 <http://www.timberpress.com/books/steppes/bone/9781604694659>

Bulbophiles rejoice! There is a new book on the shelf to help those who live outside steppe regions to better understand steppes and their microclimates world-wide. This may improve the chances that a choice steppe bulb or shrub from Patagonia/Central Asia/South Africa/Central North America has in our gardens. It also makes an enticing proposal for tours of steppes.

In North America, many are familiar with some portion of the Central North American steppe region, which includes the intermountain west, east of the Sierra Nevada and Cascades, east to the Great Plains. The treatment of this and other steppe regions helps make sense of what otherwise seems a uniform landscape, shrubbier than desert, drier than forest. With changing climates, this hints at what might result, plant-wise, for many regions that are drier, colder, warmer, or wetter.

The book's layout is deceptively simple, and the details are numerous. After an overview of steppe climate, soils, geology, geomorphology and floristics, each major region is described by one of the authors. They are ordered by size from the largest (Central Asia) to smallest (South Africa). All steppes are complex in terms of physiography (geology, climate and soils), which leads to complexity in plant distributions. Some of those complexities are revealed in the text, including connections between plants, animals, and people. I was particularly interested to read about which steppes have major fire elements, and which do not.

Each section has a Plant Primer where species are discussed by family, including bulb families; I use the term 'bulb' widely here, to include rhizomatous families, as with Pacific Bulb Society's wide inclusion of species. After absorbing physiography hints in the main section you can go directly to families of interest

and absorb the specifics. I made notes on species to try, albeit knowing that winter rain screens can do only so much to moderate rain, and nothing to deepen winter cold in my mild maritime climate.

In each section there were points of particular interest:

In the **Central Asia Steppe** section, Michael Bone discussed the Aksu-Zhabagly Nature Reserve, which contains ancient wild apple forests in a deep river canyon fed by snow and glacial melt, and is thus cooler than the surrounding grasslands. Many of our com-

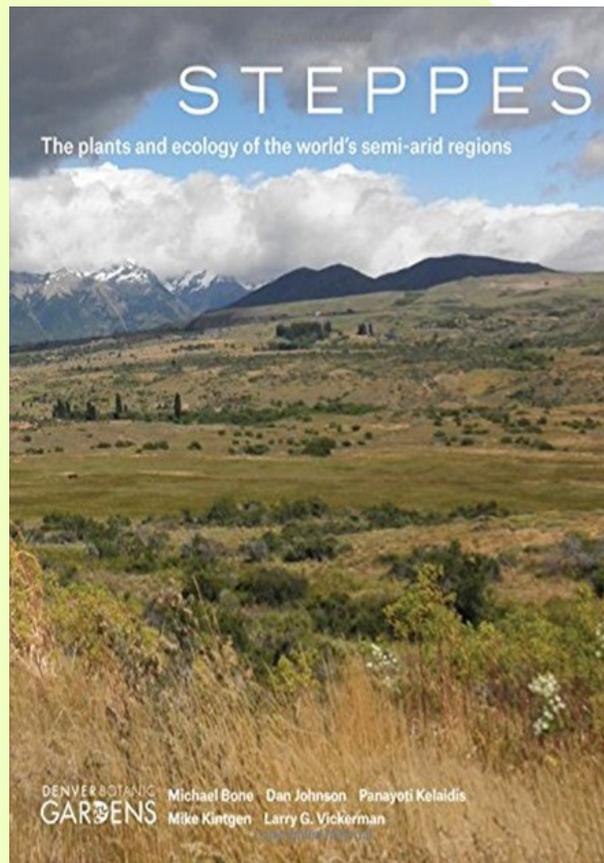
monest and oldest bulbs come from the western portion of this steppe, including tulips, lilies, irises and other bulbous plants. I tried not to look at the mentions or photos of *Eremerus*, because at current count, I've killed at least five, including one grown from seed in my cold frame, which then died during winter number two in the garden. Weather, deer and slugs all played parts, true. But the sad result was that none survived to flowering.

In the **Central North American Steppe** section, Larry Vickerman mentioned *Nemastylis geminiflora*, prairie iris. I checked the PBS List, and found only one mention of this North American irid, from someone looking for seeds or bulbs several years ago. I wonder if they ever found any sources?

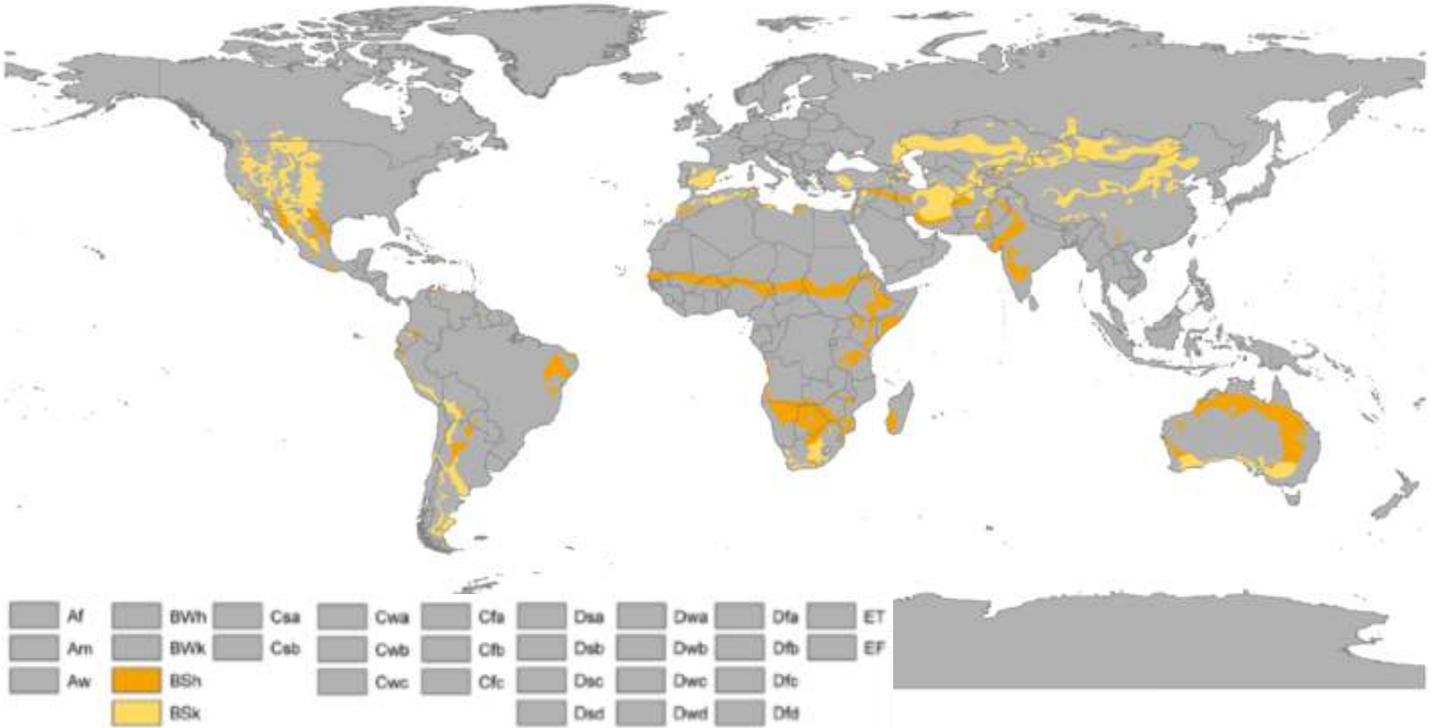
The **Patagonian Steppe** section was written by Mike Kintgen; the plant primer discussed few bulbs, though *Rhodophiala* and *Astroemeria* are mentioned in the overview. I was hoping for comments on *Solenomelus* and *Sisyrinchium* species, and perhaps some hardy *Zephyranthes*, but no. Numerous enticing shrubs and rosulate violets are discussed, as well as *Astroemerias*.

The **South Africa Steppe** was of particular interest, as I've been reading Panayoti Kelaidis' blog on his recent plant trips to that country. Here he writes about many of the South African bulbs we discuss weekly on the PBS List, starting with *Brunsvigia*, continuing through Irids and *Gladiolus*, and ending with torch lilies, *Kniphofia*. Thankfully, I can grow torch lilies!

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## Steppes: The Plants and Ecology of the World's Semi-Arid Regions



Koppen World Map. BSh (the darker color) represents the hot semi-arid steppe climate region; BSk (the lighter color) represents the cold semi-arid steppe climate region. By Koppen\_World\_Map\_Hi-Res.png: Peel, M. C., Finlayson, B. L., and McMahon, T. A.(University of Melbourne)derivative work: Me ne frego (talk) - Koppen\_World\_Map\_Hi-Res.png, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=14797406>

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There are many familiar genera here, along with thorough descriptions of their microclimates.

As the northern hemisphere heads into another winter, this is a good reading choice for those dim, cold days ahead. It's inspired me to reread Janis Ruksan's Buried Treasures, to place his collecting trips in the larger context of the Central Asia Steppe.

Thanks to Denver Botanic Gardens and its diverse team of horticulturalists and botanists for this botanical overview of all four steppe regions. Some of Timber Press's recent books have seemed lightweight, so it's positive to see this solid treatment of one of the world's fascinating ecosystems. It would be good to see follow-on books focusing on each steppe region with, of course, major sections on bulbs in each one. But that's getting way ahead of the fact that this book is a worthy read and a good library addition.

**Your board of directors did not meet in January. We'll get you all caught up on our activities after our March meeting!**

### Treasurer's Report, Year End 2015

<b>BALANCE 1/1/15</b>	<b>\$36,435.69</b>
U.S. Members	\$4,740.00
Overseas Members	\$2,950.00
Contributions	\$200.00
BX Receipts	\$6,269.52
Investment results	\$20.44
<b>TOTAL INCOME</b>	<b>\$14,179.96</b>
BX/SX Postage	(\$2,564.79)
BX/SX Supplies	(\$754.68)
BX/SX Support Staff	(\$160.48)
Board Conference Calls	(\$330.38)
Treasurer's Supplies	(\$319.95)
Total Publications	(\$5,045.00)
PayPal Expense	(\$795.86)
IRS non-profit filing fee	(\$850.00)
Bulb Garden editing	(\$666.50)
<b>TOTAL EXPENSES</b>	<b>(\$11,487.64)</b>
<b>Net Change in Account</b>	<b>\$2,692.32</b>
<b>BALANCE</b>	<b>\$39,128.01</b>

## *Scadoxus nutans* and Other Epiphytic Plants in Southwestern Ethiopia (cont'd)

(continued from page seven)

ber of stops. Orchids seen included *Aerangis luteoalba* var. *rhodosticta* and *Polysticha cultriformis*. In this very wet environment we saw a number of *Canarina eminii* growing closer to the ground, including one with an orange flower and red veining. On riverbanks we enjoyed seeing tree ferns and some wonderful massive fig trees that, although maybe not as ancient as they looked, gave a wonderful feeling of peace and calm. I was particularly pleased to see foliage of the terrestrial orchid *Nervilia* in the dappled shade.

After so many wonderful areas and plants, the return drive to Addis Ababa seemed mundane, but the day did have two surprises for us. One was a large clump of *Scadoxus puniceus* on the roadside. The second was an area where Melaku had seen *Scadoxus multiflorus* subsp. *multiflorus*, and though we only saw one nibbled leaf of this plant, the stop did yield one last seed collection of *Canarina eminii*, far removed from the collections in Harena Forest and the southwest.

On returning to Addis Ababa we had the allocated time to sort out the paperwork for the Material Transfer Agreement, identify the ferns, and clean and dry all the *Canarina eminii* samples, which then were divided between myself and the Ethiopian Institute of Biodiversity. They would freeze the seed for future research.

There was still time to visit Menagesha Forest, which is relatively close to Addis Ababa and more than 9,000 hectares (22,000 acres) in extent. This *Juni-perus procera*-rich woodland has a diverse floristic mix. As is inevitable on any botanizing trip, our 4x4

got stuck and we spent most of our visit to Menagesha Forest getting ourselves back onto the road. We eventually found a number of groups of *Scadoxus puniceus*, some growing with the restricted endemic *Arisaema addis-ababense*. There were epiphytic orchids too; I noticed how on a single tree the epiphytic environment could vary so much, for the range of plants growing there depended on the siting of a plant. For instance, one small orchid was growing on the underside of a sloping tree trunk, which was dry at the time and receiving no runoff from the saturated upper side, which was well clad with moss and another orchid, *Stolzia* sp. Prior to this I had found it difficult to understand how orchids that came from the same areas

could have such different growth requirements.

In conclusion, seeing *Scadoxus nutans* again in habitat was a thrill for me, and observing it growing with a wide range of other epiphytes in a

variety of situations did a lot for my understanding of its requirements for successful cultivation. Combined with the prior visit during its dry resting period, this trip has given a full picture of the plant's growth pattern. *Scadoxus puniceus* was seen in both Afromontane Forest and in a more exposed site, suggesting its adaptability. I had known little about *Canarina eminii* beyond my experiences of trying to grow and understand a few plants' erratic growth habits. Seeing many examples of this species in a wide range of habitats greatly improved my understanding of the plant's needs. In particular, one group in Harena Forest growing close to a colony of filmy ferns made me realize how much water these plants must get during the wet season. Even during dry times of year, they will get enough moisture to prevent total desiccation.

Being allowed to collect seed on this trip was another huge benefit. This seed resource and the ability to experiment with different cultural techniques and regimes will be invaluable. To get permission to collect, we had to specify the material, and we requested

(continued to next page)



Jonathan was also very interested in studying the epiphyte *Canarina eminii* and its habitat.

## *Scadoxus nutans* and Other Epiphytic Plants in Southwestern Ethiopia (cont'd)

(continued from previous page)

*Scadoxus nutans*, *Ilex mitis*, *Canarina*, and spores from a range of common epiphytic ferns. Collecting *S. nutans* seed was denied due to its endemic nature. Despite this disappointment, the Collection already holds this species, so any findings or techniques I wish to employ can be undertaken on these plants.

Of more importance was the collection of root material and soil samples from *S. nutans* to test for mycorrhiza and soil pH. These samples are to be tested at Addis Ababa University, and I hope to receive the conclusions in due course.

I hope another visit will be possible. This country's flora makes it a hot spot of diversity in the environmentally vulnerable Horn of Africa. A Memorandum of Understanding between Ethiopian institutes and the Royal Horticultural Society (Great Britain) would benefit all involved bodies. Hopefully this would give RHS staff and students the opportunity to work in Ethiopia and explore for themselves this beautiful, diverse, and threatened flora.



Here are a few more of Jonathan's pictures capturing the various habitats of the epiphytic *Scadoxus* at the center of his research.



### Acknowledgements

From the outset, as with my initial trip to Ethiopia, Melaku Wondafrash and his colleagues were very positive about the suggested trip and contributed in many ways to make it a success. Mekbib Fekadu spent many hours undertaking the required paperwork to make the transfer agreement possible, so that I was able to return home with a wealth of habitat-collected seed. The assistance of Dr. John David of the RHS was also much appreciated, with his thoughts on

how to fill in elements of the paperwork. I am immensely grateful to the following bodies that provided funding: The Finnis Scott Foundation, The Pacific Bulb Society, Plant Heritage (Devon Group), and the RHS Bursaries Commit-

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Thanks again for your continued support of the Pacific Bulb Society!

## Gardening with Bulbs



In this issue we continue with Kipp McMichael on a *Calochortus*-lover's dream tour of Central California. Photo: *Calochortus invenustus* by Kipp McMichael.

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