

# The Bulb Garden



~Gardening with Bulbs~

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## Overview of the Species of the Genus *Oncostema* in Italy

Angelo Porcelli

*Angelo Porcelli lives in Apulia, in southern Italy. His main interest is in geophytes suitable for this typical mediterranean climate. Over the years he has gathered a wide collection of most of the Italian geophytes, several of which are little known, visiting many of them in their native habitat.*

*He also grows South African species from the same mediterranean climate, as well as subtropical amaryllids of the genus Crinum and Hippeastrum. When he isn't enjoying his local flora, Angelo works as an engineer for a company operating in the renewable energy field.—Ed.*

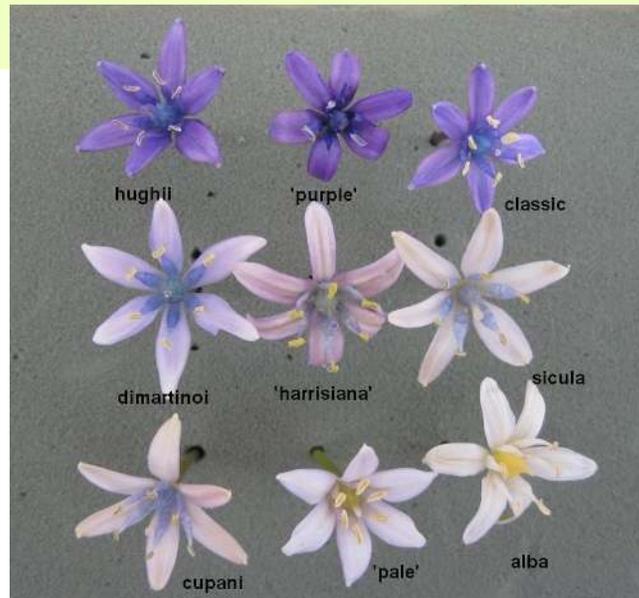
The genus *Oncostema* Speta has been reinstated based on molecular DNA evidence as well as karyological reasons, segregating it from the old and broadly defined genus *Scilla* L. There are also several morphological features of the vegetative parts such as large size of bulbs, leaves produced before anthesis with ciliate margins not always visible on all species with naked eye, and inflorescence structure made of solitary

scape with long bracts used as a basis for this decision. The genus as currently defined is composed of less than ten species with western Mediterranean distribution, starting from southern Italy through Sicily and its minor islands, to northern Africa and up to part of the Iberian Peninsula. Some species are endemic to restricted areas with small relict populations, but all the species have close affinity to *O. peruviana* so they are usually called the *peruviana* complex.

The spirit of this article should not be considered truly

scientific, as I am not entitled to do this, but rather as an introduction to the genus *Oncostema*. My main purpose is to illustrate some little known Italian species which are often confused, misunderstood or lumped into *O. peruviana*. Indeed, the University of Catania (Italy) has been studying the relationships among the species for the last several years and has published many manuscripts describing new species and clarifying their affinities. Ben Zonneveld of

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## *Narcissus* Pollination Ecology

Travis Owen

Travis Owen lives in semi-rural Rogue River in southwestern Oregon, with his wife Anna and two year old daughter Zia. His main interest is anthecology, the study of the relationships between plants and pollinators, particularly of Oregon native geophytes. Travis grows a wide spectrum of deer resistant plants, including many hardy Mediterranean geophytes, in his USDA zone 7 gardens. When he's not toiling in the garden (or at work, or most importantly spending time with his daughter), he is photographing plants (and their pollinators), blogging, or making custom furniture. Check out his blog here: [amateuranthecologist.blogspot.com](http://amateuranthecologist.blogspot.com).

The genus *Narcissus* is arguably one of the most iconic and recognizable insect pollinated plants in the world. Most of the attention goes towards the appearance of the flower, but little is given to the purpose of the form. What purpose does the corona serve? Why are the anthers of some species tightly constricted in the floral tube while those of others protrude out past the cup? What is the significance of pendent versus upward facing flowers? The answers to these questions and more can be clarified by illuminating the relationships between different groups of *Narcissus* and their pollinators. After all, the purpose of any flower is sexual -- to propagate the species and to facilitate adaptation to changing conditions through gene flow.

For those not familiar with the genus I offer this short description: With a few Autumn bloomers, *Narcissus* are mostly winter or spring blooming perennial bulbs from Portugal and Spain in the west, France in the north, southward into North Africa, and eastward into the Middle East. While the exact natural range is subject to debate (due to centuries of natural-

ization by ancient growers), the center of diversity for *Narcissus* is in the Iberian Peninsula. Species of *Narcissus* have been naturalized around the world from China to the U.K. and parts of the United States. All narcissi grow from true bulbs, having formed complete yet immature flowers within their bulbs during the preceding season. Most species are not self-compatible, and actually require outcrossing by way of insects.

Most *Narcissus* bloom at a time of year when there are adverse, unpredictable weather conditions, meaning that few pollinators are active. *Narcissus* overcome this first hurdle by having a relatively long bloom period of around two weeks, varying per species. The stigma reportedly remains receptive for most of the bloom period, while the anthers and pollen are subject to damage by wind or rain. Pendent flowers or those with concealed anthers are better adapted to avoid the impact of such weather.

Spencer C.H. Barrett, a notable researcher and professor in the Department of Ecology and Evolutionary Biology at the University of Toronto, has split the genus *Narcissus* into two main groups based on morphology and correlated pollinator preference. The "daffodil" type is characterized by a broad or extended corona, relatively short tube, and anthers within or beyond the corona. The flowers are often held horizontally or are pendant like *N. triandrus*. This type is best exploited by bees, mostly solitary *Anthophora* sp. and colony forming *Bombus* sp. Both are active early in the year and able to fly in somewhat inclement

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Left: *Narcissus* 'Thalia' with bumblebee. Right: *N. jonquilla* hybrid. Photos by Travis Owen.



## ***Narcissus* Pollination Ecology (cont'd)**

(continued from previous page)

weather by vibrating their flight muscles to generate the required warmth. *Apis* sp. (like honeybees), solitary *Andrena* sp., and various flies have also been known bee visitors of some species in their native lands. *Narcissus bujei*, *N. calcicola*, *N. hispanicus*, *N. longispathus* and *N. pseudonarcissus* are all examples of the “daffodil” type.

The “paperwhite” type is characterized by having a short flared corona, a long narrow tube, and anthers concealed in the tube. This type most often has flowers held horizontally or slightly upwards. These are best suited for Lepidoptera (moths and butterflies) rather than bees. Moths such as the diurnal hawkmoth *Macroglossum stellatarum*, are the most observed visitors to many species of *Narcissus* in Europe, and are the primary pollinators of many species. *Narcissus assoanus*, *N. dubius*, *N. papyraceus*, *N. poeticus* and *N. rupicola* are examples of the “paperwhite” form. Bees and flies occasionally visit species of this form, but are often morphologically unable to pollinate the flowers. Nocturnal moths have been suspected as pollinators of species such as *N. viridiflorus*, but no published observations have been made to date.

Form alone isn't always enough to lure the pollinators. One study on *Narcissus longispathus* (Herrera 1995) discovered a mini greenhouse effect created by the species' corona. There was an astonishing 10°F difference inside the corona (warmer closest to the anthers) when compared to the ambient air temperature out in the open. The temperature difference was enough to entice solitary *Anthophora* mining bees to enter the flowers for the pollen and nectar. *Anthophora* were shown to have the ability to generate heat when in flight, but not when landed, so the

warmth inside the flowers of *N. longispathus* enables them to stay warm enough to take off and fly to the next flower. It may be worth exploring an assumption that all “daffodil” types have this greenhouse effect, and that it evolved to entice bees to enter the flowers.

Scent is another way *Narcissus* attracts pollinators, though human noses are only occasionally able to detect the fragrance (on warm days). Based on the observed pollinators of a variety of *Narcissus* species, a clear Lepidoptera odor was identified in a study on the various fragrances produced by different species of *Narcissus* (Dobson, Arroyo, et al. 1997). *Narcissus assoanus*, *N. gladitanus*, *N. papyraceus*, and *N. serotinus* were all identified as having the ‘Lepidoptera’ odor, which interestingly often corresponds with the “paperwhite” form described above. By contrast, *N. bujei*, *N. bulbocodium*, and *N. triandrus*, which all have somewhat elongated open coronas and correspond to the “daffodil” form, lack the Lepidoptera odor and have not been observed being visited by moths or butterflies.

Many *Narcissus* seem to have obligatory rather than facultative mutualistic pollination systems in their native lands, in part due to the early blooming of many of the species, and the scarcity of active pollinators (relative to the spring and summer months) during the species bloom period. In the United States, the natural pollinators of *Narcissus* species are not present.

In my observations of pollinator activity and pollinator interest in *Narcissus* hybrids, the earliest blooming types are most attractive to pollinators. The generic yellow flowered trumpet daffodils, with large open coronas, seem to be the most attractive, mostly to bumblebees. The hybrid *N. 'Jetfire'* has also attracted bumblebees, possibly because of its early bloom time in my garden. Later in the season, bumblebees have been somewhat attracted to

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Left: *N. 'Jetfire'* with solitary bee. Right: fragrant jonquil with beetles.  
Photos by Travis Owen.



## ***Narcissus* Pollination Ecology (cont'd)**

(continued from page three)

*N.* 'Thalia', yet had absolutely no interest in the *jonquil* or *tazetta* types blooming nearby. Honeybees show occasional curiosity in *Narcissus*, but are generally uninterested.

Jonquils and tazettas (usually "paperwhite" forms) are completely neglected by all bees, with the exception of *N.* 'Hillstar', which has managed to attract exactly one tiny solitary bee for pollen. The strongly scented jonquil and tazetta types were instead of minor interest to small beetles and the occasional syrphid fly. The beetles seemed to be interested in the pollen of the tazetta hybrids, though they were only observed on a few occasions, yet were observed en masse. Some insects, like beetles, earwigs, and spiders are all common visitors to *Narcissus* in

my garden for shelter, and may serve a small role as pollen vectors, with the exception of the spiders who do not move between flowers often.

In closing, it is fascinating to me how the mechanisms employed by *Narcissus* to ensure pollination in their homelands are powerful enough to be mirrored, albeit mildly, even on a separate continent altogether. Different gardens in different regions will have different types of pollinators, different conditions, different cultivars, and different (non-*Narcissus*) plants also competing for pollinators. This will all most likely result in differing observations from my own. It is my hope that my observations and the observations of others of the genus *Narcissus* add a greater depth of beauty to this already treasured genus.



*Narcissus jonquilla* hybrid with beetle pollinators.  
Photos by Travis Owen.

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## The Unmanicured Lawn

Robin Hansen

Robin gardens in North Bend, Oregon just east of the Pacific Ocean on a property sheltered by dunes and conifers (slightly colder and hotter than USDA zone 9). She grows and sells Cyclamen and a few other Oregon native plants, primarily Erythronium, Trillium and other native bulbs. Robin was just elected President of the Southwest Chapter of the American Rhododendron Society. For any other questions or to request her plant list, send an email to [rob-in@hansennursery.com](mailto:rob-in@hansennursery.com).  
— Ed.

A country lawn, a wild garden - I can't really call my lawn either of these. A country lawn brings to mind mowing whatever you inherit with the property you buy. A wild garden mostly doesn't have grass or dandelions, but may be somewhat deliberately planted to resemble Mother Nature's designs.

My patch of lawn, on the other hand, has grass of uncertain heritage, moss, dandelions and now something much better. It is not an attempt to resemble Mother Nature. It only took forty years to come to the realization that I could do whatever I wanted, never mind other folks' ideas, preconceptions or opinions. And I don't have to face the rude or condescending attitudes of my neighbors; I only have one, and whatever I do to reclaim the horrible mess that was here when I moved in brings only compliments from them.

It all started with a fence which I had built as much for myself as for my dogs, most of whom have been or are in the 65-pound range. It's four feet high with wooden posts and top railing and hogwire, and because it completely surrounds the house, it has lots of room for dogs to roam and run and bark at passersby without totally intimidating them (yes, I want them intimidated, just not

too much.), as a way of protecting the house and as a refuge for all of us.

Somewhere along the way, I decided that since the lawn is flat, both front and back, and because I'm really tired of dandelions, handsome though they are, I should add some permanent color and variety of leaves to what was really a rather boring plot. Sorting out my cyclamen seed, a ritual I face reluctantly every year, became the

genesis of my advisedly willy-nilly approach. Seed dated up to six years ago was scattered here and there in fall and left to grow or not grow. Nothing happened for a few years, or at least not that I noticed. Then one day in early spring I happened to be doing my weekly dog duty when I realized I was seeing cyclamen leaves, small but definitely there. While English daisy (*Bellis perennis*) has been here since I moved in, *Prunella vulgaris* arrived in a nursery pot and was planted I don't remember where; two years later it was well-entrenched in the lawn and, unfortunately, in the rock garden. I could live with pulling it out of the rock garden, because prunella adapts incredibly well to living in mown lawns, continuing to bloom no matter how short it is. The *Prunella* may be a bit of a thug, but my hope is that it will compete with the dandelions and at least keep them from taking over completely.

Next I want to plant violets. There are four species that thrive in this climate, *Violas odorata*, *sempervirens*, *adunca* and *glabella*, and I want to introduce them all. Then, probably the last plant to be introduced, at least for now, is *Fragaria chilensis* or Beach Strawberry. This is another thug in its own right, but one  
(continued to page eight)



Above: *Cyclamen hederifolium* with English Daisy. Below: *Prunella vulgaris* mown close and still blooming. Photos by Robin Hansen.



*sempervirens*, *adunca* and *glabella*, and I want to introduce them all. Then, probably the last plant to be introduced, at least for now, is *Fragaria chilensis* or Beach Strawberry. This is another thug in its own right, but one

## Overview of the Species of the Genus *Oncostema* in Italy (cont'd)

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the University of Leiden in the Netherlands kindly offered to evaluate the nuclear DNA content of samples of plants in my collection, and what follows is a report on the results of that study.

A few words on *O. peruviana* (L.) Speta, a species well known in cultivation and a favourite for those in Mediterranean climates - I grow several chromatic variants, the classic blue, some darker forms, a purple violet one, a very pale blue that is almost white and the alba form. This species is diploid with basic chromosome number  $2n=14$  or  $16$ . Leaves are glossy green and smooth, and the ciliate margins are not easily visible without a magnifying lens.

*Oncostema hughii* (Tineo ex Guss.) Speta, is an endemic of Marettimo in the Aegadian Islands, which are west off the Sicilian coast. This species is occasionally present in collections, but in my experience, most of the time



it just turns out to be a form of *O. peruviana*. The true *O. hughii* differs based on the large size of the leaves, which are very wide, ra-

ther short, glossy green and purple-tinted on the lower side, the long pedicels of the florets that make



Above: *Oncostema peruviana harrisonia*.  
Below: *Oncostema hughii*. Photos by Angelo Porcelli.

the inflorescence look open, and the fresh florets set apart from the central cone with its long purple bracts, giving the inflorescence a

Saturn ring effect. It is said that the dark blue color is a diagnostic feature of the species, but I have

forms of *O. peruviana* which are even darker than *O. hughii*. *Oncostema hughii* is diploid with  $2n=16$  and is thought to be the most primitive species of the complex. The ciliate leaf margins are also visible.

*Oncostema sicula* (Tineo in Guss.) Speta, is surely the largest species of the genus. Its long leaves are rather erect and dull green with visible white ciliate margins; the big inflorescence composed of up to 300 florets makes it a very impressive plant when seen in full flower. In the early stage of anthesis, the inflorescence is almost flat, with many tight florets close to the central cone. Later, as the flowering progresses, the scape elongates and it easily reaches up to 40 cm. The florets have pale lilac tepals with bluish filaments on the anthers so the whole inflorescence appears at a distance to be a soft gray colour. It is present in scattered populations in a few locations in southern  
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## Overview of the Species of the Genus *Oncostema* in Italy (cont'd)

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Italy, but is a bit more abundant in Sicily and Malta.

*Oncostema dimartinoi* (Brullo & Pavone) F. Conti & Soldano, endemic of Lampedusa Island in the Sicilian Channel, is characterized based on the very short scape which bears the dense dome-shaped inflorescence at ground level and is composed of up to 50 florets of a peculiar pale blue colour, with almost white filaments. The anthers are



Above: *Oncostema dimartinoi*. Right: *Oncostema cupani*. Below: *Oncostema sicula*. Photos by Angelo Porcelli.



darker than *O. sicula* and contrast well with the tepals. This species is visually similar to *O. sicula* in the leaf stage, but is easily recognized when in flower. Both species are tetraploid with  $2n=28$ , with easily visible ciliate leaves of dull green; however, *O. sicula* is much larger.

*Oncostema cupani* (Guss.) Speta, is a smallish species, endemic to western Sicily, with a lax inflorescence of 20-30 florets of a caerulean-violet colour and with leaves hav-

ing finely ciliate margins. According to some Italian studies, this species is diploid with  $2n=14$ , but Ben Zonneveld's results show that it fits in a group with a higher DNA content. In any case, it is a distinct species related to the Tunisian endemic *O. maireana* (Brullo, Giusso & Terrasi) Speta.

Then there is the curious case of a form of *O. peruviana* wandering around under the name 'harrisiana'. It has no taxonomic validity, but the plant is distinct when observed. In leaf and size of inflorescence, it looks halfway between *O. peruviana* and *O. sicula*. The leaves are dull green and show a finely ciliate margin, but the pinkish-violet colour of the florets sets it apart at first glance. According to B. Zonneveld's analysis, this taxa is probably triploid, which leads me to guess that it is likely a hybrid between *O. peruviana* and *O. sicula*. So far, I haven't found any indication or locality data where this taxa has been recorded for the first time, in nature or in cultivation. As expected, this form is sterile but makes



bulbils on the roots; however, this feature of vegetative reproduction is common to all species of *Oncostema*.

The table on page eight shows the ploidy based on Ben Zonneveld's studies of my samples that I sent to him two separate times (labelled as "New" and "Old"). It is interesting to observe the different values for some new accessions I received from other countries (Morocco, Tunisia, Spain). Based on these results, some plants collected as *peruviana* could be different species altogether, so I prefer to name them as cf. *peruviana*. Some of them appear to be the true *O. peruviana* but others could be different species, morphologically close to *O. sicula* (i.e. *O. africana* (Borzi & Mattei) Speta), but they need to be better studied as currently no reasonable conclusion can be made from just a few samples.

Note: See more *Oncostema* photos from Angelo and other PBS members here: <http://www.pacificbulbsociety.org/pbswiki/index.php/Scilla>



**CHART: Overview of the Species of the Genus *Oncostema* in Italy**

Taxa	Locality	New	Old	Ploidy
<i>Scilla hughii</i>	Italy—Marettimo	30,6	33,8	2x=16
<i>Scilla peruviana</i>	Italy ex hort.	33,1	36,7	2x
<i>Scilla harrisiana</i>	Italy ex hort.	49,0	47,0	3x?
<i>Scilla cupani</i>	Italy—Sicily	49,3	50,5	3x?
<i>Scilla dimartinoi</i>	Italy—Lampedusa	63,5	67,0	4x
<i>Scilla sicula</i>	Italy—Sicily	no data	65,7	4x
<i>Scilla</i> cf. <i>peruviana</i>	Morocco 1	34,7		2x
<i>Scilla</i> cf. <i>peruviana</i>	Spain	34,8		2x
<i>Scilla</i> cf. <i>peruviana</i>	Tunisia 1	35,3		2x
<i>Scilla</i> cf. <i>peruviana</i>	Tunisia 2	50,3		3x?
<i>Scilla</i> cf. <i>peruviana</i>	Morocco 2	50,7		3x?
<i>Scilla</i> cf. <i>peruviana</i>	Morocco 3	60,9		

**The Unmanicured Lawn (cont'd)**

(continued from page five)

that is completely different from anything else in the lawn, having dark green glossy leaves and large white flowers. It withstands mowing, since in our sandy soil, with full sun and no water, it remains about one-half to one inch high.

While you might think that cyclamen would not withstand mowing, I'm now in my third year of seeing mature leaves.

The tubers are dormant in summer when I do most of my mowing and as they leaf out in fall, I simply set the mower blades higher. When I checked the patches of cyclamen after mowing the last time, I saw only two cut leaves.

Both *C. hederifolium* and *coum* are regularly blooming

now, and are easily avoided with the mower, as the leaves are pretty much flat to the soil and the flowers are up two to four inches.

I do not water the lawn,

weeds from the back lawn and I'm establishing a shade rock garden with Peter Cox's "Bird" Rhododendron hybrids, individual species cyclamen, wood rushes, small ferns, some small astilbes and other small perennials and shrubs. I'm leaving the moss in the shady areas of lawn over the septic tank to groundcovers only, and will add a broken concrete pathway to the back garden gate.

Satisfaction with benign neglect, reluctance to spend more time on lawns than necessary, and a tolerance for a moderate level of untidiness are essential to this sort of "lawn".

I've grown to love this area of my garden just as it is, a much improved version of the country lawn of my childhood, more diverse and colorful.



**Above: *Cyclamen coum* growing low. Below: Moss covering the shady areas of lawn. Photos by Robin Hansen.**



nor fertilize it, and I mow perhaps eight or ten times from early spring into late fall. I'm averse to mowing in general, so I removed the grass and

### Board of Directors Meeting, December 2014

Thanks to the herculean effort of Vice President John Wickham, PBS has finally become an official corporation with the State of California! PBS's official "birthday" was December 22, 2014. Next John will lead us through the non-profit process; he has formed a very special relationship with LegalZoom. This is an effort many, many years in the making, and we all owe John a huge "THANK YOU" for his hard work.

Treasurer Arnold Trachtenberg reported that the treasury remains healthy. We made our annual donation to Ibiblio, the host site for our forum, and we reimbursed John for the costs associated with establishing our non-profit status.

Although we have been grateful for President Nhu Nguyen's efforts as interim editor, the Board of Directors is very happy to announce that we have a new editor! Robin Hansen has agreed to take on this role. You all will show her your appreciation by volunteering in droves to write articles, right? We'd love to hear from you!

Wiki volunteer David Pilling administered a survey seeking feedback about the forum. The response was positive, with many people indicating that they saw no need for change. The most common request was for the ability to add pictures to listserv posts. Our tech team is working to respond to the few problems that were reported.

The SX/BX continues to run smoothly thanks to the efforts of Dell Sherk and Steve Marak, experiencing the usual seasonal slow downs and speed ups. Please donate!

Finally, as of this meeting, our membership was in the high 380s — and we appreciate every single one of you!



### Treasurer's Report, Year End 2014

<b>BALANCE 1/1/14</b>	<b>\$32,644.55</b>
<b>U.S. Members</b>	<b>\$3,020.00</b>
<b>Overseas Members</b>	<b>\$2,125.00</b>
<b>Contributions</b>	<b>\$153.00</b>
<b>BX Receipts</b>	<b>\$9,822.06</b>
<b>Investment results</b>	<b>\$3,849.26</b>
<b>TOTAL INCOME</b>	<b>\$18,969.32</b>
<b>BX/SX Postage</b>	<b>(\$3,816.28)</b>
<b>BX/SX Supplies</b>	<b>(751.70)</b>
<b>BX/SX Support Staff</b>	<b>(\$52.90)</b>
<b>Board Conference Calls</b>	<b>(\$244.25)</b>
<b>Treasurer's Supplies</b>	<b>(\$1,335.71)</b>
<b>Total Publications</b>	<b>(\$1,675.00)</b>
<b>PayPal Expense</b>	<b>(\$598.39)</b>
<b>Postage</b>	<b>(\$5,703.95)</b>
<b>IBIBLIO donation</b>	<b>(\$250.00)</b>
<b>Mary Sue Ittner Grant</b>	<b>(\$750.00)</b>
<b>TOTAL EXPENSES</b>	<b>(\$15,178.18)</b>
<b>BALANCE</b>	<b>\$36,435.69</b>

### PBS is on YouTube!

Explore all the videos of bulbs and bulb related topics. Watch time-lapse videos of bulb flowers captured by David Pilling or a tutorial on how to clean seeds by Gastil.

<https://www.youtube.com/user/PacificBulbSociety>

Become a contributor! Just open your smart phone and get started. What's blooming in your garden? A weekly update would be wonderful! We'd also appreciate in-depth tutorials such as mixing growing medium to planting amaryllid seeds. Wiki Director David Pilling will provide assistance to upload your video. It's that easy!



PacificBulbSociety uploaded a video 1 year ago



**Cleaning seeds**  
by PacificBulbSociety  
1 year ago • 45 views  
Gastil shows how to clean seeds

*PBS's Board of Directors is very pleased to announce that Robin Hansen has joined us as our new editor!*

*You already know her from columns like "The Garden Pot" (Summer 2013) and in this issue you will enjoy her musings on "The Unmanicured Lawn."*

*We're planning a double issue to get us back on track, so if you've got an idea for an article — maybe some great botanical tourism experiences? — now is the time to get in touch with Robin! [robin@hansennursery.com](mailto:robin@hansennursery.com)*

## Book Review: *The Genus Tulipa*

*The Genus Tulipa: Tulips of the World*, by Diana Everett. Kew, UK: Kew Publishing, 2013. Hardbound, x + 380 pp. Distributed in the USA by University of Chicago Press. US \$112. Available at a discount to Alpine Garden Society (UK) members at their online bookstore.

No task in the writing of reference works is more daunting than producing a book that will be satisfying to all readers, yet Diana Everett has nobly attempted it. Beautifully produced with color photos and botanical paintings throughout, augmented with a plant explorer's narrative and a chapter by laboratory botanists on an initial revision of the genus, as well as ample back matter (glossary, bibliography, a 23-page tabular synonymy, an alternative classification, sources, biographical notes, index). This is not the final word on *Tulipa*, but it is a fine compilation of present knowledge and opinion on the subject.

Everett is a distinguished botanical artist who has chosen *Tulipa* as her primary subject – even obsession. The 139 paintings are models of the genre, clearly depicting the plant habit and flower (interior and exterior), with details such as style, anther, capsule, and bulb. She painted many of them in the field in Central Asia, and others from plants in the collections of specialists (including her own) and botanic gardens. Many of the photos show the plants in habitat, infor-

mation useful to the grower. Some show various color forms of a species.

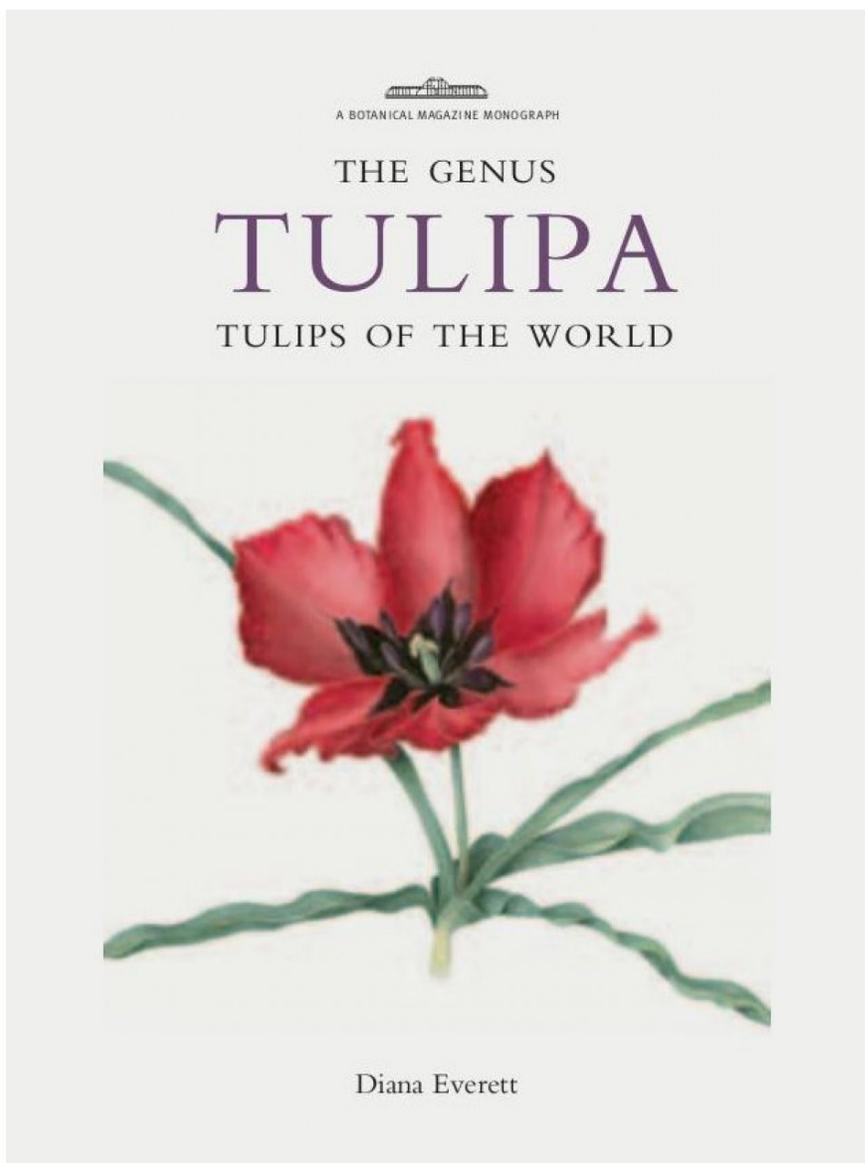
Each widely accepted name has an entry with a paragraph or two of discussion, taxonomic citation, synonymy, technical description, distribution, flowering period, and chromosome number. The descriptions are nicely balanced so that they can be understood by readers with only limited knowledge of botanical terminology, but also used to identify plants.

The chapter “Tulip Classification” is by Michael

F. Fay and Maarten J. M. Christenhusz (F&C) and presents a step toward a full revision of *Tulipa*, but not the final word: “Some species complexes still need further revision, and this may result in even fewer species being recognised. However, more evidence will need to be collected before these decisions are made; here we present an updated checklist of *Tulipa* species in which we accept 78 species (see page 36)” (p. 34). F&C identify four subgenera along with the Neo-tulipae groups of naturalized hybrids. The chapter also includes a phylogenetic tree for 25 *Tulipa* taxa based on DNA analyses; it supports

their subgeneric classification and also shows that *Amana*, sometimes included in *Tulipa*, is more distant from it than are the Old World *Erythronium* species. (This made me wonder where the eastern American *Erythronium* would fall, and how distant the western

*(continued to next page)*



## Book Review: *The Genus Tulipa* (cont'd)

(continued from previous page) ones would prove.) F&C have thus significantly reduced the number of species recognized by, in particular, botanists of the former USSR; they also express some doubt about the sectional splits proposed by Ben Zonneveld, based on a different method of cellular study.

Everett and the editors (notably Martyn Rix) thus faced the problem

of deciding which entities to treat separately. Their solution is as much a hybrid as a lot of tulips appear to be. The entries are organized first under the subgenera recognized by

F&C. Each group of entries is headed by a species recognized by F&C or, at any rate, one that they have not yet submerged. Within this group, however, there are regular entries for species named in other treatments. Thus, we have the entries *Tulipa clusiana* and a couple of formae, followed by entries for *T. aitchisonii* var. *clusianoides*, *T. chitralensis*, and *T. greywilsonii*, each with the note “(synonym of *T. clusiana*)” following the heading. To further orient the user, a running head specifies that *T. clusiana* is the recognized species here. The introductory paragraphs in

each entry discuss the history of the name and whatever disagreement has attended it. If the reader understands this format and why it was adopted, it is useful, but it is not clearly enough discussed in the volume’s preface.

*Tulipa* is not one of the genera favored by many PBS members, but those of us who have ventured into it will want this book despite its well-merited cost. It may also encourage

ing predators (hydroponic plastic mesh pots are good for this) and from grazers such as deer and rabbits. Most of them prefer dry summers, but like most spring bulbs – especially those that flower following snow melt – they tolerate quite a lot of moisture while in growth.

Brilliant color and variety, and a list of at least 78 species and probably more! How can we resist? I did-

n’t: about 35 of Vickery’s seed offerings are in their second year in my seedling house, and I’m faced with the decision of where to move them this summer.



others to grow these lovely bulbs. Everett’s careful documentation of wild habitats will help, as will the seed lists of Kurt Vickery (one of Everett’s advisors), who offers wild-collected seed of many species. Growing your tulips from seed produces healthy stock and is not difficult: the seedlings emerge the first year and can be moved on after two years in their seed pots. Mature plants can be grown outdoors in much of North America, given excellent drainage, and not all require as much winter chill as Dutch hybrid tulips do. They must be protected from burrow-

Will the rock garden turn into Central Asia, with tulips scattered among the shrubby penstemons and daphnes? Should the tulips partner with the species peonies? Or do I call in the landscaping crew to build a systematic bed beyond the bulb house, which is now filled to capacity? In the meantime, I can enjoy the dozen or so tulips I’ve grown from seed since the mid-1990s, and attempt to verify their labels with the help of Everett’s magnificent work.

Reviewed by Jane McGary, Portland, Oregon, USA



## Gardening with Bulbs



Angelo Porcelli describes the Italian environment in which *Oncostema* thrive in this issue. Above: *Oncostema dimartinoi*, photo by Angelo Porcelli.

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*The Bulb Garden* © 2015

*The Bulb Garden* is the newsletter of the Pacific Bulb Society (PBS). It is published, if enough articles are submitted, around the third week of each quarter and is available to PBS members. This newsletter provides gardening or bulb related articles, news of interest to members, and announcements of the PBS organization.

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