

# International Rock Gardener

ISSN 2053-7557



Number 93 The Scottish Rock Garden Club September 2017

# ---International Rock Gardener---

September 2017



What a wonderful season – in the south spring is in full flower while in the north we move into the golden time of coloured leaves, fruiting plants and autumn flowers and bulbs cheering the prospect of winter to come.

The IRG is pleased to publish the description of a new *Tulipa* species by J.J. de Groot and K.S. Tojibaev, which is named to honour Dr Ben J. M. Zonneveld.

The coming season seems like a good time to think about some projects that one may undertake to make some new planting places for a garden, of whatever size or situation. Jan Tholhuijsen takes inspiration from the various trough types promoted by Ian Young and our resourceful friend has devised another method to

make lightweight planters. These make excellent alpine troughs, of course but their use can be appreciated by anyone seeking a planter which can be moved quite easily to any position and used for anything from cuttings, making a child's first garden, planted with herbs or the rarest alpiners. No wonder the original fish box troughs have had such success wherever they have been shown and demonstrated! Jan's new method is something that can give rein to your own preferences and is easy to follow.

Zdeněk Zvolánek is a fan of fabaceae for the garden and describes some garden friendly dwarf shrubs from this family.

There are groups of cactus and succulents growers in just about every country - such is the attraction of these plants.

Many cacti are more hardy than one might imagine and these are not only useful subjects for a xeric garden but also becoming more popular plants even in UK gardens, with more people trying hardy species outside or growing plants for exhibition for SRGC and AGS shows.

[Kenton J. Seth](#), garden maker, [blogger](#) and long-time cactus enthusiast reviews a new book on these spiky plants, and associated items. Kenton, a deservedly popular speaker, was recently the star attraction for the SRGC Summer Event – all reports about this talented plantsman and communicator are favourable and give hope for the future of horticulturalists spreading enthusiasm for plants and ecology.

Cover photo: *Eriogonum sphaerocephalum* and *Genista carinalis*, photo Zdeněk Zvolánek.

## ---Garden Project---



Little cement troughs from a workshop by Ian Young

Jan Tholhuijsen explains that his inspiration for lightweight troughs has come from the fish box troughs of Ian Young. "One

can say two ideas, both with the basis of a polystyrene core. With pleasure I also copied the fish box troughs from Ian. For people who do not know this way of troughs, I give a couple of links from Ian's creations and his clear instruction."

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Links to some of Ian Young's trough articles:

<http://www.srgc.org.uk/bulblog/log2008/170908/log.html>

[http://www.srgc.org.uk/logs/logdir/2015Jun031433327631BULB\\_LOG\\_2215.pdf](http://www.srgc.org.uk/logs/logdir/2015Jun031433327631BULB_LOG_2215.pdf)

[http://www.srgc.org.uk/logs/logdir/2015Jun171434531125BULB\\_LOG\\_2415.pdf](http://www.srgc.org.uk/logs/logdir/2015Jun171434531125BULB_LOG_2415.pdf)

[http://www.srgc.org.uk/logs/logdir/2009Nov181258556803BULB\\_LOG\\_46\\_comp.pdf](http://www.srgc.org.uk/logs/logdir/2009Nov181258556803BULB_LOG_46_comp.pdf)

Or the total package of the links above the Ebook <https://tinyurl.com/lansfishboxtroughs>

However you make such troughs, they make an attractive addition to any garden and a good home for all sorts of alpine – and other – plants. Instructions for the new method of Jan Tholhuijsen follow.

## The lightweight trough – text and photos by Jan Tholhuijsen



Extruded polystyrene, or XPS, is the material I use for this project. For sale in any good hardware store. 5 cm thick. A pack, 8 plates (sheets) 125-60-5 cm costs between € 40 - € 45. With this amount you can make three or four troughs, depending on the size. STYRISOL is a brand name.

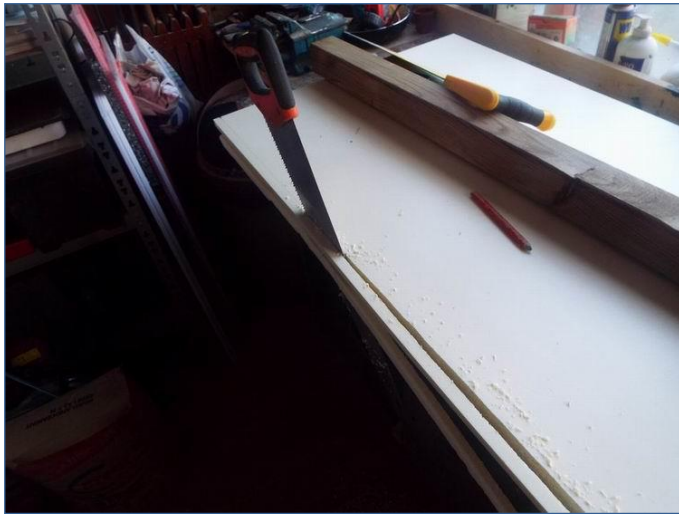


XPS Extruded polystyrene, is not to be confused with EPS Expanded polystyrene. The advantage of XPS above EPS is, inter alia, that it has a higher compressive strength, and a closed cell structure, which makes it less sensitive to water absorption.

Additional requirements: Adhesive paste for XPS (The glue should be for outdoor use).  
Portland cement. Peat. 6 tea towels or any other cotton cloths of that size. Long screws.



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Left: First cut off the slot and feather (where the sheets would slot together).

Measurements for this trough (of course you can choose a different size)

The bottom plate is 100-40 cm.

Below: Make the long and short sides, the height that you wish while trying not to waste material. (About 18-19 cm height)

Apply adhesive now to the long and short sides to join them together. Only spray the adhesive on one side. Press down the adhesive with a sliding movement across each other.

Make the bottom plate ready for the connection to the sides. After 24 hours the glue will be stronger than the plate.



Also, again press with sliding movement to each other. I used long screws for the sides, (below right) but the next day they can be removed to re-use.



With a round hole saw make 2 drainage holes of 6-7 cm diameter. Why such large holes? I want to do it with two holes, because I want to support the trough

in three places, two on the sides and one in the middle. But you can do it differently. Maybe I'll make the next one with 3 holes and support in two places.

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Now I have used some waste pieces to make the top wavy, to replicate worn areas, but you may leave the edge. Next time I may do that.



The next task is the roughening of the outside and inside. The flat surfaces are very smooth, and in order to get a good connection with the cement it is necessary to “key” the surface. You can do this with very coarse sandpaper; but I do it with a serrated sanding / cutting machine. Ian Young uses a wire brush.

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For covering I use tea towels. I cut off the edges of these in order to mask the transition between the cloths. For a trough of the stated dimensions you use six towels.



Next task is to coat the base with thin cement 'porridge' with a brush. This is in order to improve the adhesion.



Below: the coating begins, trough is shaped and undercoated.



Now comes the most difficult chore.

The cloths must be soaked with the slurry of cement and peat. First wet the cloths with water and wring them out so that they retain some moisture, for better absorption of the slurry. Composition of the mixture: for this trough 8x half a litre of cement and 2x half a litre of peat and 2x half litre masonry sand. I use a measuring cup of this size. Make the mix to the fluidity of yoghurt. Immerse the cloths well in the mix there until they are well soaked. Wear gloves !! That really is important.



Dampened cloths



Rubber gloves



Cement Slurry

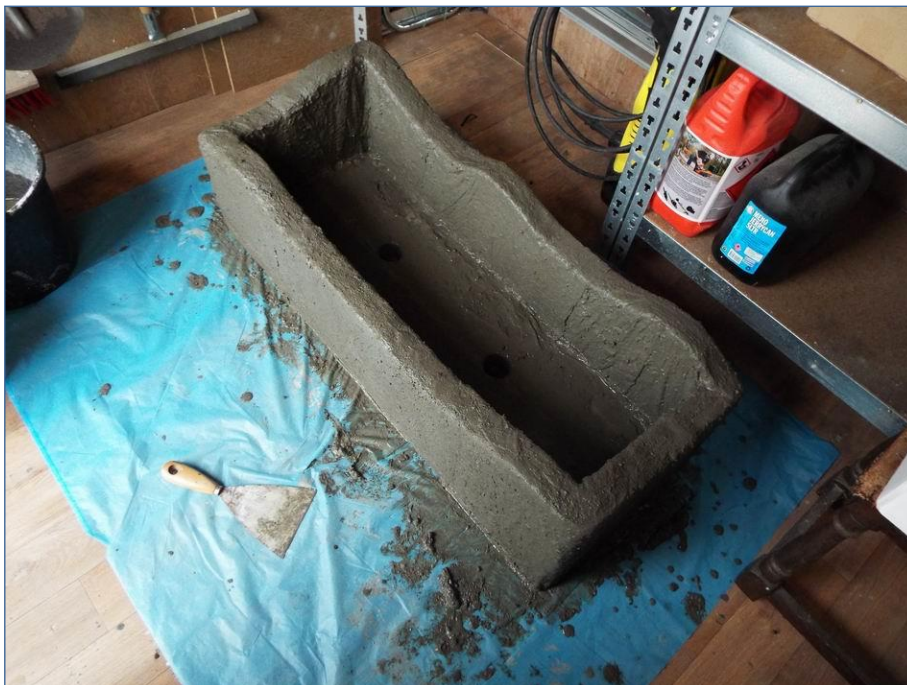
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This photo is of my 3 metre trough, but the principle is the same. Place the soaked cloth from the outside over the edge to the inside of the trough. Make sure the cloth hangs exactly flush with the bottom on the outside. Start on a corner, which will help reinforce the trough.

Below left: With a little wet paint roller you can apply additional pressure to the cloth.

Below right: Take the remaining slurry and create a layer on the bottom where there is no cloth. The next day you make a paste of cement and edit the underside, especially at the corners of the trough with the linen cloths to strengthen this area.



Allow trough to dry and cure for a few weeks, this will make let any chemicals dissipate. Then you can fill it with your own mixture and creations.

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Jan shows how light the finished trough is - this trough weighs 15 kg; it is easily moved into place.



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## Sequel 1

Some pictures of another version of lightweight trough; the second trough under construction with some adjustments. The sides are 30 cm height now, and the wave I saw out with a jigsaw. The rounding at the corners goes well with a jigsaw. Then update it with coarse sandpaper. It's fantastic to work with XPS, but it does make a bad mess in the workplace.



Now, the base designed for a trough of 125 cm long. Now I have an idea how many troughs I can make from a pack of 8 plates XPS. (125-60-5 cm) Three plates makes two troughs of 100cm. I kept over a strip of 10 cm. 2 plates make 1 trough of 125 cm. Now, 3 plates remain: I can still make a trough of 175 cm. The width of all is 40 cm and height 30 cm.



In photo above – Right; the first trough, centre; the second one metre trough after the first layer of cement paste for better adhesion, and at left; the 125 cm base. The adhesive bond is stronger than the plate.

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## Sequel 2

The 175 cm trough - the form is finished. The 125 cm size is sanded. The 100 cm size is undercoated.



Above: the remnants of the package of XPS.



There are now four troughs: 2 x 100cm, 1 x 125 cm and 1 x 175 cm. Photo above right shows the structure on the outside of the finished trough.

**Video showing my method:** [Click here for the video of the process.](#)

To recap:

This time I get the trough on the workbench, normally on the floor is easier but there is not enough light on the floor for filming.

Covering the trough with the soaked cotton cloths (tea towels) is not difficult, but requires some skill and knowledge. Therefore, I hope this video will help.

First, with a brush, "paint" the trough fully with a cement "porridge". This is to assist the bond the coating to the (tea) cloths.

Wearing good, protective gloves, moisten the cotton tea towels and soak/coat them well with cement porridge. Make sure the bottom of the trough on the outside is flush with the bottom of the cloth.

With any remaining cement porridge, coat the bottom of the trough.

After 2 days you are able to restore / repair the exterior of the trough with cement porridge on any bad pieces.

After 3 days I again coat the outside with a thin "gruel" or "porridge" of cement.

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When the trough is dry, turn the trough over and smear the outer base with a layer of a half a centimetre of cement paste. This has to be a thicker paste so that it does not flow. The coating achieved with these paintings is very strong. My 3 metre trough was lined with this method and now has now been through a second winter – you can see a video of that trough [here](#).

Anyone can create a trough in this way. If you are anxious about the winter you can insert bubble wrap against the inner sides.

### Sequel 3

This time a little more about the finish after the base with the tea towels is ready.

Right: cement porridge for final fix

It may be that the tea towels have included less cement porridge in places; you add the extra quantity in those places with cement porridge and a brush. Then coat the whole trough again with the cement porridge to soften the sharp edges. At the foot it is possible that at the corners, the tea towels have not stuck well, I fix this with some glue paste. Then cover the base with a thicker cement paste of half a centimetre and smooth over. Then dry again.



Far left: corners not well adhered.

Left: use of glue paste on under edges.

Below: a finished trough, drying out.



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## Sequel 4

The final results of the 125 cm trough.

Trough put outside for further curing. By my experience with the 3m trough, I know that the wall of the trough is very strong and hard. Still, I'm surprised every time. The strong cement mix gives this result. As well as the structure I am very satisfied with, it gives from the start an old look, which only gets better.

Just one small calculation  
Base form 125-40-5.5 cm =  
27500 cubic cm

2 long sides 125-30-5.5cm =  
41250 cubic cm

2 short side 30-30- 5.5 cm =  
9900 cubic cm

Together 78650 cubic cm

Concrete is originally a mineral substance and the specific weight of dry compacted concrete is 2400 kg / m<sup>3</sup> (this equates to 2.4 g / cm<sup>3</sup>)

78650 cubic cm x 2.4 = 188  
760

If such a trough had been made of concrete with some armament, it would therefore be between about 180 and 190 kg. The lightweight version weighs just 20kg.



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## Sequel 5

I wanted to create a trough of 175 cm, but that is too big for my small workshop. I must make them outside; I'll do better next spring.

I compromised by "cutting the trough in half" and made two of 87 cm. I had enough pieces to close the ends and I still had enough glue. I made the first rough corners with the jigsaw then finished with sandpaper.

I want to really emphasize how important it is to make all surfaces rough, because the default is a very smooth finish, and a rough surface to key for good adhesion of the cement is necessary !

There are countless possibilities for the design and how big you make it. It's great material to work with.



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## Sequel 6

The fourth trough I made, the cloths that I used were pure cotton but a rigid structure. My wife had used them and they were old and I thought to try them. They did not work well. They were not flexible enough to fold nicely into the corners – see below.



One could use such “stiff” cloths but it is better to use soft cotton or old T shirts (cut the sleeves off). Even when nylon is used in the material, it does not matter. So long as it is supple and not too thick.

I completed the fifth trough in December. I was impatient for the spring, when I could design their landscape and plant them up.

The troughs spent a few months outside to allow the cement to neutralize. The destination in the garden was already known. In spring I got them all set up and planted. It was a very fun project, if you want to make big troughs, this is THE way.



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In 2017- all placed and planted – the plants are rooting well, there have been just two failures.

Plants in first 85 cm trough (above)

*Daphne x susannae* 'Tage Lundell'  
*Daphne laureola* subsp. philippi  
*Picea abies* 'Vysluni'  
*Primula marginata*  
*Primula minima* 'Alba'  
*Primula* 'Blindsee'

*Primula glaucescens*  
*Sagina subulata* 'Aurea'  
*Saxifraga* aff. *duthei* or 'Speulderbos'  
*Saxifraga x irvingii* 'Timmy Foster'  
*Saxifraga oppositifolia* 'Florissa'

Plants in first 100 cm trough (below)

*Abies koreana* 'Kohouts Hexe'  
*Daphne cneorum* 'Blackthorn Triumph'  
*Gentiana albarosea*  
*Primula auricula* 'Mariandl'  
*Primula allionii* 'Anicka'  
*Primula recubariensis*

*Primula allionii* 'Helios'  
*Primula grignensis*  
*Saxifraga oppositifolia* -roofseedling- 10-2001 G. Hoek  
*Saxifraga oppositifolia* 'Dr Jenken'  
*Hedera helix* 'Dyinni'



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Plants in second 85 cm trough  
*Androsace hausmannii*  
*Edraianthus zogovicii*  
*Iris reichenbachii*  
*Junellia micrantha* synonym *J. wilczekii*  
*Phlox bifida* 'Ralph Haywood'  
*Pinus mugo* 'Bozi Dar'  
*Rosularia serpentinica*  
*Sagina subulata* 'Rucos'  
*Saxifraga karadzicensis*  
*Saxifraga paniculata* 'Multipunctata'  
*Saxifraga paniculata* 'Picos'  
 A. Young wild collected in the Picos.  
*Saxifraga callosa* var. *australis*  
 'Superba'  
*Sedum davisii*  
*Silene scopulorum*  
 4 x *Gentiana* sp. various colours.

Plants in 125 cm trough  
*Androsace studiosorum*  
*Arenaria tetraquetra*  
*Arenaria purpurascens*  
*Edraianthus dinaricus*  
*Junellia azorelloides*  
*Myosotis pulvinaris*  
*Phlox caespitosa* 'Zigeunerblut'  
*Pinus mugo* 'Brokolice'  
*Raoulia australis*  
*Raoulia glabra*  
*Raoulia hookeri*  
*Sagina subulata* 'Aurea'  
*Scleranthus uniflorus* 'Olive'  
*Silene araratica*  
*Saxifraga longifolia*



175 cm trough – plants listed below.



## ---International Rock Gardener---

Plants in 175 cm trough (above)

*Buxus microphylla* 'Curly Locks'  
*Daphne x susannae* 'Cheriton'  
*Daphne schlyteri* 'Golias'  
*Daphne arbuscula x Daphne sericea*

*Gentiana kaufmanniana*  
*Gentiana angustifolia* 'Iceberg'  
*Gentiana clusii* 'Alboviolacea'  
*Sagina subulata* 'Senior'  
*Saxifraga* 'Albert's Yellow'

*Scleranthus uniflorus* 'Olive'  
 2 *Gentiana* sp. and 4 *G. verna*,  
 different colours from seed.



Plants in second 100 cm trough (above)

*Allium* aff. *stenodon*  
*Daphne cneorum* 'Pygmaea Alba'  
*Daphne gemmata* new from  
 Vladimir Valenta  
*Dianthus pavonius*  
*Leontopodium nanum*

*Phedimus* syn. *Sedum*  
*middendorffianum*  
*Phlox subulata* 'McDaniels  
 Cushion'  
*Pinus mugo* 'Hobl'  
*Primula forrestii*

*Primula glaucescens x minima*  
*Thymus praecox* 'Coccineus'  
*Saxifraga longifolia*  
 2 *Gentiana verna* & 1 *Gentiana* sp  
 all from seed



Plants in 2 x 80 cm troughs (above)

*Allium olympicum*  
*Campanula dzaaku*  
*Crassula setulosa*  
*Daphne x susannae* 'Ceska  
 Rybna'  
*Daphne x hendersonii* 'Verunka'  
*Delosperma basuticum* 'White  
 Form'

*Erigeron linearis*  
*Iris attica*  
*Oxytropis megalantha*  
*Oxytropis jacquinii*  
*Paraquilegia grandiflora*  
*Pinus mugo* 'Exellence'  
*Pinus mugo* 'David'  
*Pinus mugo* 'Leucolike'

*Raoulia australis*  
*Sagina subulata* 'Aurea'  
*Salix reticulata* (ex Alaska)  
*Sedum sediforme*  
*Taxus baccata* 'David'

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After finishing the 5 troughs I bought another pack of XSP and made the trough table and the 175 cm trough and the two of 80 cm. Total now 7 lightweight troughs.



Table with set-in lightweight trough

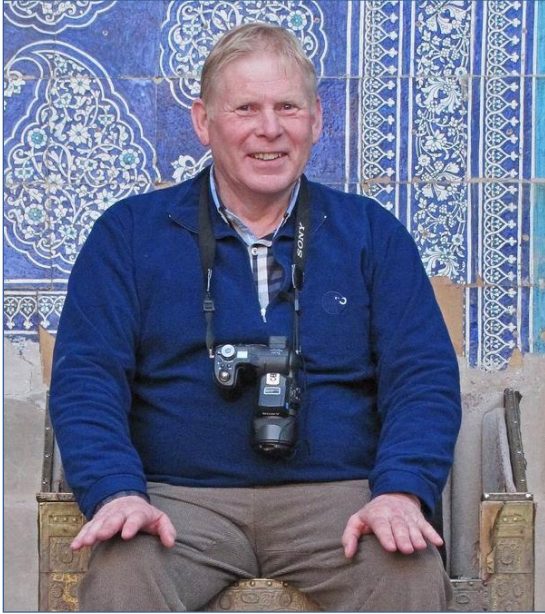
Below: Most troughs are finished with old slate tiles that I could purchase for one euro each. When breaking and shaping, many splinters and small pieces are available, which are beautiful to use for sprinkling as top-dressing for the troughs. J. T.

Please email Jan Tholhuijsen via [jtmt@gmail.com](mailto:jtmt@gmail.com) if you have any questions about these projects.

You may access full details for many other projects by Jan from [this page](#). Jan is most generous in sharing all his clever constructions and advice with us.



## ---International Rock Gardener---



### Introducing a new IRG contributor: J.J. (Sjaak) De Groot

I will introduce myself for the people who don't know me. My name is Sjaak de Groot, I was born in the middle of the last century in the bulb district of Holland. My father runs a nursery of bulbs and cut flowers, later my brother and I took the nursery over and concentrated on cut flowers, and changed from a mixed nursery with flowers outside and in greenhouses to a monoculture of cymbidium (Orchids) under glass, over almost 40 years. This give me as a bulb lover the possibility to keep bulbs as a hobby, as most of the work in cymbidium comes at the time that the bulbs are in the ground. From the beginning of this century I have travelled every spring to the natural growing places of tulips, and now I can say I have seen most species in their original environment. I am associated with the website ['Tulips in the Wild'](#) where you can see a number of my photographs.

At first I liked to grow every plant that have a corm or bulb, but after retirement I have concentrated on my growing collection of tulip species. Right now I am "busy" with writing a book about this genus, based on my own experience combined with the original descriptions of the species, which shows that there is a lot of confusion in the naming of the tulips today, with several good species lumped under other species and others with names that don't fit with the original description, and several without a name. I hope to finish this job before my time on this world is over.

The photo shows me sitting on a throne that looks out over the central square of Kiva (Uzbekistan). Used, I suppose, by the Sultan to spectate at all kind of events in bygone days.

## ---Species Description---

### **Tulipa zonneveldii ( Liliaceae), A new species from the eastern Chatkal Mountains of Kyrgyzstan. J.J. DE GROOT & K.S. TOJIBAEV.**

Published in IRG - International Rock Gardener #93 - September 2017

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#### **Abstract**

*Tulipa zonneveldii* sp. nov., with a genome size (Zonneveld 2009), of 2C 49.9 pg. is described and provided with photos. The type form G 011-8, is in the collection of J.J. de Groot and represents the most common form of the wild population.

Key words: Liliaceae, Tulipeae, Tulipa.

#### **Introduction**

The genus *Tulipa* Linneus (1753:305) ( Liliaceae), includes 87 species, (Zonneveld 2009), 78 species, (Christenhusz et al 2013), or 83 species (WCSP 2016 Kew). The real number of species "including the genus *Amana* Honda", is estimated to be 150, as several good species are regarded as synonyms, and new species will be recognized and described as well. Comparison of samples in

## ---International Rock Gardener---

the collection of J.J.de Groot (more than 800 accessions) and their nuclear DNA values, as well the new descriptions appearing yearly, endorse this argument.

During our yearly travels to the natural growing places of tulips, in 2011 and 2012 we (J.J. de Groot, W. Lemmers, G. Lazkov, D. Everett and R. Steele), explored the mountains around the Fergana valley in Kyrgyzstan to see as many places as we could find where *Tulipa ferganica* Vved. and other tulips known from that area were to be found. Growing beside the road to Sary-Chelek near the village of Arkit, we came across a population of yellow tulips. On first glance we believed them to be *T. ferganica*, but the habitat was different from that of all the other populations of this tulip. Whilst all the populations of *T. ferganica* which we had previously visited grew on open hill slopes, these tulips were growing among shrubs in partly shaded terrain. The colour of these tulips was also different from all previous *T. ferganica* we had seen.

*Tulipa zonneveldii* J.J. de Groot & K. Tojibaev sp. nov. TYPE: clonal stock G011-8, originated from a few wild collected bulbs from the only known growing place, and is found in West Kyrgyzstan in the Arkit forest near the village of Arkit in the eastern Chatkal range of the Tien Shan 41.46.06.68 N, 71.58.04.10 E, on an elevation of 1170 m, where it grows on gravel rich soil, (photo 2), on the basis of a 400 m high scree. Growing nearby, but on a sandy soil, are *Tulipa anadroma* Botschantz., and *Iris (juno) zenaidae* (Vved.) F.O. Khass. & Rakhimova.

The type form ( holotype) of cultivated plants G011-8, from the collection of J.J. de Groot is in the National Herbarium Netherlands - nr. L3971774.

### Diagnosis

*T. zonneveldii* is a bulbous plant with a pear-shaped bulb, up to 20mm diameter, with a brown tunic covered inside with short hairs on top and bottom. It has a stoloniferous habit growing to a depth of 10cm.

The aerial part of the stem 1 (5), including the flower stem is 5-15cm long upright, reddish in colour and covered with short bristly hairs. It has 6 glaucous green leaves, 12-8.2cm long, and 2.5-1cm wide, spear shaped and keeled; the strongly-waved margins are covered with short hairs, there are no hairs on the upper surface of the leaves. The lowest 4 leaves form a rosette on the soil surface with the attachment to the stem below the surface; the 2 (1) stem leaves are based just above the soil surface. The flowers 1 (2-5), have ovate outer tepals tapering to a point 57 x 14mm, greenish-grey to pale reddish with broad pale yellow margins outside. The inner tepals are oval, tapering to a point 59 x 15mm, pale yellow outside. All the tepals are bright light yellow inside. The stamens are unequal in length 17 - 19mm. long, including narrow triangular filaments of 10mm long, the filaments are pale yellow, darker at the top; the anthers and pollen are pale yellow. The ovary is bottle shaped 14mm, long, pale green with a pale yellow base. The stigma is pale yellow with slightly protruding lobes. The flowers have a faint pleasant smell. Flowering time in nature and in cultivation is in the second half of April.

*T. zonneveldii* differs from dwarf forms of *T. ferganica* Vved. by the bright light yellow of the inside of the flowers, golden yellow in *T. ferganica*; the pale coloured centre of the outside of the outer tepals, brighter red in *T. ferganica*; the number of leaves 6, commonly 3 - 4 in *T. ferganica*; the seedpod with a short beak instead of a flat top as in *T. ferganica*. The leaves have a hairless upper surface, hairy (at least the top leaves) in *T. ferganica*. The narrow filaments are triangular, whilst all the *T. ferganica* forms have ovate filaments. In cultivation, the plants of *T. zonneveldii* are half the size of the smallest forms of *T. ferganica*.

The most important feature is the much higher value of DNA 49.9 pg in *T. zonneveldii*, which placed this new described tulip outside the section *Kolpakowskianae* Raamsd. ex Zonn. & Veldk. (DNA value 36.4 - 44.9 pg.), the DNA of *T. ferganica* being up to 44.8 pg.

# ---International Rock Gardener---

The only other tulip with similarity to *T. zonneveldii* is an undescribed yellow dwarf tulip from the higher levels of the Kurama mountain range in Uzbekistan, related to *T. vvedenskyi* Botschantz., but this tulip has a longer stem, only 4 leaves, and a higher DNA value than *T. zonneveldii* of 51.5 pg.

The variation of *T. zonneveldii* in the natural population is its mostly single-flowering characteristic, with a minority of plants multi-flowering up to 5 flowers, the form and size of the tepals, and the colour of the outside of the outer tepals, which varies from pale greenish-yellow to reddish. This newly recognized tulip was formerly placed under *T. ferganica* by both Botschantzeva - *Tulips*, and Everett - *the genus Tulipa*, but research by Dr. B.J.M Zonneveld of the DNA value shows this tulip with a DNA value of 49.9 pg. is far from *T. ferganica*, with 44.8 pg; this is almost the highest level in the Kolpakowskianae, therefore this tulip, despite its more or less *T. ferganica* appearance, can no longer be included under this species and can better be seen as a remaining species from a group of tulips that evolved from an ancestral *T. ferganica*, to the tulips that possibly, via hybridizing with tulips like *T. micheliana* Hoog, formed the basis of the Vinistriatae/ *Spiranthera* Vved. ex Zonn. & Veldk. (DNA value 50.9 - 54.7 pg.) section of tulips.

*Tulipa zonneveldii* is named to honour Dr. Ben J.M. Zonneveld, of the NBC Naturalis, Section [National Herbarium of The Netherlands](#), Leiden, for research on the [nuclear genome size](#) of “all” *Tulipa* species.

Table 1. Comparison of *Tulipa zonneveldii* with “related” species

	<i>T. zonneveldii</i>	<i>T. ferganica</i>	<i>T. aff. vvedenskyi</i>
Bulb	pear shaped	round	round
Bulb tunic	hard, dark brown	coriaceous, grey brown	papery, brown
Stems	1 (5) covered with short hairs	1 (7) covered with short hairs	1 covered with short hairs
Leaves by single Flowered plants	6 (5) close together almost as a rosette on soil level	3 (4) placed with some distance on the lower half of the stem	4 as a rosette on soil level
Hairs on the leaf Margins	yes	yes	no
Hairs on the upper leaf surface	no	yes	no
Flower colour	light yellow, with pale reddish or greenish centres of the outside of the outer tepals	yellow, with reddish or red centres of the outside of the outer tepals	yellow, with pinkish grey centres of the outside of the outer tepals and pale greenish grey veins on the outside of the inner tepals
Filaments	narrow triangular	ovate tapered to a point	narrow triangular
Seedpods	with a short beak	with a flat top	with a short beak
Genome size 2C pg	49.9	38 -44.8	50.5

Photos: 1A bulb, 1B seedpod, 1C seeds, 1D floral parts, on mm grid.

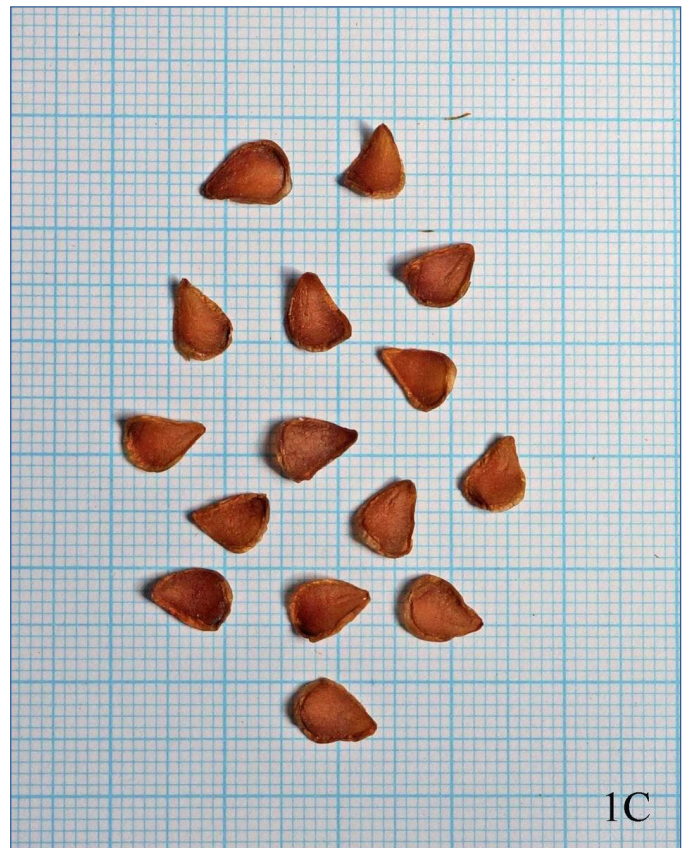
Photo 2: from the wild on type location.

All photos made by J.J. de Groot.

# ---International Rock Gardener---



*Tulipa zonneveldii* - bulbs and tunics, seedpod and seeds.



# ---International Rock Gardener---



*Tulipa zonneveldii* – floral parts



*Tulipa zonneveldii* in type location.

# ---International Rock Gardener---

## Acknowledgements

The authors would like to thank Dr. B.J.M. Zonneveld for his research to the DNA value and J. van Scheepen, D. Everett and W. Lemmers for careful reading of the manuscript.

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Dr. Ben J.M. Zonneveld at work preparing DNA samples



# ---International Rock Gardener---

---In the garden---

## Dwarf Fabaceae Shrubs – text by Zdeněk Zvolánek

(Photos by ZZ unless otherwise stated).

There are half a dozen genera with pea flowers which are suitable for small gardens. Nearly all have no demand for watering and all love sunny, dryish warm places with a sandy and alkaline mineral soil. I will write first about dwarf brooms, shrubs from the genus **Genista**. All have yellow flowers in dense inflorescences, and small linear leaves on green wiry branches. The flowering time is in May and June and usually no seed is produced in gardens, so propagation is relatively easy by rooting half ripened cuttings with the help of a stimulating hormone powder. *Genista* quickly develop a long tap root which is often damaged or even broken when older plants grown in pots are lifted out of frames. This almost always leads to death. It is better to get young plants and plant them in spring time. They will need some weeks of watering under shading to encourage deep rooting. After the first year all established genistas are dry and heat tolerant plants.

***Genista pilosa*** ‘*Minor*’ an old and now rare European cultivar slowly covers the ground and forms dense evergreen mats, in my front yard. Still worth searching out, if you can find it.



*Genista pilosa* ‘*Vancouver Gold*’-  
grown in a trough in Scotland  
grown/photo by Anthony Darby.



The Canadian registered cultivar ***Genista pilosa*** ‘*Vancouver Gold*’ is used as a ground covering plant in North American landscaping (5-10cm high and more than 100cm broad). The plants are slow to develop above ground and take about two years to establish a fantastic root structure. After this the top growth develops quickly. They are used to cover difficult banks and very dry exposed areas, so they are not suitable for a very small garden though it has been used successfully in a trough to contain it. It is exceedingly beautiful with its very dark green foliage and when in flower (in full sunny exposure) it is totally covered with bloom. It is very a showy seedling selected at the University of British Columbia Botanic Garden.

*Genista pilosa* making an impressive display after sixteen years in the garden of [Potterton's Nursery](#) in Lincolnshire. Photo by Rob Potterton.

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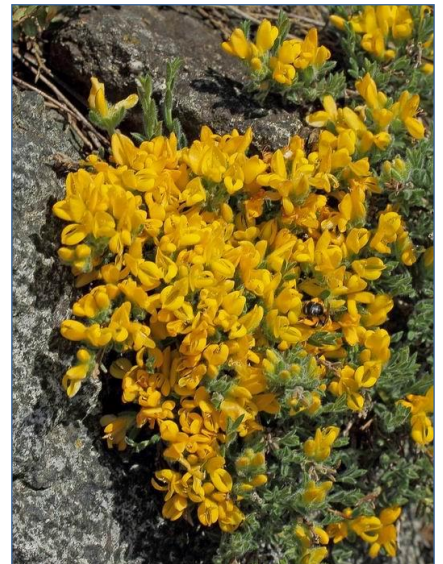
***Genista sylvestris* var. *pungens*** is armed with short green spines. This species, endemic to the Balkan Peninsula, is a slow-growing shrub with smaller flowers in short inflorescences. Horrible sharp spines and larger flowers are typical for the Spanish ***Genista horrida* (synonym *Echinospartum horridum*)**. Everybody admires its huge cushions reaching 40 x 200cm or more over very many years on the Beauty Slope. Growth is thick and quick; plants are fully hardy in our continental conditions. It can be sheared directly after flowering, being careful not to go into older wood.



*Genista horrida*, syn. *Echinospartum horridum*

*Genista subcapitata* at Palašica in the Pirin Mts. and far right, in cultivation.

Two of the smallest species suitable for miniature gardens (in jardinières or rock gardens) are the southern Bulgarian ***Genista subcapitata*** (from marble areas of the Northern Pirin Mts.) and ***Genista sericea*** (from marble areas of the mountains of Bulgaria).



## ---International Rock Gardener---



*Genista sericea* in the Slavjanka Mts.

***G. sericea*** is more open, grey and hairy than the compact ***G. subcapitata***. They bloom regularly with flowers of good size. Flowers are borne in short round heads just above the grey green cushions. I have grown them both for 35 years and they are less than half a metre in diameter. They are true saxatiles, from an elevation of 1600-2000m, which prefer planting into narrow crevices. They deserve to be introduced into broader cultivation.

# ---International Rock Gardener---



*Genista carinalis*



# ---International Rock Gardener---



*Genista carinalis*

## ---International Rock Gardener---

I highly recommend the Bulgarian cushion-forming shrub named ***Genista carinalis*** from the limestone slopes of the Rhodope Mts. It grows at lower elevations in the montane zone with *Linum uninerve* and *Trachelium rumelianum*. The wiry twiggy stems are covered with masses of golden yellow flowers and the polsters are 30 x 50cm. Established plants can be damaged in some cruel winter or frosty springs but they will soon recover and produce new shoots.

The Bulgarian subalpine ***Genista depressa*** is sometimes in circulation among rock gardeners. It is a really small shrub (under 10cm tall) growing in nature in crevices of granite.

I have no intention of describing deciduous *Genista lydia* (the common garden form) which is 30-60cm high and about a metre across. This plant is used for quick massive planting in modern landscaping design; it is deer resistant and not easy to kill and well known as Lydische Ginster. This robust plant which grows in the eastern Balkan Peninsula should be rightly named ***Genista januensis* subsp. *januensis*** (according to new taxonomy by Kit Tan, 2004).



*Genista januensis* subsp. *lydia* – close up.

About ten years ago I hiked high above the cool waters of the Abant Lake in NW Turkey (the ancient land known as Lydia). Above the forest, where corms of *Cyclamen coum* were rolling loose above ground, I found small flat mats of an unknown *Genista* with some ripe seed. Now in the gardens it is small ground hugging shrub about 5cm tall with golden yellow flowers. It self-sows in my garden.

After a quite long period of blooming the area around the older plants becomes a source of young seedlings suitable for potting or planting directly into some free space. Of course, only the youngest seedlings should be transplanted, before the long tap root develops.

There is variability in this species; some plants could become too vigorous for a small garden. The botanical name of this lovely shrublet is ***Genista januensis* subsp. *lydia*** and this dwarf Turkish variety is superb for all kinds of gardens.

---International Rock Gardener---



*Genista januensis* subsp. *lydia*

## ---International Rock Gardener---



*Genista boissieri* Spach is a synonym of *Echinopartum boissieri* (Spach) Rothm. Above: shown with grayish blue *Pterocephalus spathulatus* and below: a close up.





## ---International Rock Gardener---



*Genista involucrata*, from Turkey, is a small, hairy little shrub, with flowers in terminal clusters.



*Cytisus scoparius*

## ---International Rock Gardener---

The genus *Cytisus* has, over 200 years, earned an importance place in gardens. They are perennial shrubs offering flowers of white, pink or golden yellow in early summer. Some species of *Genista* were for a long time botanically included in the genus *Cytisus*. They are well adapted for any light soil and any sunny place. I will not deal with ***Cytisus scoparius*** (Scotch Broom), which is now a dangerous weed in the North American coastal ranges. These large bushes so popular in the horticultural trade, with many nice cultivars, are invasive in milder conditions (a mature bush produces 12,000 viable seeds). This European species (like many Fabaceae shrubs) does not like deep pruning into old wood.

White Spanish Broom – ***Cytisus multiflorus*** (syn. ***C. albus***) has invaded the milder parts of Australia but is not fully hardy in Central Europe. This species from Spain, Portugal and Morocco prefers (like *C. scoparius*) acid soils and has been used in hybridization. The new medium tall cultivar ***C. m. 'Durus'*** is quite hardy. It is deciduous, scented and is important to honey production. ***Cytisus purpureus*** with lilac-purple flowers on arching branches is a less aggressive species and suitable for ground cover or planted to hang down at the edge of large dry walls. I had ***C. purpureus 'Atropurpureus'*** with very attractive large purple pink flowers for 30 years. This lovely shrub is lower than half a metre high but its roots sucker underground and spread into surrounding areas.

I recently planted a wild broom from SE Europe, ***Cytisus purgans***, in my Czech steppe conditions just to see if it could survive. In Victoria, BC, (in the mild part of Canada) it is a compact bush 160 x 180cm with upright branches and wiry twigs (3 mm thick), 35 years old and never trimmed. The flowers (10mm across) are prolific and a good yellow. It has some flowers throughout the summer and often has a smaller repeat bloom in the autumn. This is an interesting shrub for a hedge because it can be trimmed to remain dense and compact. ***Cytisus purgans*** obtained an Award of Merit (RHS England) in 1948.



*Cytisus ardoinii* on the Beauty Slope.

## ---International Rock Gardener---

*Cytisus ardoinii* – close up

Thirty-five years ago I obtained ***Cytisus ardoinii*** in an exchange with Hillier and Sons (Winchester, UK).

This small 3-foliolate treasure from the Maritime Alps (Southern France) is still in full health, flowering freely every year.

The flowers of ***Cytisus ardoinii*** are brilliant yellow on a prostrate firm mat of branches with twigs 1mm thick. I planted it in a big crack or pocket in my natural rock outcrop and it is now 15cm tall and 50cm across. No nutrition was ever added because all members of Fabaceae (Legiminosae) family have root nodules for symbiosis with friendly nitrogen-fixing bacteria and other microbes which dissolve minerals from bedrock.



Fabaceae shrubs are pioneer plants which improve poor lithosol soils for other plants which ask for some available humus and minerals.

***Cytisus ardoinii*** was used for breeding at Kew Gardens at the end of the 19<sup>th</sup> century with the help of gardener, botanist and curator William Bean (1863 – 1947). In 1891 ***Cytisus x kewensis*** (yellow *C. ardoinii* x white *C. multiflorus*), with arching branches covered with cream-coloured blossoms, was described and in 1987 ***Cytisus x praecox*** (*C. multiflorus* x *C. purgans*) was born. This hybrid was later used for breeding and it was improved into many pretty cultivars as 'Albus', 'All Gold', 'Hollandia', 'Zeelandia' etc.

In 1902 Kew produced ***Cytisus x beanii*** (*C. ardoinii* x *C. purgans*) which is in my garden and after 35 years only 40cm tall and 150cm in diameter. I am proud to have had my plant from the famous nurseryman Harold Hillier. I never water it and it has survived all our terrible winters and roasting summers. This shrublet in golden bloom is stunning and like other shrubs from this family its flowers are long lasting. I prune only the top part of branches with seed pods. It is a superb subject at the top of a wall where it can hang down.

## ---International Rock Gardener---

One of the best small hybrids is ***Cytisus* x 'Cottage'** which I imported to Prague from Scotland nearly 20 years ago. The story about the name of this shrub with compact architectural shape takes us to Jack Drake's Nursery in Scotland where a ***Cytisus ardoinii*** cross was made. Seedlings were planted for trial in a few places and the best plant was near the cottage where (the then head gardener, later owner) John Lawson lived. This distinct hybrid was named and propagated as **'Cottage'**. It has cream and yellow flowers in dense inflorescences around grey-green branches which arch gracefully. In a small garden or restricted situation this plant is tolerant of pruning the newer wood directly after flowering. On my hot dry slope **'Cottage'** has reached half a metre high. Botanists have taken a group of species with 3-foliolate leaves from the genus *Cytisus* and put them into ***Chamaecytisus***. Like *Genista* they are generally plants from Europe and the Near East. Flora Europaea says that it is "A taxonomically difficult genus in which interspecific hybridization appears to be of frequent occurrence".



*Chamaecytisus hirsutus* subsp. *polytrichus* on the scree garden of Milan Odvárka.

In the late 1970s I planted a beautiful flat shrublet named ***Chamaecytisus demissus*** Boiss. in my neglected rock garden. It was a selected flat clone without a cultivar name. I propagated and introduced it to Czech gardens. It flowered for 6 years with nearly sessile yellow flowers turning to orange-purple with age, and made carpets up to 5cm high and 60cm across. I lost it and now I discover that the botanically correct name is ***Chamaecytisus hirsutus* subsp. *polytrichus***. It is a species from Greece 10 – 30cm high, growing even at subalpine levels (2100m) on limestone and serpentine. I found the original dwarf clone in Canada so I can plant it again and care for this lovely shrublet.

## ---International Rock Gardener---

The very decorative but much larger relative from Northern Greece and Southern Bulgaria is ***Chamaecytisus eriocarpus*** (syn. ***Ch. absinthioides*** var. ***pirinicus***). This species with sericeous indumentum and quite large yellow inflorescences forms charming groups at montane levels (1800m) on limestone bedrocks. The shrubs are half a metre high and one metre broad. Another asset is the fragrance of its soft hairy leaves. We must try it in cultivation in medium to large gardens "immediately if not sooner"!

The Balkan Peninsula and Turkey are home to ***Chamaecytisus pygmaeus*** a 5-15cm tall procumbent shrub which I have never seen in the wild. Sometimes its seed appears in international seed exchanges, but I think that my plant with this correct name is a cutting from a dwarf clone grown in England. It is a miniature broom for easy cultivation in full sun. My plant, which I never water, is under 5cm high and reaches 40cm in diameter in a crevice with slightly alkaline soil. The yellow flowers (1-5 together) are erect and sessile on the surface of the cushion and the tripartite leaves have 6x4mm leaflets. The hairy calyx is purple.

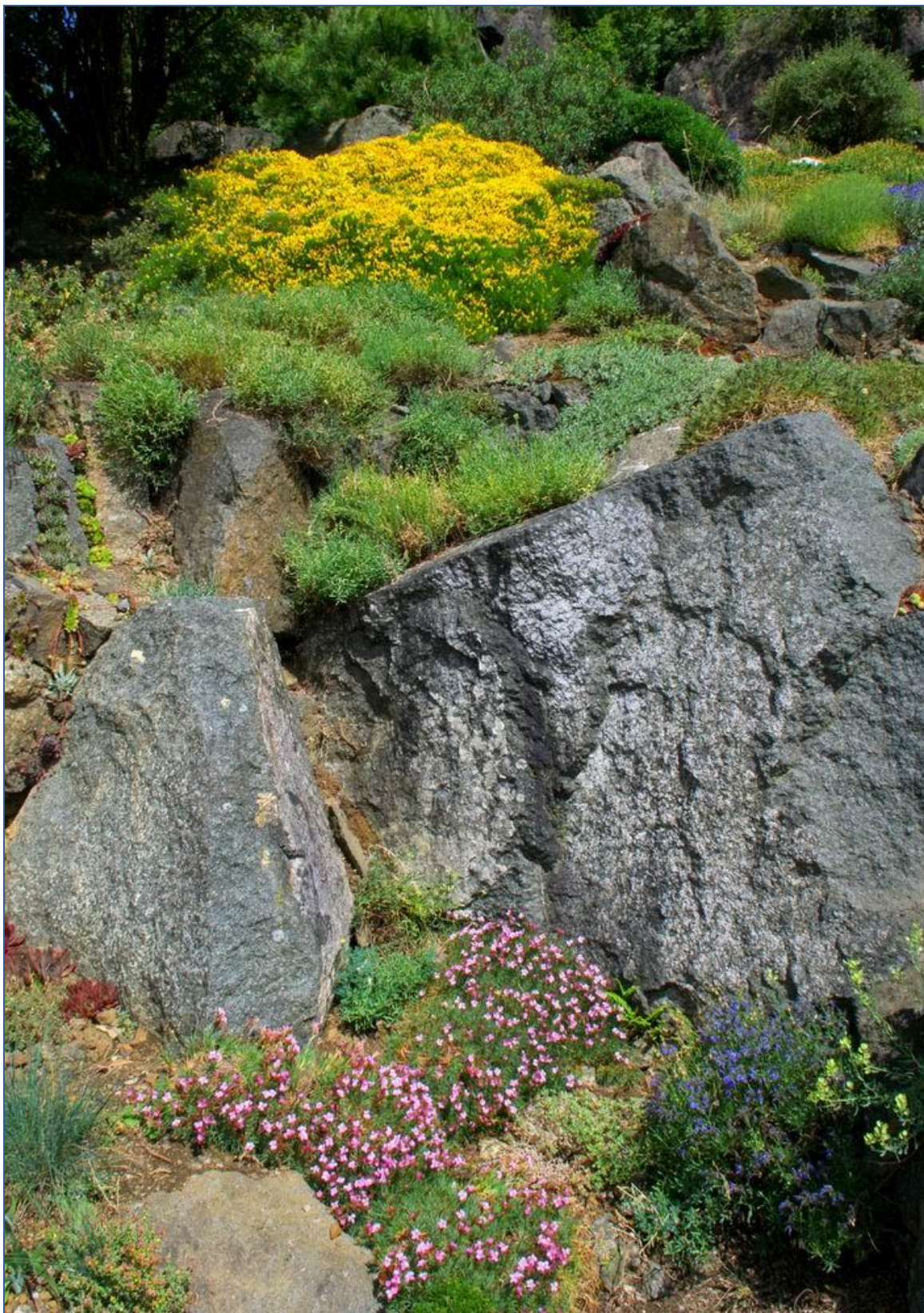


*Chamaecytisus gueneri*

The newest shrublet from the category for the smallest gardens is Turkish ***Chamaecytisus gueneri***. It is quite new in science (described Karaca Arbor. Mag. 4: 13 1997) and just two years in cultivation. This shrublet grows at the top ridge of Mt. Ida (1700m), the ancient Olympus of the gods of Troy, where Paris judged the qualities of three goddesses and unfortunately not this superb chamaecytisus. The portrait is a young seedling in my garden showing miniature grey-green leaves and fresh vanilla yellow flowers with good proportions. It is a saxatile plant so the best planting is between two stones in a crevice with gritty sandy soil. I hope that this attractive species will produce seed as a sign that is happy in our gardens.

## ---International Rock Gardener---

Some of these plants have been seen previously in the IRG, so perhaps your interest in them has already been piqued. This short trip among some “unsung” (neglected in commerce, advertising and writing) small brooms shows their diversity in sizes, shapes and colours and their qualities for modern landscaping. The gardener of the future will be short of three essentials: good soil, cheap water and time for maintenance. Small brooms are very happy without these three above mentioned subjects so they are destined for our future gardens. Z.Z.



*Genista carinalis* on the Beauty Slope – the garden of Zdeněk Zvolánek

# ---International Rock Gardener---

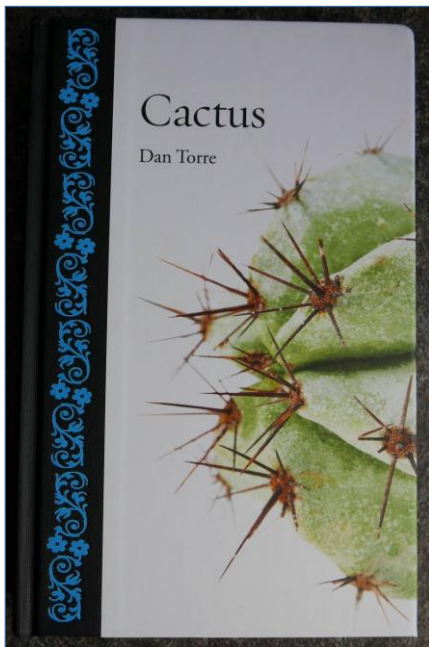
## ---Book Review---

### Cactus, by Dan Torre: a Book Review by Kenton J. Seth

It's hard to think that the world has room for another general-topic book, like one on cacti, in general, but it appears there is. As a hardcore cacti grower myself - hunting, propagating, and professionally planting out perhaps thousands of cacti over the years, as well as keeping a few hundred of them for pets, I foolishly thought I knew most of the good trivia and big-picture context about cacti - but I was very wrong.

Dan Torre, a professor in Australia, has truly enriched bookshelves with a broad yet specific subject matter: this book is indeed about the plant family cactaceae broadly, but is truly about the deep and subtle anthropological history of cactus in human culture, from pop culture incorporating the spiny plants into television and comics, to the politics of a "Cactus Curtain" planted at the infamous Guantanamo Bay Naval Base in Cuba.

Written in a textbook tone and arrangement, so extremely thorough and would make (and perhaps does) serve as a good curriculum for a college class on the subject "Cactus and humanity," but this is sometimes amusingly stiff and a bit of a rigid approach for a side-table book for the naturalist and enquiring reader. For instance, he points out the distinction between cactus portrayed as human-like and humans portrayed as cactus-like in literature, fine art (like Renoir), and even advertisements, which are all quoted, described thoroughly, and not surprisingly, cited with references.



Credit must be given - the writer was extremely thorough in finding, compiling, and analysing, it would seem, every time that cacti enter the human lexicon. I did find the index a tiny bit lacking in thoroughness for specific mentions, which does not seem like the type of mistake the author himself would make.

I learned that and had the obvious pointed out to me that the plants hold their moisture in the form of a mucilage, and that during the worst of the invasion of Prickly Pears (*Opuntia* spp.) in Australia, that people massacred their local birds because the animals could spread the cactus seeds very far by eating the fruit and passing the seeds, further creating a strange and indirect negative impact on Australia's native ecosystem.

Perhaps because of the deep thoroughness of the book, which is fertile substrate for the reader to start independently wondering about themes, one thing the book may be missing is some less factual, less "concrete detail" content: for instance, some discussions about trends and patterns that we have been shown in the book, like some conjecture as to why human culture has treated

cacti the way it has, or brief comparison of it to our relationship with other families of plants.

Growers, gardeners and wildflower enthusiasts will be able to relate to his documentation of the world of cactus growing and cactus collectors, and we could all stand to absorb his enlightening section on cactus conservation, and see how its factors and arguments can be applied to many species on the planet outside of cactaceae.

Torre's tome is rich. It's absolutely maximally jammed with fascinating details and moments of satisfying discovery. It's a nature-trivalist's buffet. He is clearly passionate about the subject and I can't help but think that the book's images of giddy cactaceous tchotchkes are of artifacts he has on shelves at home.

K.J.S

"Cactus" by Dan Torre is published by [Reaktion Books](#) ISBN 9781780237220

Reaktion's Botanical Series is the first of its kind to integrate horticultural and botanical writing, with a broader account of the cultural and social impact of trees, plants and flowers. Earlier in this series was ["Snowdrop" by Gail Harland](#). The latest title is ["Rhododendron" by Simon Milne](#).