

# BULBS

**Bulletin of the International Bulb Society**



**Volume 5 No. 2**

**July - December 2003**

**Price \$5.00**

# International Bulb Society

## Directors

Alan Meerow .....	President/Co-Director, Publications/Science		
Kathy Andersen .....	Secretary/Assistant Mailing	Tony Palmer .....	Co-Director, Publications
Dave Lehmillier .....	Membership/Mailing	Pam Kelly .....	Treasurer
Karl King .....	Webmaster	Herb Kelly Jr .....	Awards/Seed Exchange
	Michael Loos .....		Publicity/Development

## International Representatives

Rachel Saunders .....	South Africa	John Grimshaw .....	UK & Netherlands
Andre Gaboriau .....	France	Tony Palmer .....	New Zealand
	Alberto Grossi .....		Italy

---

## Bulbs

The Bulletin of the International Bulb Society

### Editorial Staff

Editor .....

Tony Palmer	Associate Editor .....	Alan Meerow
-------------	------------------------	-------------

Do you have comments? We want to hear from you!  
Send comments to: BULBS - Editor, 12 Kelly Road, Oratia, Auckland New Zealand.  
Email to: [adpal@ihug.co.nz](mailto:adpal@ihug.co.nz)

---

## 2004 Membership Information

Join the International Bulb Society! Member benefits: annual *Herbertia*, semi-annual *BULBS*, educational website, email "IBS Members Forum", Seed Exchange (SX) and Bulb Exchange (BX) (for members of the email "IBS Members Forum").

1 Year US	\$40.00
1 Year International (air mail: <i>Herbertia</i> ONLY))	\$45.00
1 Year International (air mail: <i>Herbertia AND BULBS</i> )	\$50.00

Make payable to: IBS (in US funds only) and mail to:

Dave Lehmillier, Membership Director  
3530 Fannin, Beaumont, TX, 77701, USA.  
Email to: [IBSMEM@aol.com](mailto:IBSMEM@aol.com)

\*If paying by credit card, enclose your card number (MasterCard or VISA only) and expiration date. Or you may apply online via secure server: [www.bulbsociety.org](http://www.bulbsociety.org)  
Join the IBS Email "IBS Members Forum"!  
Contact Alan Meerow: [prez@bulbsociety.org](mailto:prez@bulbsociety.org)

---

## TABLE OF CONTENTS

First Words	<i>Tony Palmer</i> .....	2
Gloriosa Superba	<i>Alberto Grossi</i> .....	4
A Gardeners Guide to Crocus	<i>Tony Goode</i> .....	7
Australian Breakthrough	<i>Kingsley Dixon</i> .....	17
Reminiscences of Working with Jan de Graaff	<i>John Bryan</i> .....	18
Book Reviews	<i>Alan Meerow</i> .....	20
Plant Notes from South Africa	<i>Jim Shields</i> .....	22
Brunsvigia – A Lesson in Patience	<i>Terry Hatch</i> .....	25
Gigli di Mare	<i>Alberto Grossi</i> .....	26
Growing Clivia	<i>Terry Hatch</i> .....	28

---

### ADVERTISE IN BULBS!

**ADVERTISERS:** If you would like to advertise your products or services in HERBERTIA, please contact Alan Meerow. Email to: [prez@bulbsociety.org](mailto:prez@bulbsociety.org). (Please use ATT: ADS FOR BULBS as your subject heading.) Or call at 786-412-1821.

<b>Ad Rates:</b>	<b>BLACK &amp; WHITE</b>	<b>COLOR</b>
¼ page	\$75	\$100
½ page	\$100	\$140
Full page	\$160	\$280

**ADVERTISERS:** If you have a small nursery (or not so small) consider advertising in BULBS. Our readers have demonstrated their wish to support businesses that advertise in The International Bulb Society publications. Please contact Tony Palmer. Email to: [adpal@ihug.co.nz](mailto:adpal@ihug.co.nz)

<b>Ad Rates:</b>	<b>BLACK &amp; WHITE</b>		<b>COLOR</b>	
	once	Annual	once	Annual
¼ page	\$60	\$100/2	\$75	\$130/2
½ page	\$100	\$165/2	\$140	\$240/2
Full page	\$160	\$265/2	\$280	\$480/2

If you wish to run your ad in both publications, deduct 25% of the total from your order.

---

The opinions expressed by contributors in this publication are solely those of the individual writers and do not necessarily reflect the opinions of the editor, the board of directors, or of The International Bulb Society, Inc. (IBS). The IBS publishes paid advertisements as a service to its members but cannot be responsible for the quality of bulbs, geophytic plants, seeds, services, supplies, or other merchandise received, nor for guarantees expressed or implied.

The International Bulb Society, Inc., is a non-profit organization. Said corporation is organized exclusively for educational and scientific purposes; and especially to promote, encourage, and foster the horticulture, development, and improvement of bulbous or geophytic plants and public interest therein. These purposes are expressly limited so that IBS qualifies as an exempt organization under IRS code section 501 (c) (3).

Copyright 2004 International Bulb Society  
All rights reserved

### COVER PHOTO

*Crocus cartwrightianus* by Tony Goode

One of the great things about our shared interest in bulbs is that the objects of our passion are so incredibly diverse. It is impossible to imagine getting bored with them because there are always new ones to explore and learn about and hopefully grow. Hardy bulbs; tender bulbs; bulbs from just about every corner of the world. Large, small, and sometimes even microscopic. Species or the wonderful ( or sometimes not so wonderful ) hybrids that have been bred by so many enthusiasts over the centuries. We each have our favourites and one of my hardest jobs as Editor of BULBS is to try to have as wide and balanced a variety of topics as possible in each issue. If you have waited in vain for the type of bulbs that eat up all your spare time to appear, then maybe you should consider writing about them for us all!

Our feature article in this issue is called “**A Gardeners Guide to Crocus**” and is a beautifully illustrated guide to the Genus, highlighting the more easily observed features of the Crocus plant which are useful in distinguishing the different species. It also includes some hints for successful cultivation. Tony Goode from Norwich, England is the author and illustrator.

Don't be put off from contributing by not being able to write fluently in English as we can usually get articles translated. Two excellent articles this time were written by an Italian member, Alberto Grossi. One is on Gloriosa lilies and the other on Pancratium and both were translated by Angelo Porcelli. Also illustrated by the author.

Trying to balance the origins of the authors as well as the bulbs, our next two come from the US, although John Bryan tells us in his “**Reminiscences of working with Jan de Graaff**” that he snuck into the States under the French quota of the time! Jim Shields, on the other hand, is most definitely a native, having been born, raised and educated in Indiana. He is still to be found there if he's not holidaying in exotic parts of the world. His recent trip to South Africa is recorded in his diary type account “**Plant Notes from South Africa, May – June 2004**”.

Our President, Alan Meerow, has written the book reviews for this issue. He has covered “**Agapanthus for Gardeners**” by Hanneke van Dijk, as well as “**Amaryllis**” by Starr Ockenga and “**Hippeastrum, The Gardener's Amaryllis**” by Veronica M. Read.

Various other snippets, including a short article by

Terry Hatch speculating on whether the mycorrhizal fungi associated with *Podocarpus totara* trees are the cause of clivias growing so well underneath them and another by the same author whose patience with Brunsvigia was well and truly rewarded, conclude this issue which I hope you will all enjoy. My sincere thanks go to Carol Longley of Auckland, New Zealand for the layout and Spencer-Walker Press in America for the printing.

Now I think it is time to give the current IBS Board of Directors a collective pat on the back for their sterling efforts over the last twelve months. Working hard but quietly and without fuss and bother, great strides have been made. If you haven't looked at the Society's web page lately, please do so as our new webmaster, Karl King, has added lots of pictures to the gallery and made all sorts of other improvements. The accompanying chart and graph show that this is all appreciated by an incredible number of visitors to the site (over 4 million hits since June 2003).

Similarly the IBS Bulb and Seed exchange under the astute guidance of Herbert Kelly, Jr. has thrived and has even made a very healthy profit for the Society. A note from Herb:

*My gratitude to all listed below for their generosity, kindness, and loyalty to the International Bulb Society. Without your very generous donations in 2003, the IBS Bulb and Seed Exchange would never have been such a success. It is truly an honor to be associated with such a great group of bulb enthusiasts.*

Barbara Ciravolo William Drysdale Marc Hachadourian Charles Hardman Rich Hart David Kafkewitz Herbert Kelly Jr. Pamela Kelly Victor Lambou David Lehmler Don Martinson Jerry May Judy McBride Alan Meerow Kevin Preuss Steve Putman Jim Shields Russell Stafford Robert Turley Michael Vassar

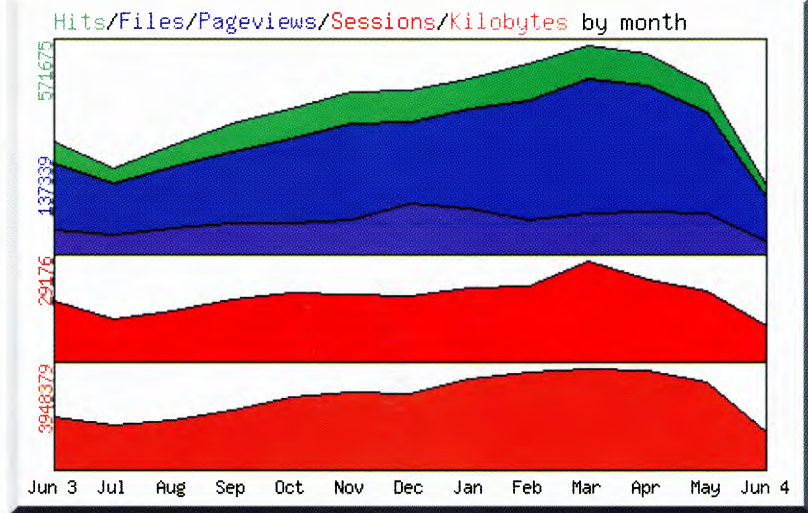
*Sincerely, Herbert Kelly Jr.*

Thanks for all your hard work, Herb. Congratulations too on having been awarded the Herbert Medal for 2005. Full details in the next issue of *Herbertia*.

Others work assiduously in the background away from the glare of publicity but their efforts are no less important. Pam Kelly keeps the Society's financial accounts on the straight and narrow, and Dave Lehmler has the unenviable task of keeping track of



### Access Statistics for libra the last 12 months



Short statistics for June 2004 (updated more frequently)					
Month	Hits	Files	Pageviews	Sessions	KBytes sent
June 2004	12560	10288	2225	678	97985
May 2004	458348	388407	110072	20241	3412735
April 2004	547182	459788	115684	23744	3868963
March 2004	571675	476914	110619	29176	3948380
February 2004	521702	420212	93121	21972	3776570
January 2004	478477	398890	123601	21501	3510867
December 2003	448597	360680	137339	18833	2938886
November 2003	441603	358156	92913	19279	3018337
October 2003	394966	314403	84995	20077	2793863
September 2003	357306	281020	82987	17871	2269081
August 2003	296103	236511	68109	14651	1889651
July 2003	235680	194019	52186	12131	1716695
<b>Total</b>	<b>4764199</b>	<b>3899288</b>	<b>1073851</b>	<b>220154</b>	<b>33242008</b>
<b>Average</b>	<b>397016</b>	<b>324940</b>	<b>89487</b>	<b>18346</b>	<b>2770167</b>

membership and mailing. Kathy Andersen, our Secretary is currently working on an advertisement exchange with other like minded Societies. All held together, overseen and if necessary gently badgered by Alan Meerow who encouragingly reports quite a few "newbies" on our online forum recently.

Some late breaking news – scientists in Australia have discovered the compound in smoke that promotes seed germination. This is exciting to us especially as so many of the plants we grow come from the likes of South Africa or Australia where the smoke from bush fires breaks seed dormancy. I wrote to Dr Kingsley Dixon at Kings Park in Perth, the leader of the research team and he sent me his press release for us to publish

in BULBS. What really gave me a thrill was that he would like IBS members to become involved over the next 3 years or so in the next stage of his research, which is basically testing the compound out on species that growers know there are seed dormancy issues with. He has asked our Society to manage a compilation of key dormant seed species. A supply of up to 1000 viable (i.e. good quality) seeds then needs to be made available to him for testing. This is a great and fascinating challenge for us and I hope as many of you as possible will be able to take up that challenge.

Well that's enough from me other than to wish you good growing!

# Gloriosa superba

Text and photos by Alberto Grossi  
Translation by Angelo Porcelli

When it bloomed for the first time for me, my mother had no doubts: it was the merry-go-round of her early childhood, familiarly called “calcinculo” (literally “kick-your-back” – but maybe it can’t be properly translated to English). She compared the stamens to the long chains from whose ends, hung in the air, are the seats which are the yellow anthers. All towered from the flamboyant petals.

The charm for me was to have a climbing lily.

My way to call the *Gloriosa superba* L. wasn’t so original at all; I found later that not only in Italy but also in all the World it is so called, as well as “glorious lily”, “flamboyant lily”, “Mozambique lily” and “Malabar climbing lily”. It was from this coastal Indian region (Malabar) that *Gloriosa* was introduced in 1690 by Dutch botanists and quickly spread over all Europe, at least in the famous greenhouses of royal courts, where Redouté painted it in his gallery of “*Liliacées*”. *Gloriosa superba* (glorious and superb in Italian) are two words which hardly need any translation or explanation, at least for us Latinos. They identify one of the most appealing bulbous plants for summer flowerings. If we want to be picky, the only fault we can find is the lack of any fragrance.

Linnaeus classified it as *G. superba* in 1753. Currently botanists don’t agree on the number of species and this varies from about 30 for some authors to barely 5-6 for others, or just one species for extreme lumpers, with a number of varieties according to the different environments (this last theory is supported by the number of chromosomes, common to all species/varieties known). Recently it is no longer placed in the *Liliaceae* family but in *Colchicaceae* with this last being segregated from the former by the presence of alkaloids in the roots of the belonging genera/species. *Sandersonia* and *Littonia* have been similarly placed.

*Gloriosa* L. has a wide range of distribution extending from tropical Africa to tropical Asia and India. It is an herbaceous plant with a season’s growth from an underground tuber. This last has an L or V shape and it can be up to 15-20 cm, forked, with a yellow-brownish skin covering it. From an ‘eye’ at the tip of the tuber the new growth starts that can develop

into a long stem up to 2-3m long, according to the varieties and cultivation conditions. Leaves are dull



green, arranged in clusters, opposite or alternate along the stem and ending in a tendril which is helpful to climb in nearby plants. The inflorescence is terminal and branched and on healthy plants bears several flowers. In bloom these are greenish, but as they grow they increase in size and change color till the six tepals open and expand totally. Color and size identify the varieties:

- 1 In *G. superba* the tepals are narrow, very curly, red with a yellow base – in full flowering up to 20cm across; the var. *lutea* is totally yellow instead; the var. *greenii* has wide tepals, shorter and deflexed, always a vivid yellow.
- 2 In *G. rothschildiana* the flowers are more open,



undulate rather than curly, and the yellow base vanishes with the days to turn into a uniform red crimson. It was introduced into cultivation in 1904; there exists a var. *citrina* with yellow petals bordered with a crimson line; the var. *aurantia* has orange flowers.

- 3 *G. abyssinica* differs by having very large tendrils and yellow flowers.
- 4 *G. carsonii* is the larger form, often lacking tendrils, with purple red flowers bordered with a yellow line.
- 5 *G. simplex* (syn *G. virescens* ), introduced in 1823 from Mozambique, is of a smaller size, tepals are wider in the central part, waving at the margins, and are a crimson color with a yellow base; the var. *plantii* has yellow-reddish flowers; the var. *grandiflora* has bigger flowers; the var. *leopoldii* has tepals blunted at the tips.
- 6 *G. verschurii* has crimson flowers with margins and tips yellow.



*Gloriosa carsonii*

In 1998 a new species was described – *G. sessiliflora* Nordal & Bingham, coming from Zambia. *G. sessiliflora* is an erect herb to 100 cm from a stoloniferous corm. The flowers, 2-4 per stem, are funnel-shaped and sessile; tepals are 4 x 1-1.5cm, narrowly ovate, undulate, yellowish orange near the base and reddish distally. The style makes a small angle of a few degrees with the longitudinal axis of the ovary, whereas in *G. superba* this angle is 90°. So the flower reminds us of *G. superba* in the color but *Littonia* in the shape. I asked Mrs. Isobyl La Croix (“Orchid Review” Editor) involved in a study about *Colchicaceae* from Africa for an explanation. She in her turn asked Inger Nordal, one of the authors of the newly described species: the angle of style to ovary is the only important distinguishing feature, probably related to the pollination system (sunbirds for *superba* and butterflies for *sessiliflora*). She concludes that *G. sessiliflora* is the gap between the two genera, *Gloriosa* and *Littonia*, which should probably not be kept separate.



Seed of *Gloriosa*

In spite of its tropical origins, *Gloriosa* can adapt to different soils and environments, from poor and

dry soils, to most suitable rich and moist. Cultivation can start any time of the year for cut flower production or flowering potted plants for indoor decorations. Usually, if greenhouse conditions aren’t available, tubers can be planted 5 cm deep in late spring in a well prepared light and draining soil, straight in the ground or in pots. Plants need a support on which to climb; alternatively plant them near an evergreen shrub where they can show their fabulous flowers against a green screen of foliage. Plants need a sunny to partial shaded position. Watering and feeding are carried along all summer till the leaves start to go yellowish which is the sign that the plants are preparing for dormancy. At this point watering is reduced and feeding stopped.

Once the above ground vegetation wilts, tubers can be dug and stored in a cool and dry place for the winter rest, after dusting with a fungicide as a precaution. Cultivation outdoors can be tried in warmer climates (zone 9-10), but tubers need protection from rains during their rest.

Asexual propagation can be easily accomplished by cutting the tuber in two sections, where it forks naturally. Alternatively, it can be started from seed. These need to be cleaned thoroughly, removing the wrinkly reddish skin to show a brown seed, to avoid fungus growth during germination. This operation is made easier by soaking the seeds 24 hours before to clean and to soften the skin. Germination is quite lengthy; usually 4 months are required to see any activity. The first year small tubers are formed that will turn into



the typical shape in the following years.

In India it is widely grown for the extraction of alkaloids such as colchicines and tiocolchicoside, used in pharmacology. Juice from the leaves is instead used by native Africans against intestinal worms, head pests, skin affections, infertility and impotence. Also as poison for arrow tips, as all the parts of this plant are highly poisonous. Non-medicinal uses are cut flowers in religious ceremonies or for supposed magic powers of the flowers to keep out snakes. As a cut flower either the single flower or the whole inflorescence can be used. Harvested at the blooming, they last up to eight days in vase.

The more frequent pests are aphids, which affect the growing tips, and red spider mites which cause a premature yellowing of the leaves. A bacterial rot of tubers can happen in bad growing conditions and infected soils.



*Gloriosa greenii*



*Gloriosa rothschildiana*



*Gloriosa lutea*



*Gloriosa rothschildiana*



# A Gardeners Guide to Crocus

Tony Goode

All Photographs by the author

The crocus will be a familiar plant to many gardeners, especially those with a Mediterranean type climate. It is a small perennial plant well adapted to a winter wet, summer dry regime, with its energies stored in an underground corm. In the wild the genus is centred on the Balkans and Turkey but has outlying stations west to Portugal, east to Western China, north to Poland and south to Jordan and Iran.

It is the purpose of this article to provide an illustrated guide to the Genus and highlight the more easily observed features of the crocus plant, which are useful in distinguishing the different species. I have included some hints for successful cultivation. It will not be possible to illustrate all the 120 plus taxa. Given the innate variability of many taxa this would be an immense task! An extensive list of reference sources appended will guide the interested reader to further information and other illustrations.

## The Crocus Plant

Initially it is necessary to consider the structure of the crocus plant. The corm is in effect a very compact underground stem made up of starch rich tissue. Of annual duration, a new corm develops above the old one, which is absorbed into it. Rarely stolons are formed from lateral buds, giving rise to small corms at their tip. The outer case of the corm, known as the tunic, shows considerable variation and is a very important feature in defining crocus taxonomy. It is possible to identify some species by corm shape and tunic features alone and in the following list of those features an example of a species representing each feature is given in brackets. The tunic may be smooth and eggshell-like (*Crocus laevigatus*); papery, splitting into rings at the base (*Crocus biflorus*); or fibrous. In fibrous tunics the fibres may be parallel (*Crocus aleppicus*) or netted. (*Crocus robertianus*). The nature of the netting varies from coarse (*Crocus robertianus*) to fine (*Crocus oreoreticus*). Each year a new set of tunics is produced. Species from dry regions often have the thickest tunics which accumulate in layers around the corm (*Crocus cancellatus*, perhaps giving some protection from desiccation. Species from wetter habitats often have the thinnest tunics, the old ones quickly rotting away (*Crocus kotschyanus*). The annual roots emerge from the (usually) flattened base of the corm, which is usually oriented 'flat side down'. Curiously two taxa have the corm oriented on its side in the soil (*Crocus kotschyanus* subsp. *cappadocicus*).



*Crocus laevigatus*



*Crocus biflorus*



*Crocus aleppicus*



*Crocus robertianus*



*Crocus cancellatus*

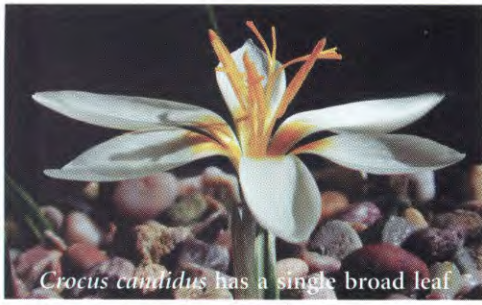


*Crocus kotschyanus*



*Crocus kotschyanus*  
subsp. *cappadocicus*





*Crocus candidus* has a single broad leaf

The growing shoot is enclosed by papery sheathing leaves, (cataphylls), the bases of which expand to form the corm tunic.

The grass-like leaves are easily recognised by the distinctive central white stripe, which is essentially an area of cells without chlorophyll. The number and morphology of crocus leaves varies greatly between taxa, with the single broad leaf of *Crocus candidus* and the many fine leaves of *Crocus pallasii* representing the extremes. The cross-sectional shape and the presence/absence of hairs are also important taxonomic features.



*Crocus pallasii* has many narrow leaves

Winter-growing bulbs have evolved different flowering strategies. Some flower in autumn, before the onset of harsh winter weather, perhaps taking advantage of high pollinator activity. Others flower in spring, soon after the winter snows recede. Many, mainly lowland species of *Crocus* are autumn flowering; some flowering with the leaves, others without. The spring flowering species flower with emerging leaves, although these may be barely visible in some high mountain species. The flower bud is enclosed by papery tissue, the prophyll, bract and bracteole. These are of taxonomic significance but the details are beyond the scope of this article. The flower is borne aloft on a strong floral tube, with the true stem remaining underground along with the ovary, only lengthening as the seeds ripen. Thus the seed capsule is held safely below ground until the optimum time for seed dispersal.



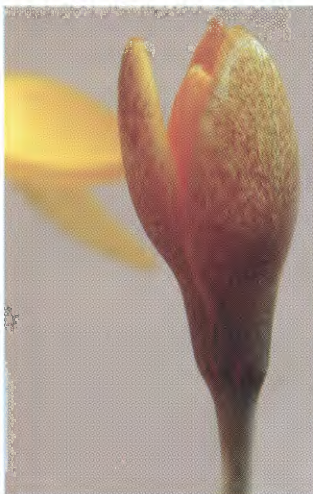
External markings:  
*Crocus cyprius*, blotch



External markings:  
*Crocus nevadensis*,  
feathering

The showy part of the flower is made up of two whorls of three petals. The inner ones are usually slightly smaller, and the outer ones often brightly coloured or marked. Common ground colours are shades of purple, yellow and white, although albinos occur across the genus. External markings take the form of blotches (eg *Crocus cyprius*), feathering (eg *Crocus nevadensis*), and stippling (eg some forms of *Crocus chrysanthus*). Occasionally the outer surface of the petals is a completely different colour to the inner ones as in *Crocus imperati*. More unusually the inner petals may have intricate feathering, which can be a very attractive feature of which a good example

is *Crocus cartwrightianus*. The throat of the flower is often of a different colour and it may have a ring of tiny hairs near the base as in *Crocus sieberi* ssp *sublimis*. This great variation in

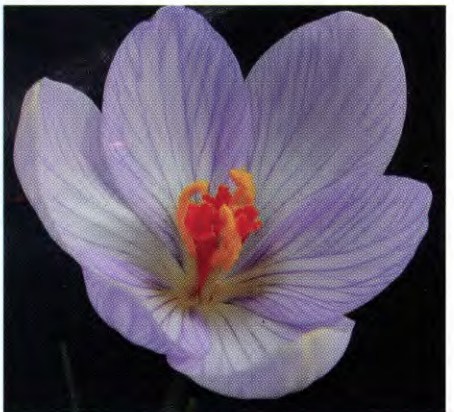


External markings:  
*Crocus chrysanthus*,  
stippling



A dramatic change of colour as the flowers in *Crocus imperati* open

is *Crocus cartwrightianus*. The throat of the flower is often of a different colour and it may have a ring of tiny hairs near the base as in *Crocus sieberi* ssp *sublimis*. This great variation in

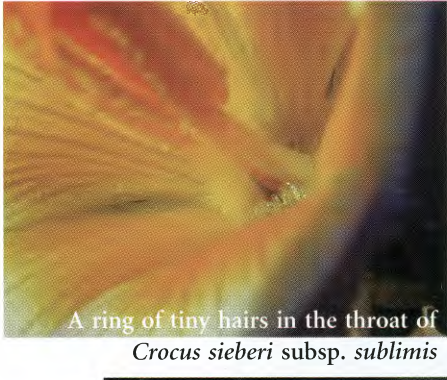


Delicate feathering inside an attractive form of *Crocus cartwrightianus*



colour and markings is one of the features which makes the genus so horticulturally interesting. However from a taxonomic viewpoint this variation, which can occur within taxa, makes flower colour one of the least satisfactory ways of telling the species apart. The size of the flower varies considerably between taxa. The smallest, *Crocus danfordiae*, being as little as 1cm across while the largest, *Crocus niveus* can exceed 12cm across when fully open.

Crocus flowers have three stamens held on short stalks (filaments) from the centre of the flower. The superficially similar colchicum and sternbergia each have six. The anthers may be yellow, white or blackish. White anthers usually bear white pollen but otherwise pollen is yellow. For successful pollination ripe pollen must be transferred to the stigmatic surface, which is at the apex of the style. The style, emanating from the centre of the flower, is commonly divided into three branches but can be much divided, which is a showy feature. The degree of division, length and colour of the style can be useful taxonomic features. Bees, moths and beetles distribute the heavy pollen mechanically, although this is an area that has been little studied in the wild. In cultivation, pollination can be assisted by the careful use of a fine artists paintbrush. Subsequent seed production seems to be improved if the plants are kept for a few days at temperatures of 10-15°C. Spring flowering species often flower in mid-winter in cultivation (in the UK at least) when ambient temperatures can be too low for successful fertilisation. The seed capsules of both autumn and spring flowering species mature at the end of the growing season, often as the leaves begin to die back. The seeds vary in size, shape and surface features. Fresh seeds often have sticky attachments, attractive to ants, which can distribute the seeds widely.



A ring of tiny hairs in the throat of *Crocus sieberi* subsp. *sublimis*



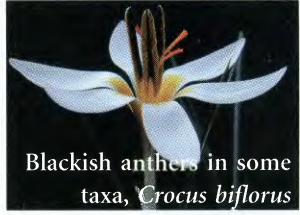
*Crocus danfordiae* has the smallest flowers in the genus



The giant flowers of *Crocus niveus*



White anthers are quite common, *Crocus cancellatus* subsp. *pamphylicus*



Blackish anthers in some taxa, *Crocus biflorus* subsp. *isauricus*



The showy, many-branched style of *Crocus tournefortii*



Ripe seed and capsule, *Crocus caspius*



Three red style branches, *Crocus longiflorus*



Garden pollination by a hoverfly, *Crocus pulchellus* 'Zephyr'



## The Species –

### A Classification of *Crocus*

(Mathew 1982 revised 2002)

Below is a breakdown of all the species. The most notable distinguishing features of each series are simply described and some species are briefly discussed. I include my own observations on cultivation. The cultivation of plants in gardens depends on balancing several variables successfully. Temperature regime, moisture, soil and situation, all combine to create the growing conditions. When reading these notes the reader should bear in mind that my comments are based on observations made in Britain. My suburban garden has a sandy soil. Minimum winter temperature is around  $-8^{\circ}\text{C}$ . Only twenty miles from the sea, which has a moderating influence, prolonged hard frost is rare and snow cover usually fleeting. Average annual rainfall is 24 inches. Summer is the driest season but usually punctuated by heavy downpours. The comments on cultivation refer to open garden cultivation. If you give suitable artificial protection and grow in pots, the modified conditions may allow a wider range of species to be grown. (Pot cultivation is covered later.)

## 1. Subgenus *Crocus*

### A. Section *Crocus* :

Flower scape enclosed by a prophyll



*Crocus vernus*

- a) SERIES VERNI – Reticulate fibrous corm tunic. Spring flowering. Outside of the flowers not conspicuously marked. Bracteole absent. *C. vernus*,

*C. tommasinianus*, *C. etruscus*, *C. kosaninii*, *C. baytopiorum*.

*Crocus vernus* and *Crocus tommasinianus* are probably the two most accommodating species for gardens in NW Europe. Tolerant of summer rain, they can seed around when happy. Selected forms of *Crocus vernus* are the mainstay of the horticultural trade in *Crocus* but the smaller flowered ‘true’ species offers a host of interesting forms to charm the discerning gardener. *Crocus etruscus* and *Crocus kosaninii* are also tolerant of garden conditions but *Crocus baytopiorum* is a challenge to grow well, probably requiring the long, cold winter (under snow) that it experiences in its high mountain native habitat.

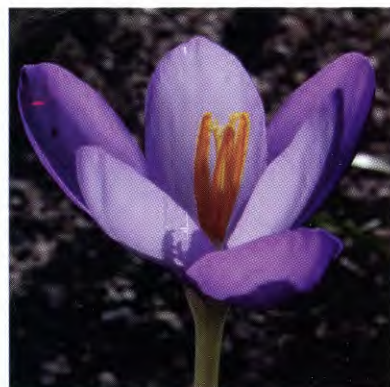
- b) SERIES SCARDICI – Leaves with only superficial white stripe. Spring flowering. *C. pelistericus*, *C. scardicus*  
Two very distinctive species, preferring cool conditions, which resent drying out in summer. The new season roots of *C. pelistericus* begin to grow in midsummer, sometimes before the old leaves have withered.
- c) SERIES VERSICOLORES – Corm tunic parallel fibrous. Flowers usually with strongly marked outer petals. Spring flowering (mostly). *C. malyi*, *C. versicolor*, *C. imperati*, *C. minimus*, *C. corsicus*, *C. cambessedesii*.

A group of considerable horticultural interest as the flowers are almost all brightly coloured and attractively marked. The exception, *Crocus malyi*, has large, robust, pure white flowers with a showy red style.

Largely of western Mediterranean origin, they are tolerant of garden conditions here, enjoying a warm spot that dries out somewhat in summer.



*Crocus malyi*



*Crocus goulimyi*





*Crocus kotschyanus*

d) SERIES LONGIFLORI –

Autumn flowering. Yellow anthers. Style divided into three distinct branches which often divide further at the apex. *C. nudiflorus*, *C. serotinus*, *C. longiflorus*, *C. medius*, *C. niveus*, *C. goulimyii*.

A group with showy flowers, mostly of uniform colour, without bright external markings. They will succeed in sunny, well-drained positions in gardens and mostly enjoy a warm dry summer rest. *Crocus nudiflorus*, a plant of mountain meadows in and around the Pyrenees, has been locally naturalised for centuries in many parts of Britain illustrating its suitability for garden cultivation here.

e) SERIES KOTSCHYANI – Autumn flowering. White

anthers. Style divided into three simple branches. *C. scharojanii*, *C. vallicola*, *C. autranii*, *C. kotschyanus*, *C. karduchorum*, *C. gilanicus*, *C. ochroleucus*.

*Crocus kotschyanus* and *Crocus ochroleucus*, which increase by rice grain cormlets, are widely grown in British gardens, enjoying the maritime influence of the summer climate that ensures regular rain. *Crocus vallicola*, propagated mostly from seed, is also successful given a situation that does not dry out completely in summer. The remainder, although attractive are less often cultivated as they require cool, moist conditions in a sunny spot to thrive. (Such



*Crocus oreoreticus*

conditions are not easy to provide in lowland Britain.)

f) SERIES CROCUS – Autumn flowering. Yellow anthers. Style three red branches. *C. pallasii*, *C. thomasi*, *C. cartwrightianus*, *C. sativus*, *C. moabiticus*, *C. oreoreticus*, *C. asumaniae*, *C. hadriaticus*, *C. mathewii*

A group of autumn flowering species requiring a hot, sunny position that dries out completely in summer. Some have very showy flowers with bright red style branches, although many forms of *Crocus pallasii* have less substantial flowers of limited horticultural appeal. *Crocus hadriaticus* is the species most likely to succeed in the garden in NW Europe being more tolerant of summer moisture.

*B. Section nudiscarpus :  
Prophyll absent*

g) SERIES RETICULATI – Corm tunic usually has clearly reticulated (netted) fibres. Spring and autumn flowering. Style three branched to much branched. *C. hermoneus*, *C.*



*Crocus sieberi sieberi*

*reticulatus*, *C. abantensis*, *C. angustifolius*, *C. ancyrensis*, *C. gargaricus*, *C. siehianus*, *C. veluchensis*, *C. cvijicii*, *C. dalmaticus*, *C. sieberi*, *C. robertianus*, *C. cancellatus*, *C. rujanensis*.

Most species in this group have garden potential but in many cases they are little cultivated and even less experimented with! However, *Crocus sieberi* and *Crocus angustifolius* are well suited to cultivation in the open garden in Britain. Indeed the horticultural trade offers several forms of *Crocus sieberi*. Several of the others are grown outside; *Crocus gargaricus*, *Crocus veluchensis* and *Crocus cvijicii* should succeed in a position that does not dry out excessively in summer.



*Crocus biflorus isauricus* flower

- h) SERIES BIFLORI – Corm tunic with basal rings, sometimes splits into parallel fibres. Usually spring flowering. Style three simple branches. *C. chrysanthus*, *C. almehensis*, *C. danfordiae*, *C. biflorus*, *C. pestalozzae*, *C. aeriis*, *C. cyprius*, *C. hartmannianus*, *C. adanensis*, *C. leitchlinii*, *C. caspius*, *C. kerndorffiorum*, *C. paschei*, *C. wattiorum*.



*Crocus biflorus pulchricolor*

Two of these *Crocus chrysanthus* and *Crocus biflorus* are 'parents' to many of the smaller 'species' crocus offered in the trade. The latter has a growing array of subspecies, often separated by small botanical differences. *Crocus pestalozzae* has persisted outside here for several years but is a very small flowered species, which needs to be sited with care. Several of the others have garden potential but are little grown.

- j) SERIES FLAVI – Corm tunic membranous. Splitting to parallel fibres. Usually spring flowering. Style usually much branched. *C. flavus*, *C. antalyensis*, *C. olivieri*, *C. candidus*, *C. vitellinus*, *C. graveolens*, *C. hyemalis*.

Although some forms of *C. antalyensis* are very attractive, this is a group of mostly small flowered species that find garden conditions in Britain too wet or our winters too short. The exception is *Crocus flavus* a distant ancestor of the large yellow crocus of gardens. The true species probably needs a warm spot that dries out in summer to thrive in Britain.

- i) SERIES ORIENTALES – Corm tunic membranous. Underlaid with parallel fibres. Spring flowering. *C. michelsonii*, *C. latavicus*, *C. korolkowii* Three species from the eastern edge of the genus.

*Crocus korolkowii* is the most widely grown and Janis Ruksans in Latvia has offered a number of selected forms. Golden yellow with varying dark brown markings on the outside of the outer petals, they can succeed outside but are best grown with protection in Britain.



*Crocus antalyensis*

- k) SERIES ALEPPICI – Corm tunic membranous, splitting to parallel fibres. Flowers autumn and winter. Style much branched. *C. aleppicus*, *C. veneris*, *C. boulosii*.

Three species with small white flowers, of little more than botanical interest. *Crocus boulosii* from Libya is not in cultivation. The other two flower in winter and are challenging to grow

well in Britain even given protection. They might prove easier in more southerly latitudes where



winter days are longer and summers are warm and dry.

- l) SERIES CARPETANI – Leaves rounded beneath. Spring flowering. Style white with three short branches. *C. nevadensis*, *C. carpetanus*.

Two little cultivated, distinctive species from southern Spain. *Crocus nevadensis* can be very attractive but is not the easiest species to please, even under glass, so far north of its native habitat.

- m) SERIES INTERTEXTI – Corm tunic interwoven fibres. *C. fleischeri*

Separated on account of its unique corm tunic, which consists of fine, interwoven fibres. It has a starry white flower with a bright red style and prefers a hot position and an alkaline soil that dries out in summer.

- n) SERIES SPECIOSI – Corm tunic basal having rings, papery. Autumnal flowers without leaves. Well divided style. *C. speciosus*, *C. pulchellus*

Two species well suited to garden conditions in Britain, tolerant of summer moisture. *Crocus speciosus* is widely available in the trade but I consider *Crocus pulchellus* to be a better garden plant. The flowers have a more robust floral tube and are less inclined to flop. Unfortunately some of the trade forms of *Crocus pulchellus* are hybrids with *Crocus speciosus*, which lack the grace of the true species.

- o) SERIES LAEVIGATI – Corm tunic eggshell-like, any fibres parallel. Anthers white. Style much divided. *C. laevigatus*, *C. boryi*, *C. tournefortii*.

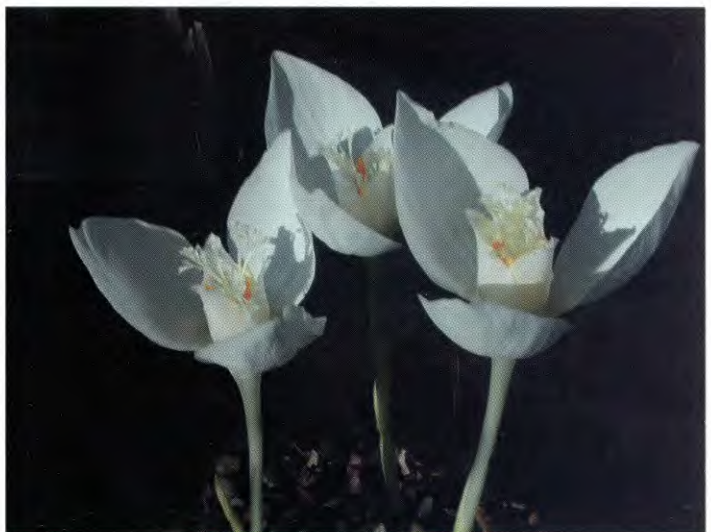
*Crocus laevigatus*, although having the smallest flowers, is very variable and offers many attractive forms, some of which do well in the garden. Forms from Crete (usually white with variable maroon markings) require a warmer, drier regime than those from the Greek islands. *Crocus tournefortii* whose flowers remain open at night and in bad weather (only one other species, *Crocus cartwrightianus*, behaves in this way) has proved a surprisingly good garden plant here.



*Crocus speciosus speciosus*



*Crocus laevigatus*



*Crocus banaticus* 'Snowdrift'

## 2. Subgenus *Crociris*

*C. banaticus*. Basically subdivided on differences in the way that the anthers release pollen, this subgenus contains just one species, the horticulturally interesting *Crocus banaticus*. This is very distinctive as it has three much smaller inner petals. The style branches are con-colourous with the usually purple flowers. Preferring some summer moisture it is easily cultivated in a cool maritime climate such as is found in Britain.

## A Crocus Collection

I grow many of the species listed above as part of the NCCPG (National Council for the Conservation of Plants and Gardens) National Plant Collections scheme. The NCCPG was set up in 1978 to “conserve, document, promote and make available Britain’s great biodiversity of garden plants for the benefit of horticulture, education and science.” I should point out that the NCCPG do not provide the plants. The scheme is a way for enthusiastic gardeners who have perhaps already amassed a collection of a particular genus to further their interest and to share that interest with others.

Most of the plants in this collection are grown in pots kept in cold frames. I have used clay pots successfully in the past but currently the collection is grown in square plastic pots. The cold frames that house the plants are very simple. A wooden frame supports glass lights (in fact recycled secondary glazing), which can be easily removed. The lights are used to give winter protection from November to early

March and to ensure a dry summer rest for the taxa that require this. Shade netting is also used in summer to reduce solar gain from the glass lights as this can lead to desiccating conditions. While most crocuses enjoy a warm dry rest period, few require a summer bake. The plastic pots stand on a bed of sand roughly 6 inches (15 cm) deep. The sand remains slightly damp during the summer, moderating the summer drought. The basic compost I use is a mixture of John Innes No. 3, sand and grit (John Innes is proprietary loam based compost including added peat, grit, perlite and fertiliser). The sand is preferably sharp and gritty, to ensure excellent drainage. I also add some additional fertiliser. Until 2003 I used bone meal, but have recently switched to Vitax, a balanced compost additive. When mixing compost the aim is to provide a mixture that will retain some moisture but will drain freely, and never become waterlogged.

The corms are best planted at least half way down the pot. If planted too shallowly they will often develop a contractile root, which pulls the corm deeper but uses valuable energy reserves. A top dressing of coarse grit is optional but may help reduce moisture loss and is aesthetically pleasing. I would recommend repotting annually but the plants will tolerate repotting alternate years appreciating supplementary feeding in the second year. Watering of both spring and autumn flowering species is commenced early in September. If possible I leave this to nature, simply removing the glass lights and letting rain soak the pots. Most of the watering through the growing season is from natural rainfall but it is important that the plants do not dry out, as this will cause premature dormancy which greatly weakens the plants. Feeding in March with sulphate of potash watered into the compost or a high potash liquid feed boosts the plants at the time when the next season’s corm is developing and should improve flowering.

Many *Crocus* species increase naturally by corm division but unfortunately this is often a slow process (the crocuses in the horticultural trade are exceptional clones selected in part for their reproductive vigour). Seed is a good way to acquire *Crocus* species and is the most common means of reproduction in nature. Seed is available from a range of specialist nurserymen around the world and also from various societies seed distribution



*Crocus pestalozzae* (refer page 12)



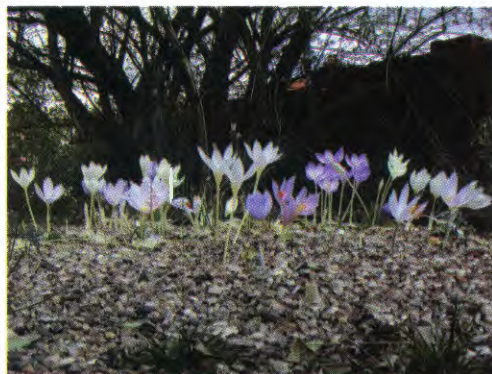
schemes. Seed should ideally be sown as soon after harvest as possible. This maximises the length of the first growing season and can shorten the time taken to reach flowering size. The seed should be planted in similar compost to that described above and covered with at least one inch of compost. I keep all ungerminated seed pots in a north facing cold frame, moving them under the benches in my well ventilated greenhouse when germination occurs. This gives the newly germinated seedlings a bit of extra protection and guards against frost damage as many germinate at the coldest part of the year. I am also then able to give dilute liquid feed when watering the plants, which helps to build strong first season corms. Repotted for the first time after the second growing season, most species will flower in three or four years after sowing.

Cultivation problems are relatively few. Aphids can attack the plants and as a vector for virus disease it is important to tackle them as soon as seen. Good ventilation (hence the open sided cold frames) and avoiding overcrowding are key factors in reducing the likelihood of a problem. I use aerosol sprays to kill aphids, if the spray has a systemic action that is an added bonus. The starch rich corms are attractive to rodents (you will know the likely candidates in your part of the world.) Late summer or autumn is probably the time of greatest risk and newly planted corms are particularly vulnerable. This said, once a new source of food has been identified they may return to systematically work their way through a collection of potted plants.

The genus *Crocus* has much to offer the discerning gardener. The small flowers may never dominate a garden display but can be a sophisticated addition to the rock garden, raised bed or trough. Some species can be naturalised in grass to form part of a wider 'natural' planting scheme. While the individual flowers may be relatively fleeting, their jewel-like appearance, often after the winter gloom, lifts the spirits. The genus offers such a wide range of species that it is possible to have a crocus in flower in eight months out of twelve in Britain. (In the wild there are crocus in flower every month of the year.) *Crocus* species are extremely variable and the variation is



*Crocus dalmaticus* (refer page 12)



Garden crocus Autumn b



*Crocus aleppicus* (refer page 12)



Garden crocus Autumn



*Crocus hermoneus* (refer page 11)



not just between species. There are many subspecies described and even within individual taxa show considerable variation. This all combines to make this a most fascinating bulbous genus, which has captivated the attention of enthusiasts around the world.

## Biography

Tony Goode lives in Norwich, a city in the east of England. Encouraged to take an interest in plants from an early age, he has always enjoyed growing things. Tomato plants and half-hardy annuals grew on the windowsill of his university accommodation; alpiners and dwarf bulbs were an interesting option for the window boxes outside his first floor flat when he started work. Moving to a house with a 'proper' garden saw a rapid expansion in the collection of dwarf bulbs, including many species narcissus, fritillaria and iris as well as crocuses. Employed full time as a shop manager, most of his spare time is now spent raising children. However the crocuses are tolerant of this although many other garden projects are on long-term hold! A regular contributor to *The Alpine Gardener*, he also lectures on alpiners and dwarf bulbs. Having belatedly developed a passion for mountain flower holidays he looks forward to seeing more crocuses in their native haunts.



## Reference Sources

- Elliott, J. *Bulbs for the Rock Garden*. ISBN 0 7134 7424 6  
*Herbertia* 44:33-53 (1988) *Crocus moabiticus*  
*Herbertia* 49: 67 (1994) *Crocus kerndorffiorum*  
*Herbertia* 49: 76 (1994) *Crocus paschei*  
*Herbertia* 49: 79 *Crocus biflorus albocoronatus*  
*Herbertia* 50: 68-81 Syrian crocuses.  
 Mathew, B. *The Crocus*. ISBN 0 7134 33906 Out of print but sometimes available second hand. The definitive book about the genus. Recently updated through the two articles below.  
 Mathew, B. *Crocus Update* (part one). *The Planstman* (New Series) Vol 1 Pt 1 March 2002 pp 45-57  
 Mathew, B. *Crocus Update* (part two) *The Plantsman* (New Series) Vol 1 Pt 2 June 2002 pp 92-102  
 Mathew, B. *Growing Bulbs*. ISBN 0 7134 4920 9  
 Mathew, B. *The Smaller Bulbs*. ISBN 0 7134 4922 5  
*Quarterly Bulletin of The Alpine Garden Society* (QBAGS) 64, 4: 414-416 *Crocus nudiflorus*  
 QBAGS 66, 3: 353-360 *Crocus Desiderata* – A look at some unusual crocuses  
 QBAGS 66, 3: 361-364 Account of *C. cvijicii*, *C. veluchensis* and *C. pelistericus* in the wild.  
 QBAGS 68, 2: 241-242 *Crocus minmus*  
 QBAGS 68, 2: 228 *Crocus x goteburgensis*  
*RHS Manual of Bulbs*. ISBN 0 333 615395  
 Rix, M. & Phillips, R. *Bulbs*. ISBN 0 330 302531 Great pictorial guide  
*The Alpine Gardener* (QBAGS) 71, 2: 137-143 Crocuses in the Garden  
*The Kew Magazine* (*Curtis Bot. Mag.*) (1990) 7, 4: 184 *Crocus rujanensis*  
*The Kew Magazine* (1984) 1, 2: 70-73 *Crocus gargaricus*  
*The New Plantsman* Vol 1, 2: 102-106 *Crocus mathewii*  
*The New Plantsman* Vol 2, 3: 182-184 *C. wattiorum*  
*The New Plantsman* Vol 5, 1: 12-14 *Crocus biossieri*

There are extensive listings of crocus in the index to each volume of *The AGS Bulletin* (December edition) which provide details of and accounts of successful cultivation.

<http://www.thealpinehouse.fsnet.co.uk> (Follow link to crocus pages) A web reference for the genus. Some basic information for all taxa and many images

<http://www.edgewoodgardens.net>. John Lonsdale has some excellent galleries of plant images including extensive collection of crocuses.

Many specialist nurseries have images of crocuses on their web sites and some include useful cultivation advice.



# Australian Scientists Make World First Discovery in Seed Germination .....

On July 8th 2004 the prestigious international journal *Science* published findings by scientists from Kings Park and Botanic Garden in Western Australia in collaboration with The University of Western Australia and Murdoch University, isolating and identifying a potent and new molecule that stimulates seed germination. The team comprised Dr Kingsley Dixon, Associate Professor Emilio Ghisalberti, and PhD student Gavin Flematti of the University of Western Australia and Associate Professor Robert Trengove of Murdoch University.

For hundreds of years, African tribes have used smoke to improve germination of red rice and maize. 15 years ago South African botanists used bush smoke, derived from burning plant material, to promote the germination of wildflower seeds. Although some of the top laboratories in the world have researched the action of smoke in germination, the identity of the active agent(s) in smoke has until now, remained elusive.

The team discovered a chemical a unique butenolide that induces germination in a broad range of wildflower, bushland and agricultural species from Australia and around the world including celery, parsley and echinaceae. Important agricultural weeds such as rye grass and wild oats also respond to the chemical possibly heralding a new and effective method to control weeds in agriculture by stimulating germination of dormant seed banks prior to other treatments. The chemical induces earlier and more synchronized germination with likely benefits for agricultural industries particularly in marginal cropping regions.

The scientists also found that the compound is active at extraordinarily low levels, parts per trillion concentrations. These concentrations are some of the lowest recorded in biology and agriculture and indicate that the chemical is likely to have wide acceptance as a naturally occurring substance that is safe to use.

For weed control and in land restoration industries in Australia and overseas, the potency of the chemical is so great that it equates to about 1

gram (quarter of a teaspoon!) per hectare. For restoration activities, particularly bushland, the discovery has potential to be of great value in improving germination from dormant seed banks without resort to burning.

Research is now focused on safety testing and deriving analogs for more effective restoration opportunities as well as investigating the mode of action of the molecule in native and agricultural species worldwide. Key research linkages and partnerships are presently being formed.

This discovery represents one of the most significant advances in seed science with benefits in the natural, agricultural, conservation and restoration sciences while providing a new and exciting method for scientists to understand the role of wildfires in the world's ecosystems and biodiversity.

## Thank you

*Below is a list of members who  
donated money to various IBS funds  
during calendar year 2003.*

JOHN GRIMSHAW  
BYRON HERSHEY  
DAVE LEHMILLER  
ALAN MEEROW



# Reminiscences

## of working with Jan de Graaff

*John E Bryan*

I first met Jan de Graaff in a hotel in Versailles, when he interviewed me for a position at the Oregon Bulb Farms. I had been working for several years for Vilmorin-Andrieux in France. I was at that time the manager of their perennial nursery and propagating perennials, Iris, Dahlias and many other plants.

The head of the firm, Andre de Vilmorin, who told me of the opportunity of going to the United States and working for de Graaff, had recommended me to him. In those days (1961) there was a quota system and I entered the States under the French quota. De Graaff offered me a position and over I came. He met me at Portland airport and took myself, my wife and young daughter Daphne to Gresham, the headquarters of the firm. For the next ten years I had the privilege of working at the Oregon Bulb Farms. I became Sales Manager and Vice President and travelled to Europe and North America and de Graaff looked after sales in other parts of the world.

De Graaff was a very private man, but kept his eye on all the operations at the OBF. Working with him was fun and demanding. When a batch of new hybrids came into flower we would spend hours evaluating them and selecting those that were of merit and worthy of introduction. After selecting and tagging new hybrids, I would have to write the descriptions for the catalog and work with Herman Wall photographing them. He would read the descriptions and slowly he came to rely on them. Naming new introductions was a challenge and he insisted that any name given should be easy to spell.

Traveling to a show one time, we had with us some of the early Dwarf Oriental Hybrids. What should we call them? We bandied about numerous names but none met with his approval. I said, "These little rascals are a problem are they not?" "No, you have just named them" he said, "Little Rascals is a good name for them." And so they were called.

Unexpectedly meeting him for dinner one night in Williamsburg – I thought he was arriving the next day – his first words to me were: "Do not order the red wine John, they chill it!" He was drinking his favourite drink Jack Daniels, Green Label. When with him in such places you could not wish for a more pleasurable companion.

He was always full of ideas for promoting lilies, sending bulbs all over the world and cut flowers to flower arrangers. Those to whom we sent the flowers realized they looked great and used them in floral arrangements which slowly started to appear in the background of various ads for all types of products in top of the line magazines etc.

I asked why we didn't sell 4 to 5 inch bulbs, as our large planting stock flowered so well. "We ought to," he said, so we started to sell them. I think it was the next year we had a very large order for thousands of them. We were not getting enough off the grading belts. "Tell them to squeeze them a little." "Fine" I said, "but what do I tell the customer when I see him?" "Say they are a little smaller this year" he replied. I did and there were no problems!

De Graaff would walk through the warehouse and pick up pieces of string used to tie the bundles of cartons. He would put them in a ball and place them on my desk. You should not waste things he would say. This over a few cents worth of string!

When a shipment of some \$60,000 worth to the Netherlands arrived there sprouted, I expected to hear some words from him. I went into his office and told him I had inspected the shipment, seen it placed on the ship and had marked all the forms etc. His remark was, "Yes I know, but these things happen." "Now I want your opinion on this." The new catalog had arrived. That was it.

Shipping time was hectic. He always wanted to know when this or that order was being shipped. On a particular day I told him that if he would stop bothering me, the orders would go out more quickly. Without a word he left. Jack Greenaway, who was my assistant, said to me, "John you just told de Graaff to get the hell out of your hair." "Did I really?" I asked. "You sure did" he replied. Hell, I thought, I had better apologize so I went to his office. "No need to apologize John, you were quite right."

He seldom visited my home, but one day I invited his daughter to come to a party I was giving. He sent along two bottles of dimple scotch. I was to say the least surprised but grateful. His daughter drank gin if I remember rightly. It was a good party!



On a flight to Europe one year, I apparently hired two stewardesses to come and model our lilies. I had completely forgotten about this when de Graaff called me to his office. "Two girls phoned to say you had hired them for our colored brochures" he said. "You were certainly generous with the stipend they are to get." "I told them to be here next week" he said. "They had better be good." (I must have been feeling no pain when I hired them because I could not remember how they looked.) They came and we took some great shots of them with our lilies, and obviously he approved of them as he insisted on taking them back to the hotel each night!

Yes, de Graaff was a difficult man to get to know, but above all he was always fair. He was great to work with and has given me many treasured memories of my time at the OBF. I cannot remember a time when I did not enjoy being with him. Alas both those days and de Graaff are gone.



*Jan de Graaff (right)  
with the author*



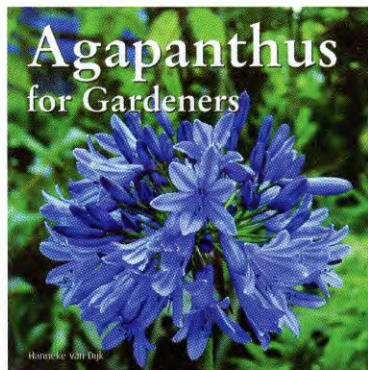


# Book Reviews

by Alan W. Meerow

Miami, Florida

**AGAPANTHUS FOR GARDENERS.** Hanneke van Dijk. Timber Press, Portland, OR. Hardcover, 96 pp., 611 color photos, 2 color maps, 2 tables, 8 1/2 x 11", hardcover. \$24.95. ISBN 0-88192-656-6 2004.



Agapanthus are well-known South African plants that have become ubiquitous landscape perennials in California, Australia, New Zealand, Europe and the southern U. S. Rhizomatous plants that do not form a true bulb, the 6-10 species, both evergreen and deciduous, have been variously classified as either onions or amaryllids. In fact, DNA sequences indicate that *Agapanthus* is an ancient branch of the lineage that led to both. The flowers of agapanthus are most often blue, but white forms also occur. They are borne on umbels on leafless scapes. Appreciation of agapanthus as garden subjects has probably achieved its zenith in Europe, and the over 600 cultivars that have been developed by selection or breeding have largely originated there. Two books have been recently published by Timber Press in tandem. **Agapanthus: A Revision of the Genus** by Wim Snoeijer, will be reviewed in the *Herbertia* volume 58. Hanneke van Dijk, an

enthusiast from the Netherlands, provides the horticultural companion to the former in this modestly priced and sized volume. The book opens with a collection and cultivation history of the genus, followed by a non-technical discussion of the botany of the group, heavily influenced by Snoeijer's concepts. Oddly, details on the species are relegated to a separate chapter, "Species," later in the book. Most of the general horticultural information

is compressed into a chapter entitled "Garden," followed by a section on cut flower use. A short section labeled "Plant Collections" seems rather extraneous, but is only four pages long. Fully half of the book's pages are devoted to descriptions of a significant number of cultivars, including a very nice compendium of lists of varieties arranged by flower color, habit, size, and a few other morphological characters. The book ends with a short bibliography and source list. The only serious weakness in the book is the writing itself, which is not very lively, and descends at times into awkward dullness. Entirely illustrated in color, **Agapanthus for Gardeners** is about all any horticulturist could want in a book on these attractive and fairly carefree plants.

**AMARYLLIS.** Starr Ockenga. Clarkson Potter, New York. Hardcover, 95 pages, 1/2 x 10.28 x 7.78", \$20.00. ISBN 0609608819. 2002.

**HIPPEASTRUM, THE GARDENER'S AMARYLLIS.** Veronica M. Read. Timber Press, Portland, OR. Hardcover, 344 pp., 120 color photos, 1 line drawing, 7 x 9", \$39.95. ISBN 0881926396. 2004.



If the appearance of two books in two years on the subject is any indication, general interest in amaryllis (*Hippeastrum*) is on the rise. The approach in each of these two

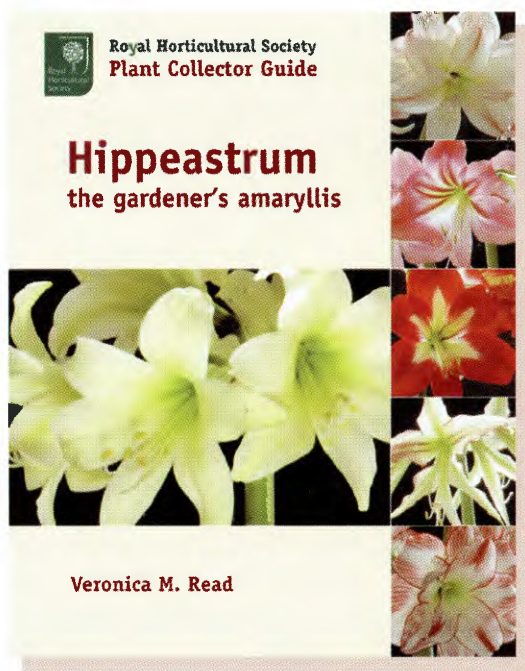
volumes is quite different, however, and, depending on the extent of one's passion for the genus *Hippeastrum*, one or the other may suffice to fill the slot in the garden bookshelf reserved for amaryllis. Starr Ockenga is a professional photographer who has published two previous books that focused on gardens and gardeners in a general way. Having recently added a greenhouse to her home in upstate New York, she purchased some amaryllis hybrids along with a number of other tropicals. "Before long

I had turned my back on the rest and focused on the amaryllis, thrilling to their architectural stature,



brilliant wardrobe, and enigmatic personalities.” Ockenga spent a winter cultivating 90 *Hippeastrum* varieties in her greenhouse, documenting her horticultural journey on film. *Amaryllis*, the result of this newfound passion, is at once a delightfully personal introduction to the cultivation of amaryllis bulbs, and a spectacularly alluring mini-coffee table book of stunning plant portraiture. The book is divided into four main sections after a brief introduction. “Amaryllis Through the Centuries” provides a history of *Hippeastrum* in botany and horticulture; “Making Magic” is a guide to cultivation; “Inside Amaryllis” describes the morphology and propagation of amaryllis. Finally, “What’s In a Name” is an illustrated encyclopedia of 97 *Hippeastrum* hybrids. In a sense, all of this compressed information is merely icing on the cake. This book is well worth its modest price just for the beautiful photographs which can be enjoyed purely for art’s sake. I doubt that the genus *Hippeastrum* has ever been celebrated as elegantly as through the beauty evoked by Ockenga’s photographic skills. Nonetheless, the book also functions as a practical guide for the novice, covering all bases evenly, from propagation to pests, with a prose style that communicates directly without slipping into the mundane. It would make a wonderful gift to the uninitiated, packaged with one or several bulbs of its namesake.

Like Starr Ockenga, Veronica Read’s introduction to *Hippeastrum*, a scant 11 years ago, soon turned into passion. To say that Read has devoted the past decade to amaryllis might actually be an understatement. With single-minded tenacity, Read set out to learn all she could about amaryllis, especially the development of the many hybrids that have been developed over two centuries. Anointed as the National Plant Collection Holder for *Hippeastrum* in the UK, Read has intimated herself with the major breeders of the genus in Europe, South Africa and elsewhere. *Hippeastrum, the Gardeners Amaryllis* is the culmination of this intense decade of studious infatuation, and it is an impressive testament to Read’s devotion. The book begins with an historical exploration of the genus, related genera (such as *Worsleya*), and the more distantly related *Amaryllis*



*belladonna* from South Africa. The latter is laudable, given the long and bitterly debated taxonomic controversy over which genus should bear the botanical name *Amaryllis*. Though a bit out-of-date in its orientation, this review is probably about as much as the average reader would want on the subject. This is followed by a short review of the species. Ms. Read goes to great pains in her introduction to state that the focus of the book is on hybrids, but her list of species is credible, albeit marred by the unfortunate failure to provide the proper botanical authorities for taxonomic

combinations into *Hippeastrum* for species first described as *Amaryllis*.

The next six chapters are devoted to discussing the extensive development of each class of *Hippeastrum* hybrid, each followed by an annotated list with descriptions of many named hybrids within each class. The strength of these chapters is Ms. Read’s unrestrained commentary on the relative strengths and weaknesses of each variety. Chapter 8 surveys the structure, development and physiology of amaryllis bulbs. The next chapter provides cultural information, followed by chapters on commercial breeding and production, propagation, and pests and diseases. An appendix provides some details on variety protection and registration of hybrids. The book includes a glossary as well. The color photos are collected in an inset after page 96, and include a number of reproductions of classic botanical portraits of the species. The many portraits of hybrids, while not as artful as Ockenga’s, are nonetheless descriptive. Read seems particularly smitten by the spidery flowers of *H. cybister* hybrids, which, in fact, have not been great market winners, and devotes a bit more of a share of the color photos to their depiction than popularity would perhaps warrant. Without a doubt, the volume is the most exhaustive book ever written on amaryllis hybrids, and a giant step forward from Hamilton Traub’s *Amaryllis Manual*. Every serious collector of *Hippeastrum* hybrids will want to have this book close at hand, while the casual gardener might be better served by Starr Ockenga’s less detailed but warmer treatment. For the species enthusiast, however, the ultimate amaryllis book is still to come.

# Plant Notes from South Africa

May – June 2004

By Jim Shields

It was autumn in Africa. We traveled through South Africa from May 15 till June 11, 2004. Most flowering was long past, but we were there to meet *Clivia* growers. While we were at it, we delivered a few David Conway *Clivia* plants to customers too. We found that the bare-rooted *Clivia* plants rode in a suitcase in the checked luggage without apparent harm, despite flying at over 35,000 feet (ca. 10,600 meters) for about 15 hours. Temperatures inside the luggage ranged from 12°C to 22°C over the two-leg, roughly two-day trip from Indianapolis to Johannesburg.

In Pretoria and Johannesburg, the aloes were starting to bloom. We saw a few *Clivia gardenii* in bloom in various private collections. An occasional Australian Flame Tree sparked the landscape with its gaudy red-orange flowers. We paid our respects at the National Botanic Institute Pretoria, where we had a tour of the plantings with Dr. Clare Archer. *Chasmanthe aethiopica* were in scattered bloom here and there.

I gave a talk on trends in *Clivia* breeding in North America to a group from the Pretoria area *Clivia* Club. They showed up about 40 strong to have lunch, chat with each other, and listen to my summary of *Clivia* breeding. My talk was based on our two-week *Clivia* tour in California during March 2004. This presentation was repeated in Port Elizabeth, in George, and in Cape Town.

We visited many *Clivia* collectors in the Johannesburg-Pretoria area. It was a great pleasure to visit Wessel Lotter and his son, Rudo, renowned for their breeding of *cyrtanthiflora* interspecific hybrids. We had opportunities to discuss breeding programs with Norman Weitz and his son Emil. We also had a

nice visit with Tino Feraro and saw his breeding program, and later visited Fred van Niekerk and saw his interesting collection of wild accessions.

Charles Barnhoorn showed us around the Hadeco main offices and the Margaliesberg farm. They were harvesting the miniature amaryllis (*Hippeastrum*) bulbs when we visited.

In Tzaneen in Limpopo Province (formerly called Northern Province and once part of the old Transvaal), aloes were blooming everywhere. We saw *Aloe marlothii* along the highways and *Aloe arborescens* at God's Window. At Mount Sheba, *Aloe littoralis* was in bloom.



God's Window

The *A. marlothii* seemed to be on hillsides where cattle could not graze them so readily; they were often associated with the Organpipe Euphorbia. At the former farm of a pioneer *Clivia* breeder, the late Gordon McNeil, now maintained inside a nature reserve by his widow, Margot, we saw a subtropical paradise in bloom. However, very, very few *Clivia*s were flowering, even though most of the McNeil hybrids were apparently interspecifics. *Haemanthus albiflos* was in scattered bloom in some gardens, from Pretoria to Tzaneen.

We drove into the bush around Woodbush peak,





*Clivia gardenii* L and *C. caulescens* x *miniata*

outside Tzaneen, with Hilton Atherstone and we were treated to sights of *Clivia caulescens* in habitat, growing on steep hillsides and on trees, especially fallen trees. None were in flower, since *caulescens* is a late spring flowering species. However, the berries were just about ripe, and an occasional bright red cluster of ripe *Clivia* berries was seen. We were told that the Woodbush *caulescens* were a bit different from the Mariepskop *caulescens*.

In some of the private collections we saw, there were some most interesting plants. It was just about time for the *Clivia gardenii* and the “Swamp Clivia” to bloom, so some were in flower in the collections.

Some intriguing *Clivia* plants were seen in the collection of Fred van Niekerk, including an unusual *Clivia nobilis* with wider than ordinary leaves. Another interesting plant was an apparent wild hybrid between the “Swamp Clivia” and *C. nobilis*, dubbed *Clivia* “Maxima” by its discoverer. The leaf edges in “Maxima” are much more heavily toothed than in typical *gardenii* or in the “Swamp Clivia.” The leaf tips are much blunter than in “Swamp Clivia” but still tipped with a small point and never indented as in *nobilis*.

We flew from Durban to Port Elizabeth. We then drove along the Garden Route to George. From George we went to Oudtshoorn, in the Little Karoo. The Little Karoo or “Klein Karoo” is a semi-arid region between the coastal range, the Outeniqua Mountains, and the

Swartberg Range further inland. Ostriches are farmed there. In the Klein Karoo, near Wooster, we visited Ian Oliver at the Karoo National botanical Garden. In his planted beds, we spotted the Karoo form of *Haemanthus coccineus* with purple-spotted leaves. This form of *H. coccineus* is said to be fairly common in the Klein Karoo, but many bulb enthusiasts have probably never seen it. I had certainly never seen it before.

From Oudtshoorn we went over the Swartberg Pass following the old route which is a one-lane gravel and dirt road. The mountains were spectacular, and the aloes were in bloom. The land beyond the Swartberg is the Great Karoo - a desert similar to the Sonoran desert in the US Southwest.

We picked up the N1 highway, which leads from Johannesburg to Cape Town, and we headed into Cape Town. *Aloe ferox* and *Aloe arborescens* were the principal varieties seen in flower. An occasional *Kniphofia* was seen.

We made Cape Town our base for the final week of the trip. From our Guest House there we made day trips out to Stellenbosch, Hermanus, Darlington, Malmsbury, and the Kirstenbosch National Botanical Garden. We had the opportunity to see several species of *Protea* in flower, including the King Protea, also *P. repens*, and several others.

At Kirstenbosch, Graham Duncan gave us a tour of the recently built bulb houses. They are huge, and



made me very envious of all that space under cover from the elements! In the Conservatory bulb room, Graham had *Haemanthus albiflos* finishing up its bloom, but *H. deformis* and *pauculifolius* were in full bloom.

Also at the Kirstenbosch, John Winter showed us real, live plants of *Clivia mirabilis*. The leaves have a relatively wide light green midrib stripe or band. The leaf margins are not serrated, and the leaf tips are bluntly pointed. Dee Snijman showed us some of the herbarium

specimens of *C. mirabilis*, including some complex umbels from which ripe berries had been harvested. There were numerous specimens showing compound pedicels, or pedicels in which the primary pedicel bore at its tip not the flower but another array of 3 or 4 secondary pedicels. This phenomenon has been sporadically observed in other *Clivia* species; but the *C. mirabilis* show it in a significant number of plants. In an article in the *Clivia* 5 yearbook, Dr. Snijman reported on the intriguing observation that the “normal” *Clivia* with simple pedicels actually have a drastically reduced primary pedicel, and the pedicels we see are in fact the secondary pedicles.

There is still uncertainty in some minds about the exact status of the “Swamp Gardenii” from areas in KwaZulu-Natal province. Attempts to do DNA analyses of the *gardenii* complex have not worked out to date. *Clivias* have a very large genome, ca. 36 pg of DNA per cell, and short primer sequences have turned out not to yield intelligible patterns.

We visited *Clivia* growers in the Western Cape, including Coen Calitz, Gert Wiese, Johan Schoombee, and Johan Botha. Of course, only a few *clivias* were in bloom, mainly *C. gardenii* and some interspecifics. It was nevertheless a delight to talk with these enthusiastic growers of fine *clivias*.

On our final day in South Africa, we went out to see Rod and Rachel Saunders. They showed us their tissue culture laboratory and the nursery associated with it. They have a large greenhouse as well as shade houses and tunnels. They grow a lot of their plants directly in the ground.

Rod and Rachel are reclaiming a large section of their land from alien invasive trees, mainly Australian black acacia. In its place they have seeded native Fynbos plants and shrubs, from *Haemanthus pubescens* to *Protea repens*. When the alien vegetation was cleared out, a few natives such as *Sparaxis* and *Babianas* reappeared after having been apparently absent for many decades.



*Haemanthus coccineus* at Karoo Botanical Gardens



*Aloe marlothii* at God's Window



Rod and Rachel Saunders



# Brunsvigia – A Lesson in Patience

by Terry Hatch

For many years, perhaps back to Victorian times, a large bulbed *Brunsvigia* has been grown in the warmer areas of New Zealand. Grown under the name of *josephinae* the poor old thing hardly ever flowers. When it does it is a huge stem 100cm tall with lolly pink flowers in candelabra form – quite spectacular.

The sad part is that it has very bad virus and the green leaves are always mottled with yellow. Possibly the virus suppresses flowering as well, and its not the sort of thing you want in a collection of bulbs.

In 1982 I had a number of spikes on *Brunsvigia littoralis* which is a short stemmed plant 40cm tall with brick rusty coloured flowers, and thought some softer brick orange colour would be good! So I pollinated the flowers with pure white *Amaryllis belladonna*. The bulbs have grown slowly!!

In February 2004 a bud appeared at last and very quickly elongated to 100cm + tall. A huge candelabra of lolly pink flowers eventuated – not the long awaited colour expected. There is some reference to a hybrid in the UK that has become extinct and I believe the old *josephinae* is that plant. The colour isn't right for the species *josephinae* which also has grey leaves.

*Brunsvigia* hybrids with *Amaryllis belladonna* are easily made but do take time to flower.



*Brunsvigia x Amaryllis belladonna*



*Brunsvigia x Amaryllis belladonna* intergeneric hybrid x *Brunsdonna tubergenii*



# Gigli di mare

(Mediterranean spider lilies)

TEXT AND PHOTOS  
by Alberto Grossi

TRANSLATION  
by Angelo Porcelli

Thinking back to two times of my life, it seems it has been a curious coincidence. If all had happened two weeks before or later, I probably would never have met them. The first was during my military service, when I was sent out on a mission in a training field in Sardinia, about mid April. It was during a day off duty that, rather than choose to go in the usual small smoky bar, I decided on a nice walk in the countryside. The reward was the meeting of a rich native flora of small geophytes such as *Romulea* and *Iris*, several terrestrial orchids and in the showy mass flowering of *Pancratium illyricum*. The second one was almost ten



*Panocratium illyricum*

years later, during a summer holiday in Calabria on the Ionian Sea. Getting closer to the beach, I was intoxicated by a sweet scent filling the air. An endless expanse of *Panocratium maritimum* in full flowering, creeping out of sandy dunes, appeared to my eyes.

Dioscorides named these bulbs “*pankratium*” (from the ancient Greek *pan*: all and *kratos*: strength, that is almighty), but they have been little used for medicinal purposes since then, going against the name. Nowadays the plants of the genus *Panocratium* are grown for ornamental purposes only.

The genus was established by Linnaeus and published in 1753 in his *Species Plantarum*. There are about twenty species, which dwell in the areas around the Mediterranean basin, sub-Saharan Africa up to South Africa and Asia. All species grow from a bulb coated with brown papery tunics, with evergreen or deciduous strap-

shaped glaucous leaves. Inflorescences have a classic umbel structure, bearing several scented flowers, with a green basal tube that flares in six tepals; the stamen filaments broaden at the base in an inner cup. They are morphologically very close to the genus *Hymenocallis*, differing by having dry papery seeds instead of the fleshy ones of the spider lilies of the New World.

*P. illyricum* L. is found in Sardinia, Corsica and minor islands (Capraia) of the western Mediterranean, in rocky soils. Known as ‘star lily’ for its flower shape or ‘mountain lily’ for its inland habitat, its specific name is a misnomer, perpetuated since 1623 when Gaspar Bahuin described it as

*Narcissus illyricus liliaceus*. It grows from a suckering bulb, up to 10cm, which sends in mid spring linear-spatulate carinate leaves, 3-5cm wide and up to 50cm long. When the leaves reach full length, the flower stalk is ready for anthesis, which occurs in May normally. The umbels bear up to 14 sweetly scented flowers about 10cm across but with a small cup compared to other species. The following pods are globular and contain several little rounded black seeds (like pepper).

*P. maritimum* L. dwells instead along the sandy beaches of the European part of the Mediterranean basin while several similar species occur on the African-Asian parts such as *P. sickenbergeri* – Egypt-Israel; *P. arabicum* and *P. tortuosum* – Egypt; *P. foetidum* – Tunisia-Algeria; *P. canariensis* – Canary Islands. The large spread of this species is reflected in the great number of common names by which it is known.







*Pancratium illyricum*



Sometimes just a translation, but often true popular names. In Italy it is known as “giglio di mare, pancrazio, narciso marino, emerocallide valentina”; in France it is called “scille blanche, narcisse de mer, lis de Mer, lis Mathiole, pancraïs”; in Spain “azucena marina, lliri de Mar, lliri blanc de marines, pancraccio, lágrimas de la Virgen, nardo marino”; in Portugal “Narciso das Areias”; in Germany “meer-gilgen, trichternarzisse, dünen-Lilie, pankraz, pankrazlilie”; while in English it is “Mediterranean sea lily, sea-daffodil, sea-shore lily, sand lily, sand daffodil”.

Bulbs of *P. maritimum* can also reach 10cm like the former species, but they differ in having a very long neck, buried sometimes even to 50cm. This is an adaptation to its peculiar habitat, where it can be covered by sand blown and accumulated during winter stormy seas. This neck is quite ‘elastic’ and if the plant is exposed, it will dry out the upper part to adjust to new depth. Leaves are normally deciduous in habitat but more often evergreen in cultivation if adequate moisture is supplied during summer. This doesn’t seem to be detrimental for the flowering, which in this case will be usually earlier in July, whereas in habitat the event is triggered by an occasional deep summer rain more likely in late August or September. In both cases the flower stalk will emerge together with a new flush of leaves, with these last measuring 50-60cm long and 1-2cm wide with a pleasant glaucous bloom and slightly spirally twisted. The umbel is less rich, usually bearing no more than 8 flowers, but these are powerfully scented at evening. It’s a shame they are so short lived, lasting less than a day, but a good clump will have several flowers opening every evening and the show is guaranteed for some weeks. After pollination several big pods will form, each containing a dozen seeds. These are black and shiny, soft to touch and looking like liquorice toffees because of the presence of a spongy tissue which covers the true endosperm. These seeds can be blown easily and they also float as a further means of dispersal.

A third species, *P. angustifolium* Lojac 1909, occurs

in Italy and is endemic to some rocky islands off Sicily. It differs from *P. maritimum* in having narrower leaves and smaller flowers, as adaptation to a more xeric habitat.

Cultivation of both species is rather easy, as long as their basic needs are satisfied. They enjoy a good summer baking and like all Mediterranean geophytes a dry rest is required, especially for *P. illyricum*. This last is surely the hardiest of all, having a growing cycle from early spring to summer – rather short indeed. However, I have grown them with success for years, in a rather cold area of North Italy, that is Pianura Padana (Zone 8), in a sheltered corner at the foot of a south-facing wall. Propagation is easily accomplished from offsets, avoiding drying out the roots, but they can be raised from seed as well, with the only drawback being the rather long time of waiting for the first flowering which will occur 4 or 5 years later.

To end, the other species to be mentioned are the African *P. tenuifolius*, *hirtum* and the Asian *P. maximum*, *landesii*, *parvum*, *triflorum*, *verecundum*, *zeylanicum*, and *biflorum*.



*Pancratium maritimum*





# Growing Clivia

by Terry Hatch



*Podocarpus totara*, which are extremely hungry trees with very vigorous root systems, produce a thick mat of feeder roots at the surface of the soil. Digging is almost impossible as there are also very large woody roots which spread well beyond the canopy which is very dense creating dark shade.

To plant young Clivia in these conditions shallow holes have to be chopped out and the roots of the plants spread out. Extra soil is needed to fill the hole and a good mulch of sawdust. Then leave to nature.

The amazing results from this type of culture need thinking about. The plants quickly grow into large leafy dark green clumps and produce super stems of rich coloured flowers. The breeding helps but even the old orange form grows and performs well. It isn't that they have plenty of care, fertiliser or water. All of these are lacking although the few weeds are culled out.

We must look to the trees or rather the roots. Each root has many nodules which house mycorrhizal fungi and these would provide much needed nitrogen for the tree and Clivias. The addition of sawdust provides humus which stimulates the growth of fungi. This addition of sawdust each season builds up reserves of humus and a constant supply of nitrogen and other trace elements are available to the plants. Indeed the addition of sawdust to the surface plant beds helps smother the weed population. As long as it is not mixed with the soil it is beneficial and a no dig type of gardening can be carried out with the only digging being done by worms and other soil organisms.

*Editors Note*— for those of you who are unfamiliar with it, *Podocarpus totara* is a New Zealand native conifer which can grow to a gigantic size in the forest (up to 40 metres with a trunk up to 2.5 metres diameter) and live to a great age. A tree in Pureora Forest Park in the central North Island is 51 m tall, and another at Pureora Forest Park has a dbh of 333 cm and is 27 m tall.

## TELOS RARE BULBS

P. O. Box 4147, Arcata, CA 95518 USA

[www.TelosRareBulbs.com](http://www.TelosRareBulbs.com)

*We offer a wide selection of hard-to-find bulbs all grown in our nursery.*

**Bulbs of the Western USA  
Bulbs from Central & South America  
Bulbs of Southern Africa  
Bulbs from the rest of the world**

**CATALOG FREE**

**TO IBS AND PBS MEMBERS**

**We are now exporting**



SOUTH AFRICAN SEED AND BOOK SPECIALISTS  
P.O. Box 53108, Kenilworth  
7745 Cape Town, South Africa  
Tel: +27 21 705 0295 Fax + 27 21 706 7989  
e-mail: [rachel@silverhillseeds.co.za](mailto:rachel@silverhillseeds.co.za)  
Website: [www.silverhillseeds.co.za](http://www.silverhillseeds.co.za)

A catalog of seeds and books of bulbous and cormous plants for the connoisseur.

We source and supply seed of over 400 species of native South African bulbous, cormous and rhizomatous plants from the fynbos, grasslands and mountains, as well as diverse selection of books.

From Amaryllids to Zantedeschias

*See instructions on our website to find our online catalog or contact us for a printed catalog at the email address, fax number or postal address above.*



# TWO IBS PINS TO CHOOSE!

(So why not buy both?)



IBS has now produced TWO International Bulb Society pins. Both have been produced in a very limited quantity and are destined to become valuable collector's items. Actual size is one inch (25 mm) high x .75 inch (19mm) wide with a tie tack-type back. Number one features *Galanthus nivalis* on a dark blue field (enamel) with "IBS" in gold tone and the whole framed in a gold tone edge surrounding the enamel. The second pin features a photo of *Hippeastrum papilio* with IBS in orange on a maroon background.

*"Order one or both!"*

**\$10.00 each**

*These beautiful collectors items are available only while supplies last. Hurry! Order now.*

NAME: .....

ADDRESS: .....

CITY ..... STATE ..... ZIP OR POSTAL CODE .....

COUNTRY: .....

### QUANTITY ORDERED:

*Galanthus nivalis* ..... *Hippeastrum papilio* ..... TOTAL .....

TOTAL ENCLOSED: \$ .....

Send your check, cash, or postal money order made out to:

"International Bulb Society" (US funds only)

to: Dave Lehmler – IBS PIN OFFER,

3530 Fannin, Beaumont, TX, 77701, USA



International Bulb Society  
PO Box 336  
Sanger CA 93657  
USA

PRSRT STD  
US POSTAGE  
**PAID**  
SPENCER-WALKER  
PRESS