

ESPINAS Y FLORES



Program:

The Japanese Zen Garden

by Erik Gronborg

The great garden styles of the world are all reflections of the national culture: the Italian, the French, the English, the Persian the Chinese and not least the Japanese. In the modern world garden designers borrow from everywhere. Even though they rarely use cactus and succulents, the Japanese temple gardens offer valuable lessons to help us create gardens which are attractive at any time of the year. Irina and Erik Gronborg spent two weeks in Kyoto studying the classic Zen monastery gardens

**The Newsletter of the San Diego Cactus & Succulent Society Inc.
Affiliated with the Cactus & Succulent Society of America**

**Volume 38 Number 4
Saturday April 12th 2003
1:00 PM**

Room 101 Casa Del Prado, Balboa Park



Presidents Message

MARCH 16, 2003

We had a wonderful time at the meeting on March 8! Good to see so many of you - almost ninety members and guests signed in and we were all treated to one of the best BRAG TABLE exhibits in my memory. Thanks to everyone who participated by bringing in their special "babies." Mark Fryer did a good job of judging - hard to make those choices with so many outstanding plants to choose from. I encourage anyone who has not brought in plants for the brag table recently to look over your collection - surely there is some jewel that deserves to be shown off. This is also good practice for our big show - coming up June 7&8 - best to start now looking for those plants that you will bring in - we have a lot of new members and I want all of you to bring at least a few plants in June.

As I announced at the meeting, our experience at the Del Mar Home Garden Show was very fine - a beautiful weekend at the Fairgrounds brought out many plant lovers. Many volunteers showed up to help out - THANKS to Michelle Pickett, Kathy and Steve Harris, Eugene Orth, Nancy and Bert Elder, Herb Stern, Dick Kessler, Terry Parr, Joe Kraatz, Joey Betzler, Chris Miller, and Lee Badger. We talked to many people about the benefits of succulent plants, signed up some new members, and met some members who don't come to meetings -- all I can say is COME - you do not know what a fun and educational time you are missing!

Thanks to Mark Fryer for his informative talk on the genus *Frailia*. These are beautiful little plants and I hope more people will be inspired to collect and show them. Kelly Griffin also did a great job with his talk about *Echeverias*. I am constantly amazed at Kelly's ability to grow these plants from seed - it was enlightening to hear the secret is cookie containers from Trader Joes - I'll have to try that.

There was a great BENEFIT DRAWING table also. Thanks to Lee Badger for all his efforts to bring a fantastic collection of plants. Thanks also for those who made donations to the table - especially Lee Phelps for his very generous donation of books, journals, and plants. This continues to be a highlight of the meeting as many people take home plants and things they may never have thought to buy!

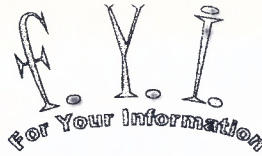
The program was a special treat for me and many others judging by the comments I heard afterwards. Richard and Franziska Wolf showed us the beauty and grandeur of the Baja Cape Region. This brought back many fond memories for me - a reminder that one of the most spectacular and unique places on earth to experience succulent plants is so close to home. Having the program translated as we went along was a first and though it took a little longer, I hope you all agree it was worth it to see the great photography the Wolfs presented.

If you have not heard, our very own Tom and Laura DeMerritt are currently in Kasakstan finalizing the adoption of their daughter Katya. They are keeping us posted of their adventures via email and it sounds like the trip of a lifetime, getting to know their child and her culture. We wish them the very best and pray for their safe return.

Don't forget Earth Fair - APRIL 27 - the big Earth Day celebration in the park - contact me if you are interested in helping out or selling plants - this is always a super fun day!

Enjoy the Spring -- see you April 12.

Pam Badger
pambadge@earthlink.net



- ◆ **April 12-13 South Coast Cactus & Succulent Society Show & Sale**, at South Coast Botanical Gardens, 26300 Crenshaw Blvd., Palos Verdes Peninsula, CA, 9am to 4pm. Displays by Selected Growers. Plant Sale. For information, contact Dick Hulett at 310-832-2262, airobatic@aol.com -- Come, enjoy & learn! (And buy plants!)
- ◆ **Seeds for Conservation: Coconuts to Parachutes**, Lecture with **Joey Betzler**
Seeds are one of the most powerful conservation tools in the struggle to protect endangered organisms. Healthy seeds produce the plants that are the foundation of ecosystems. Unravel the history of plant development and learn how seed-bearing plants distribute their seeds. Discover present techniques employed for long term storage in a modern seed bank. Wednesday, March 26; 6:30-8:30 p.m. in the Charmaine and Maurice Kaplan Theater, Member, Senior 60 and over, Full-time Student, Military, Children 6-17: \$6 per lecture; Nonmember: \$8 per lecture Class Code: P3-310-01

Here is that link: <http://www.sdnhm.org/education/brochure/lectures.html#seeds>

Seeds for Conservation: Seed Bank Workshop —Members only! Instructor: **Joey Betzler**. Learn modern seed banking techniques in this fascinating hands-on workshop held at the Wild Animal Park's Botanical Conservation Center/Seed Bank, where simple processes are applied to store seeds for up to 200 years! Gain practical experience in making voucher specimens and recording collection data, collecting and processing mature plant material, separating seeds from the chaff, estimating seed numbers, record keeping, and freezing a sample for long-term storage. Limited to 15 participants. Enroll now! Saturday, March 29; 10 a.m.-3 p.m. Member \$65 per person Class Code: P3-330-14

Here is this link: <http://www.sdnhm.org/education/brochure/adults.html#seeds>

- ◆ **March, 2003**
Anza Borrego Institute presents: Backcountry Seminars:
3/8 "Jet Boat Tour of the Lowe Colorado Mining Camps" \$50.00
3/15 "Discovering Camp Lockett" \$15.00
3/22 "Desert Plants A-Z" \$20.00
3/23 "Birds and Bighorns" \$15.00
3/29 "Geology of Split Mountain" \$20.00
Call 760.767-4315 for registration and information.
- ◆ **Elfin Forest Garden Festival**
Sat May 3, 2003, 10:00 AM to 4:00 PM
20223 Elfin Forest Rd. Escondido 92029
www.elfinforestgardens.info.
- ◆ Thanks to **Irina Gronborg** for the original art on the cover and the drawings in the introduction of our program.

How do I know which *Gasteria* is who ?

by Chris Miller

Gasterias are a challenge on many levels. Their variability within a species is dependent on growing conditions, original plant locality and the



mood of the plant. Pups off a plant can differ, so that you don't want to part with any of them. They are very promiscuous, crossing with each other, *Aloes* and *Haworthias*. Which makes some interesting plants, but complicates the process of identifying the plant.

Over the last 3 years, I have been studying *Gasterias*, trying to get to a point where I could feel confident identifying specific plants. Just when I think I have one down pat another piece of information comes along and I am confused again. I have attacked

this from various angles. Ordering from Burk's Nursery so that I have a physical example (unfortunately, these are juvenile plants and will take awhile to give me a good example). I have been downloading pictures and comments from the internet. I have compared my plants, which have about a 30% ID by label, with each other.

In an attempt to sort this information out I have put together a *Gasteria* Matrix (see enclosed sheet).



I consider this a work in progress. If you are interested I can e-mail you the sheet and I welcome input to make it better. The basis for the matrix is *Gasterias of South Africa* by E. J. van Jaarsveld. I took liberties with the wording, since my vocabulary isn't on par with his. Using his Glossary, I paraphrased so that I could understand the description easily. There is detail lost in this method, but I was getting nowhere trying to memorize the words.





Other sources of information on *Gasteria*:

<http://www.TheAmateursDigest.com/burks.htm> will get you to Burk's Nursery who are specialists in rare, seldom offered *Haworthias* and *Gasterias*
<http://www.gasteria.org/index.htm> will get you to The *Gasteria* Reference Collection of North America. Breck Breckenridge is putting together a website for non-hybrid *Gasterias*. He provides general information and pictures
<http://www.ping.be/~pin04349/html/gasteria.htm> is another site with great pictures

Program

The Trees or the Forest

by Erik Gronborg

"In none of the arts as surely as in gardening can a man of moderately poetic temperament, moderate capacity of study, moderate command of time for the purpose, produce works of a distinctive character that shall be thoroughly respectable. The effort which has already cost some millions of Americans to obtain a wretchedly small degree of success in versifying, music, acting, drawing, painting, carving, embroidering, or a hundred of the smaller decorative arts, if it had been given to study in gardening would have secured a distinguished success"

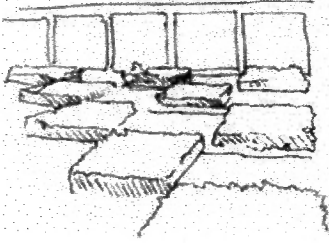
-Fredric Law Olmsted

Among plant lovers, including cactus and succulent enthusiasts, there is a real ambivalence over how we look at plants. Some people look at one plant at a time, seemingly able to ignore other plants or objects within sight. Others, such as artists believe that the significant visual experience comes from the total view in front of us, and that more important than the individual plant is the relationship of all the elements. One example of that

is the "staging" of the plant, such as the choice of the container: the material, stoneware, clay or plastic, the size relative to the plant, and beyond these decisions are such factors as the point of view (from which side do we get the best view) and the direction of the light.

Traditional Japanese understood the idea of enhancing the visual experience. They avoided clutter. The teahouse was without decoration ex-

cept for the TOKONOMA, the special display area in the single room, where only one object at a time was on display. It could be a scroll painting, or a vase with a simple arrangement of flowers and branches.

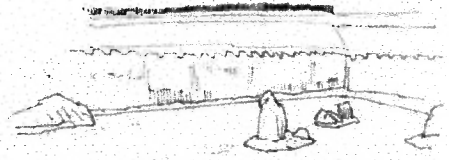


On the other side, we have seen examples of cactus collections packed on greenhouse benches like a warehouse. Orchid growers usually crowd their potted plants in greenhouses, and bring selected ones in to enjoy when they are in bloom. Art museums used to be like warehouses with paintings hung three high and only inches apart. In the last century we have witnessed a change in philosophy to emphasize the whole visual experience. Fewer objects are on display but each one is on a separate pedestal with a spotlight, each painting given so much space on the wall that no other painting interferes with the view.

A large part of our appreciation of plants is the understanding that they are part of nature, of the incredible diversity of our world. In it's natural environment we do not see the cactus in isolation. We see it in relation to a yucca, a bunch of grasses, growing in a crack in a rock, or as part of a large clump. All of these elements affect the way we see the cactus. It is the understanding of the importance of these relationships, and the desire to create some sense of order from all these

different parts, which are behind the creation of the gardens. A garden is not nature, though it is closer to it than are potted plants.

Creating a garden is art, just like painting a painting or carving a sculpture. It can be amateur art, using clichés, like painting by the numbers, and the bookstores have shelves of books and magazines telling how to do it. But in the hands of a creative artist a garden can be as beautiful and surprising as a great painting. The garden designer considers certain factors: the climate and nature of the site (temperatures, water, soil and topography), choice of suitable plants, which will grow in the site, and the culture, or style of the time and place. The gardener's sense of beauty and appropriateness is usually determined by the culture he or she is part of. For example the Italian formal gardens of the 16th century reflected the sense of order also found in contemporary architecture, painting, and literature, and they provided a suitable setting for the social life of the nobility. Similarly the Japanese Zen Buddhist temple gardens are closely related to other facets of traditional Japanese culture.



We live in a time of globalization, and we all borrow freely from any other culture and make it suit our purposes. In the creation of a satisfying and attractive garden, Japanese Zen gardens can offer us valuable lessons.

March Brag Table Winners

Anyone is welcome to participate in this activity. If you have a Cactus or other Succulent that is looking particularly good - we encourage you to bring it in for the "Brag Table." There will be small entry cards to fill out with the name of the plant (to the best of your knowledge) and your name. The plants will be judged by a knowledgeable member and 1st, 2nd, & 3rd place is awarded to plants based on their health, staging, rarity, difficulty of growth, and the subjective opinion of the person judging. A small stipend is awarded which can be used toward the purchase of plants in our sales area.

Judged by: Mark Dimmitt
Recorded by: Shirley Berry

Succulents:

1st *Dudleya candida*

1st *Agave lophantha* var.

2nd *Sanseveria* sp.

2nd *Hectia glauca*

3rd *Haworthia truncata*

3rd *Gasteria baylissiana*

Cactus:

1st *Copiapoa esposoensis*

2nd *Rhipsalis* sp.

3rd *Melocactus waraisii*

Thank you for participating!

Elibert Marshall

Kelly Griffin

Michael Buckner

Kelly Griffin

Kelly Griffin

Lee Badger

Don Patterson

Donnie Willett

D. Parr



Rebutia

by Tom DeMerritt

When I first volunteered to do Cactus of the Month on *Rebutia* our plant of the month official Jeff Harris stated that it had already been covered in the last year. Well not exactly I said. As we discussed this further, it was actually the South American cousin *Lobivia* done by Chris Miller. Both *Lobivia* and *Rebutia* had been proposed to be moved to the larger Genus *Echinopsis* but the International Cactaceae Systematics Group had elected only to lump *Lobivia* into *Echinopsis* and leave *Rebutia* separate. The taxonomy of this group has been argued continually and in 1951 renowned German botanist Curt Backeberg separated the group into

Rebutia, *Sulcorebutia* and *Weingartia*. All three of this Genus have similarities but they also have enough distinctions to justify different groups. For the purposes of this article I make frequent references to what has been perceived to be the closest cousin of *Rebutia*, which is *Sulcorebutia*. With regards to *Sulcorebutia*, Backeberg raised this genus from *Rebutia* to distinguish what he thought were enough differences in a group of *Rebutia* from Eastern Bolivia to

warrant a separate genus. *Sulco* is derived from the Latin: *Sulcus* meaning groove or furrow (english=*sulcus*, german=*furche*, spanish=*sulco*), which is what Backeberg saw as one of the chief distinguishing attributes of these plants "All species have a narrow oblong areole and either this is surmounted by a minute depression, or the tubercles taper obliquely upwards and are elongated or not uniformly circular." In

1895 Karl Schumann of Berlin Botanical Garden fame, named a new genus after P. Rebut a 19th century cactus dealer. The type species was *R. minuscula*. A bit more detail: Rebut had listed this species as *Echinopsis minuscula* in his



catalog. Schumann, recognizing the differences between this plant and *Echnopsis* (flowers do not arise from the areoles, but from between the tubercle rows, close to the base of the body and were more numerous than *Echnopsis*) split *E. minuscula* and raised it to the new genus: *Rebutia*. This entire groups of *Rebutia*, *Sulcorebutia*, *Echnopsis*, *Weingartia*, *Gymnocalycium* and *Lobivia* that grow in this region are stated to be in a rapid state of evolution and their

taxonomic structure will be argued for a very long time.

The new *Rebutia* group now is pruned down to 41 species, which has a distribution throughout the southern provinces of Bolivia and Northwestern Argentina on the eastern side of the Andes. It is a mountain dwelling cactus that grows from five to thirteen thousand feet, very high indeed for any cactus. The distribution is between 15 to 25 degrees latitude so the ultraviolet intensity is naturally higher than what San Diego's 33 degrees from the equator would be. Because this group grows in many inaccessible regions many new discoveries are occurring where new roads are being built and the land is still being explored.

Most species in the group are small plants, which can do just fine in no more than a 4-inch pot. The bodies are globular to short cylindrical stems. Many species can form good size clusters while others remain solitary heads. The tubercles are rounded in *Rebutia* whereas they're rhomboid, meaning parallelogram with no right angles and adjacent sides of unequal length with *Sulcorebutia*. Tubercles are evenly arranged in *Rebutia* where they're spirally arranged with *Sulcorebutia*. The spines are variable and often very colorful. *Rebutia* spines are brittle

and break easily while *Sulcorebutia* spines are hard yet also flexible. The flowers of these two are also shaped differently. *Rebutia* has triangular based bud scales that have axillary hairs and spines while *Sulcorebutia* has triangular based bud scales. *Sulcorebutia* has a sunken apex on the top of each head and *Rebutia* are rounded. Based on these obvious morphological distinctions the Genus *Rebutia* has more in common with *Echinopsis* and could be regarded as a sub group of that Genus. *Sulcorebutia* has many characteristics in common with *Gymnocalycium* so it could be integrated as a sub group of that Genus.



Sulcorebutia arenacea

Most growers of this group have the best luck keeping their plants somewhat pot bound in pots where the depth doesn't exceed beyond one third of the plants roots length. Optimal growing conditions vary. All the species need a gritty, well-

drained, slightly acidic cactus soil. It is recommended to be Lime and Gypsum free for this group with a ten percent loamy compost mix. They also need strong light, although generally not too much direct sunlight. They need good watering in summer, but you should allow the soil mixture to dry out between watering. The plants are kept watered and fed during the spring and summer months and then dry during the cold wet months of the year. If the plants

are pot bound then they can generally handle the outdoors of winter. If the pots have an excess of soil the cold and wet create fungus that leads to plant rot.

Rebutia bloom easily and have relatively large daytime flowers. Flowers are generally yellow to red, although some species have white ones. They come from the lower part of the stem. The flowers come in pulses throughout the spring and the intensity is said to be increased when emerging from a cold spring as though the plants are celebrating the end of dormancy.

Fertilizing should be applied conservatively and only in the spring and early summer. It should be high in potash and low in nitrogen. This promotes strong spines and healthy flowers. Bugs are an issue, as mealy bugs love this group. Red spider mites and sciarid flies can also infest the group. Generally a systemic insecticide early in spring will reduce the chance of infestation along with keeping the ant populations down, as they are not only transporters of mealy bug but also other fungus, which may cause rot in the plant. I use a systemic insecticide by the third watering every new year. If one

chooses not to use a systemic and pests appear then two applications of the systemic are needed, the second followed ten days after the first to ensure the eggs or larva are eradicated.

The plants can be grown from seed or from offsets if they produce pups. *Rebutia's* sensu lato (in the wide sense) are *cacti*, which provide pleasure from the beauty of the body and the flower. They are collected and admired world wide for the good reason that the plants offer so much to the collector. I chose to do this article because I too absolutely love this group. I found that when researching for this

article many of my own questions regarding the detail of *Rebutia* were answered

Please bring any specimens in for the general meeting and share with us for this cactus of the month.



Sulcorebutia verticillacantha

References:

- Cactus & Succulent Journal**, Vol. 73
- The Genus Rebutia**, Abbey Brook Nursery
- Cactus Odyssey, Journeys in Bolivia, Peru & Argentina**
- The Cactus Family**, Ed Anderson

Upcoming Events

2003

April 12-13 South Coast Cactus & Succulent Society Show & Sale, at South Coast Botanical Gardens, 26300 Crenshaw Blvd., Palos Verdes Peninsula, CA, 9am to 4pm. Displays by Selected Growers. Plant Sale. For information, contact Dick Hulett at 310-832-2262, airobatic@aol.com -- Come, enjoy & learn! (And buy plants!)

April 27th Earth Fair Balboa Park, San Diego

April 27th Mission San Luis Rey 5th annual Pepper Tree Day The inner sanctuary is open to guests in honor of California's oldest Pepper Tree. Gates open at 11:00 AM info.- (760) 757-3651 x-127

May 18 (Sunday) Epiphyllum Society of America's Show and Sale. Ayers Hall, Arboretum of LA County, Arcadia CA. Information: www.epiphyllum.org

June 1 Toronto C&S Club Show and Sale at Civic Garden Centre, Edwards Gardens, 777 Lawrence Ave. East, Toronto, Ontario, Canada. Sunday 10am - 4.30pm. Information from Dave Naylor 905-877-6013 or e-mail him at naylor@unforgettable.com

June 7th & 8th San Diego Cactus & Succulent Society Show & Sale

June 14-19 (Sunday through Thursday) CSSA 30th Biennial Convention, St Louis MO hosted by the Henry Shaw Cactus Society.

In 2003, the Henry Shaw Cactus Society will host the 30th Biennial CSSA Convention in St. Louis. From the welcome reception on June 14 to the farewell party on June 19, prepare for a full schedule of education and fun. Enjoy hunting plants at the BIG cactus sale, too. (No sales on field trip days.) Sunday and Monday are "Succulent Days," with over a dozen presentations by noted speakers. Sunday's special banquet speaker is Missouri Botanical Garden Director Peter Raven, who will discuss endangered cacti of the United States. Tuesday features field trips to Missouri Botanical Garden, Forest Park attractions, Cass Bonsai Garden -- even a riverboat cruise. Wednesday and Thursday resume with "Cacti Days" and more informative programs by a group of international scholars and botanical experts.

July 5-6 CSSA Show & Sale, Huntington Botanical Gardens, 1151 Oxford Rd, San Marino CA.

August 30 Huntington Symposium, Huntington Botanical Gardens, 1151 Oxford Rd, San Marino CA. Info: 626-405-2160 or 2277

August 31 CSSA Board Meeting, Huntington Botanical Gardens, 1151 Oxford Rd., San Marino CA.

2004

C&SS of New Zealand AGM and Convention, Palmerston North, New Zealand. Info from Frances Verrity at verrity@actrix.gen.nz

August 21 British C&SS National Show, Spalding Exhibition Centre, Springfields, Spalding, Lincs, England.

November (3-week tour tentatively planned for November 2004) CSSA Tour to Chile, home to *Copiapoa*, *Eriosyce*, *Eulychnia* and others. See more details on page 31. Watch for further announcements. Contact: Dan Mahr

San Diego Cactus & Succulent Society Inc.
P.O. Box 33181
San Diego CA 92163-3181



Espinas & Flores

Editor: Paul Steward
(858) 486-0535
manuscripts and mail to:
12620 Tustin Street
Poway CA 92064-6037
psteward@pacbell.net
eyf2000@aol.com

San Diego Cactus & Succulent Society Executive Board Members

President: Pam Badger (619) 589-1223
Vice President: Jeff Harris (619) 294-5708
Secretary: Christine Tratnyek (619) 461-0737
Treasurer: George Plaisted (619) 583-9551
Ex Officio: Tom DeMerritt (858) 270-5544

Directors

Lee Badger (619) 589-1223
Phil Favell (760) 471-8944
Mark Fryer (619) 795-1020
Joe Kraatz (760) 758-7042
Spencer Maze (858) 454-1870
Terry Parr (619) 460-9111
Herb Stern (619) 223-9134

Standing Committees & Sub Committees

Conservation: Joey Betzler & Kelly Griffin
Education & Exhibits
Brag Table: Shirley Berry & Kay Quijada
Plants of the Month:
Lee Badger & Jeff Harris
Summer Show: Tom Knapik, Jeff Harris &
Susan Hopkins
Winter Show: Ed DeLollis
History: Terry Parr
Liaison
Balboa Park Desert Garden: Susan Hopkins
CSSA Affiliate Rep: Kelly Griffin
Quail Botanical Gardens: Phyllis Flechsig
San Diego Botanical Garden Foundation:
George Plaisted
San Diego Floral Association:
Elizabeth Glover
San Diego Wild Animal Park Baja California
Garden & Succulent Collections:
Chris Miller
Library: Tom Birt & Phil Bunch

Membership: Collette Parr
Mailing: Pam Badger & Jeff Harris
Plant & Seed Exchange
Plants: Michelle Heckathorn & Sara Schell
Seeds: Kelly Griffin
Plant Sales & Supplies
Annual Sales: Tom Birt
Auction & Holiday Plants:
Lee Badger & Tom DeMerritt
Benefit Table: Lee Badger
Monthly Plant Sales:
Jeff Harris & Joe Kraatz
Monthly Supply Sales:
George & Jerry Plaisted
Publicity: Tom DeMerritt & Stan Yalof
Programs: Kelly Griffin
Reception: Ethyl Standish
Regalement
Monthly: Lee Badger, Rudy Lime &
Stefy Mangold
Picnic: Laura & Tom DeMerritt

GASTERIA IDENTIFICATION MATRIX

<i>Gasteria</i>	Plant Shape	Plant Size (mm)	Leaf Pattern	Leaf Shape	Leaf Upper Surface	Leaf Lower Surface	Margin Edge and Tip	Juvenile Characteristics	Remarks	Flower Color	Bloom period *
<i>acinacifolia</i>	Stemless, decumbent to erect rosette, smooth skin	250-750 mm T, 650 W	Dark green w/ dense white spots in transverse bands	Sickle or spear shaped 220-600 mm L 45-100 mm W	Channelled, w/ plane towards tip	Convex w/ distinctly excentric keel	Notched, tip tapers to a point	Distichous, strap shaped, spreading to erect, distinct bumps, tip pointed or blunt w/small point	Solitary or dividing at base	Pink	September through December
<i>batesiana</i>	Distichous turning to rosette in maturity, stemless, decumbent to erect	30-100 mm T, 80-300 mm W	Dark green with dense white spots arranged in transverse bands and dense wrinkled white or green tubercles	50-80 mm L, 15-40 mm W at base, triangular or linear shaped	Channelled, w/ plane towards tip	Convex w/ excentric marginform keel	Notched on edge like a saw, tip pointed	Strap shaped leaves, densely bumpy, tip rounded or blunt w/short sharp point	Forms groups, rarely solitary, leaves are brittle, can be recurved	Light pink	October through December
<i>baylissiana</i>	Stemless, distichous, decumbent to erect	15-40 mm T	Green w/ dense white cartilaginous tubercles	25-55 mm L, 20-23 mm W at base, strap shaped	Plane or convex	Convex	Bumpy, becoming smooth towards the tip, tip is blunt or notched	Strap shaped leaves, bumpy rough skin		Reddish pink	September through October
<i>bicolor</i>	Distichous to spiraling, decumbent to erect w/ short leafy stem	50-500 mm T	Dark green w/ dense white spots arranged in obscure transverse bands	30-400 mm L, 15-60 mm W at base, strap shaped	Plane to convex, channelled in dry season	Convex when distichous, w/ excentric keel when spirally arranged	Minutely notched, semi-translucent white margin, point is blunt	Leaves flat or erect spreading, strap shaped, bumpy, tip is blunt w/small sharp point	Rarely not spotted, stem 200 mm T	Light pink to white	July through November
<i>brachyphylla</i>	Distichous, stemless, decumbent to erect	25-230 mm T, 75-230 mm D	Smooth dark green leaves with dense white spots arranged in obscure transverse bands	15-230 mm L, 22-80 mm W at base, strap shaped	Convex to flat	Flat	Wavy & finely notched becoming smooth towards tip, tip can be pointed or blunt	Strap shaped, bumpy dense white spots, blunt tip	var bayerii has incurved tip	Pink	September through October
<i>carinata</i>	Distichous at first, stemless, may transition rosette, decumbent to erect	Forms dense groups 150-600 mm D, 30-180 mm T	Green with raised or immersed white spots in obscure transverse bands	Triangular, 30-180 mm L, 10-50 mm W at base	Plane or channelled	Keel or convex	Finely toothed, pointed tip	Distichous, erectly spreading strap shaped leaves, smooth or bumpy, tip blunt w/small sharp point	Skin can be smooth or bumpy	Pink	July to November
<i>croucheri</i>	Smooth, stemless, decumbent to erect spiraling rosette	250-400 mm T, up to 600 mm W	Dark green to gray green w/ dense transverse bands of white spots	Triangular, strap shaped, 200-360 mm L, 30-100 mm W at base	Channelled, w/ plane towards tip	Convex w/ distinctly excentric keel	Notched, bumpy, tip blunt or pointed	Leaves distichous, strap shaped, widely spreading to erect, smooth or rough skin, pointed tip	Clumps from base	Pink	November through February
<i>disticha</i>	Stemless, distichous, decumbent to erect, rough skin	25-230 mm T, 75-230 mm D	Green w/ dense white spots in irregular transverse bands	60-170 mm L, 30-45 mm W at base, strap shaped	Convex to flat, channelled during dry season	Convex to flat	Irregularly wavy and notched, blunt tip	Leaves wide spreading or recurved, bumpy with truncated tip		Pink to reddish	July to February
<i>ellaphieae</i>	Stemless decumbent to erect rosette, rough skin	15-40 mm T, 50-160 mm D	Dark green w/ dense white bumps arranged in irregular transverse bands	Triangular to spear shaped, 20-50 mm L, 10-20 mm W at base	Channeled & flat in upper 3rd	Convex w/ distinctly excentric keel	Finely toothed, with pointed tip	Distichous, strap shaped leaves, erect at first, becoming flat or recurved, bumpy skin	Inner leaves erectly spreading, outer leaved recurved	Reddish pink	January to February
<i>excelsa</i>	Stemless decumbent to erect rosette, smooth skin	300-600 mm T, 600-750 mm D	Dark green w/ indistinct white spots in transverse bands	100-400 mm L, 100-180 mm W at base, triangular to strap shaped	Channelled, w/ plane towards tip	Convex w/ distinctly excentric keel	transparent very sharp notches, pointed or blunt tip	Distichous, densely whit spotted, spreading out widely, strap shaped, lower surface somewhat rough, tip blunt w/small point	Solitary, spots may be barely visible, erect spreading to somewhat recurved	Pale pink to white	November to February
<i>glomerata</i>	Stemless, distichous, decumbent to erect	15-40 mm T, 20-50 mm D	Gray-green, rough	15-20 mm L, 15-20 mm W at base, strap shaped to oval	Notched in upper third		Tiny bumps, tip is blunt	Strap shaped, distichous, erect at first, becoming flat or recurved, slightly bumpy		Pinkish red	September
<i>nitida</i>	Stemless, decumbent to erect, distichous (may become a rosette), smooth & shiny	60-200 mm T, 50-280 mm D	Dark green with faint to dense white spots arranged in irregular transverse bands, juveniles unspotted	16-180 mm L, 25-80 mm W at base, triangular to spear shaped	Channeled	Somewhat convex w/ distinctly excentric keel	Smooth or indistinct notches, tip comes to a point	Distichous, strap shaped, erect spreading at first becoming flat or recurved, skin bumpy. Sometimes forms confluent ridges, dark green, rarely spotted. Tip is blunt w/small point	Solitary or proliferating from base	Bright reddish pink	December to February
<i>pillansii</i>	Stemless, distichous, decumbent to erect, rough skin	50-200 mm T, 60-400 mm D	Green spotted with immersed tubercles, strap shaped	20-200 mm L, 15-50 mm W at base	Somewhat channelled during dry season	Convex	Bumpy, tip pointed or blunt		Proliferates from subterranean stolons and forms dense clumps	Pink	November to April
<i>pulchra</i>	Stemless, decumbent to erect rosette, smooth skin, distichous turning to rosette	200-360 mm T & same Diameter	Sword shaped, dark green w/ dense white spots in transverse bands	240-360 mm L, 25-40 mm W at base	Distinctly channelled (more so during dry season)	Somewhat convex, indistinct excentric keel	Minutely notched, tip tapers to a point	Distichous, erect spreading leaves, strap shaped, tapering to a point, distinctly bumpy	Solitary or forming small groups	Reddish pink	September through October
<i>rawlinsonii</i>	Pendulous stems, distichous or spirally arranged	1 m T, rarely branching	Green not spotted or with faint white spots	30-80 mm L, 10-25 mm W at base, strap shaped	Plane to convex,	Convex w/o keel	Sparingly notched, tip is blunt and recurved			Reddish pink	October and occasionally at other times of the year
<i>vlokii</i>	Stemless, distichous when young, then spiraling	140 mm D	Green w/ dense white spots in obscure transverse bands, rough skin	50-90 mm L, 20-30 mm W at base	Flat to slightly convex, becoming channelled in dry season	Convex	Very bumpy, growing smooth towards the tip, tip pointed or blunt w/ excentric point	Strap shaped leaves, tip blunt w/small point	Skin is rough w/ short hard bumps	Reddish pink	January to February

Matrix based on plant descriptions in *Gasterias of South Africa* by E.J. van Jaarsveld

*Bloom periods based on data from reference, may differ in local area

Decumbent: lying flat with end curled up
Distichous: leaves oppositely arranged in two verticle rows
Excentric: off center, one sided
Keel: a narrow ridge on the underside of a leaf
Recurved: curved or bent backwards

Legend

w/ = with
T = tall
D = diameter
W = wide
L = length