Growing rebutias - a recipe for success

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Although I disagree with recent decisions to make a "supergenus" out of *Rebutia. Sulcorebutia, Weingartia* and others, for the purposes of this article, ***Rebutia*** refers to all three together.

Since rebutias are among the easiest plants to grow in all of cactusdom, when I hear that someone is having trouble cultivating these beauties, a few things come to mind, items remembered from disasters of my own making.

For the last eight years I have acquired a very large collection of *Rebutia, Sulcorebutia, Weingartia,* and miscellaneous other South American genera. The collection contains about 2000 plants, which are grown without the benefit of a greenhouse in open-sided frames shielded from rainfall by removable flip-up lids. The plants are outside from about April 15 through early December and spend the winter in black plastic trays on shelves in an integral garage that has temperatures as low as 40°F. There is only incidental light from the garage-door windows, and the plants receive no water and little air circulation. The search for spider mites takes place every other week or so; if some are found, a light spray of a miticide is applied to the infected area and surrounding trays only.

General Comments

Rebutia sensu lato is native to central Bolivia and northen Argentina. *Rebutia* sensu stricto and *Sulcorebutia* inhabit the region of 5,000-14,000 feet, while *Weingartia* prefers lower altitudes. The habitats are much closer to the equator than Pittsburgh, so these plants get a high dose of ultraviolet light, resulting in much more pronounced spine formation. Many plants in the wild are single-headed, spend much of their life partly sunken into the surrounding soil-surface and have only enough vitality to produce one or two flowers at a time. Trying to find some of these plants in habitat is only possible during the flowering season. Weingartias on the whole tend to be much larger in size and correspondingly more visible. Looking at habitat photos of many of these plants gives one the sense that many are quite similar until grown on the plant benches of Europe and North America, when the species differences start to appear as the dense spine development starts to diminish with decreasing light intensity. The appearance of the large puffed-up plants sold by some wholesalers is not the real-life situation. Large clumps of plants that seem to win so many prizes at shows are nice to look at but are not even close to the true appearance of the wild plants, which often struggle to survive on minimal resources.

Most of the problems involved in growing *Rebutia* are attributable to the wrong pot or the wrong potting mix.

Pots

Looking at the root system on a rebutia, try to make the depth of the pot not much more than one third greater than the length of the roots. Many rebutias are quite shallow-rooted, especially the small-headed types in subgenera Aylostera and Rebutia. Trying to grow these plants in a deep pot with a thick layer of soil at the bottom is a recipe for disaster. Examining the carcasses of plants lost early on in my cactus career has reinforced the notion that the root systems inhabited only the top third of the pot in many cases. For such species a type container called a bulb pan is most effective. Bulb pans, either plastic or clay, are half the height of a regular pot of the same width and are shallower than azalea pots, which are three quarters the height. In the case of mediolobivias and many sulcorebutias, a different sort of pot is necessary. These plants most often have a long, carrot-like root system and do well in deep - but not wide - pots, such as rose pots. Clay or plastic pots are suitable for all rebutias, but there must be a drain hole for the exit of excess water.

Growing Medium

Once a proper pot is selected, the choice of a potting medium is a subject of considerable debate by specialists and beginners alike. Mac Clarke, a former director of CSSA, has suggested that cacti and succulents could be grown in ground-up rubber boots, and I suspect he is right. A more conventional approach would be to use a conventional potting mix and blend it with some sort of aggregate to improve drainage. A good mix for all rebutias is 50% pumice, 25% perlite, and 25% of an organic ingredient. Various things can be substituted in place of pumice, and the amount of organic material can be varied considerably in both type and quantity. The

cry "eschew peat" has been heard on internet discussions groups, but peat-based potting mix is the organic that I use. Pennsylvania native soil is hard clay, and does not work very well. Once upon an early time I tried a blend of peatbased potting soil and coarse sand and gravel in plastic pots and lost lots of roots an lots of plants. The important thing to remember is to find a blend that works in one's particular circumstances and climate conditions and stick to it in spite of any suggestions heard or read about. Fast drainage is the key to success.

Water

The old adage that more cacti are lost by too much water than from not enough definitely applies to rebutias. However, the use of a fastdraining potting mix tends to alleviate many of the problems. Large plants should be grown in clay pots to bleed off any excess water. The usual watering regimen is to give a small drink when the plants are first put outside, and after the onset of flower buds give a thorough watering until the water runs out the drain hole. The way to determine subsequent dryness is by the "heft" method. Get a feeling for the weight of the pot, soil, and plant when absolutely dry, and water the plant when it seems to weigh about right. Hold back on the water after the end of the flowering period, but not enough to dehydrate the plants and kill the fine roots. Sometimes Pittsburgh summers can be a bit cool, and the plants keep right on growing through the summer with no obvious dormancy period. Ease off on the water - especially for the larger pots - about 60 days before the end of the growing season, especially if plastic pots are used. Smaller pots can be watered closer to the end of the season. Residual dampness in the potting mix seems not to cause much harm through the winter dormancy period. I use plain old city tap-water, but rebutias seem to like rainwater better.

Fertilizer

Plants in habitat see little in the way of applied fertilizer, so I tend to grow my plants that way. Fertilizer is applied only twice in a growing season, once with the second watering and once in the early fall after the summer dormant season. There are lots of choices of fertilizer, but I use standard old MiracleGro at a halfteaspoon per gallon, applying it until it drains out the bottom. I tried a few other blends, but this one seems to do as good a job as most.

Bugs

Insects are a fact of life in gardening. Whether it's roses or cacti, there is always some-

Figure 1. Young plants in the author's collection

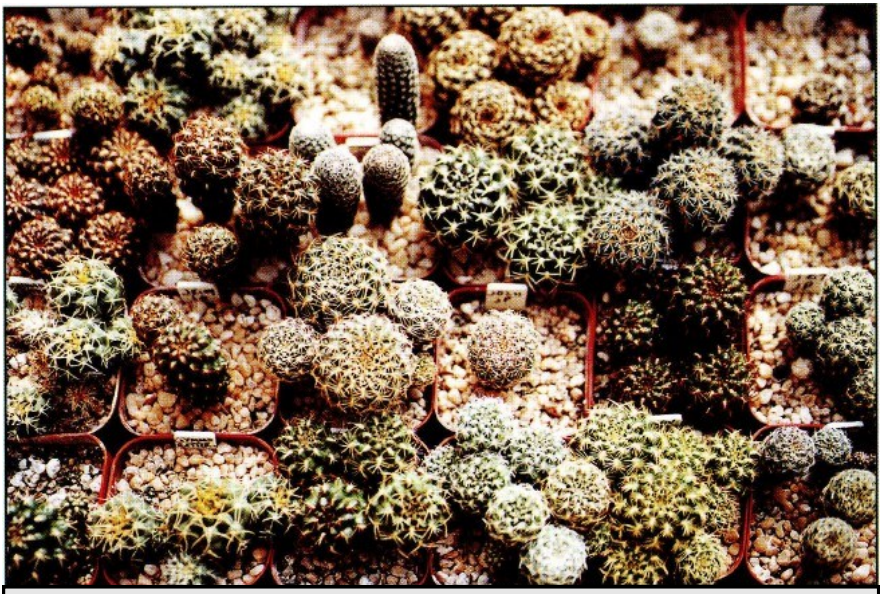

Figure 2. More of the author's plants, showing the range in stem form in Rebutia and Sulcorebutia

thing out there waiting to eat our beautiful plants. But most insecticides are dangerous not only to humans but also to pets and other wildlife exposed to them. If you read the Pesticide Information Profiles on Extoxnet (http://ace.orst.edu/info/extoxnet/pips/ghindex. html) you would never want to use one of these products. However, in some instances, wanting to use one and actually using one is a matter of collection survival. About four years ago I lost part of my sulcorebutia collection to a winter root-mealy-bug plague. So now, at least for the time being, it's Cygon 4E, 30cc to the gallon (a little bit more than one teaspoon), on October 1, and I wear a cartridge respirator when I use it and wait until the wind blows away from the neighbors. I never see insect pests anymore, except for the occasional spider mite. Other types of insecticides work as well on rebutias, but almost all are organophosphates similar to Cygon, are hazardous to your health if your become overexposed, and are smelly, to put it mildly.

Flowers

If you have ever seen a clump of *Rebutia heliosa* in full bloom, you will never walk away from the hobby. While the spines and body shapes are interesting, it's the flowers that get you hooked. Many of the real rebutias will bloom at the second year from seed, often from plants only a half inch in diameter, and with flowers larger than the plant. Typical flower colors are all the colors common to cacti in general, which means everything hut blue and green. Most flowers are a fleeting experience at best, often lingering for less than a day, and often missed entirely by those of us having normal working hours. I used to take certain short duration bloomers to work just to be able to see the flowers at all. Weekends never seem to coincide with the plants you most want to see bloom.

Propagation

Rebutias can be grown from seed, or plants can be produced by rooting offsets in the usual manner. When growing from seed, special precautions should be taken to produce true-to-name seed-stock, since hybridization is a very real possibility. Unfortunately, many sulcorebutias and weingartias are solitary unless the growing point is purposely damaged to encourage offsetting, so the only way to propagate is by careful seed production. The seeds that I harvest from my own plants are usually thrown away to prevent the distribution of bastard plants. The only real use for these seeds is to experiment with seed-raising techniques. Even plants raised

for possible grafting stocks may find their way to the collection table with an erroneous label attached. The only truly accurate propagations are offsets of field-collected plants, a definite problem these days because of CITES regulations.

When growing *Rebutia* from seed several important factors need to be considered before sowing. The first concerns the age of the seed. Sulcorebutia and mediolobivia seeds tend to lose their viability after only a few months, though the others are good for a while longer. Many of my initial attempts to raise *Sulcorebutia* from purchased seed met with zero germination using any method of sowing. The second concern is what to do with all of those healthy plants that result from good sowing practices. Good seed will germinate at a rate of 80-100%.

There are a variety of equally good methods for germinating seeds of rebutias. Baggies, trays and domes, coffee cups, and yogurt containers all do a good job of producing seedlings if the right conditions are met. Here is what works for me. The soil mix is a 50/50 blend of clay soil conditioner (really just calcined kitty litter) and a commercial potting mix with coir (coconut fiber) substituted for the peat. First strain out the bark pieces, big lumps and fibers. The coir blend helps get rid of the pesky sciarid flies common to peat mixes. Moisten the mix thoroughly and microwave it in a covered ceramic dish for 20 minutes. The seed pots are about two inches square and the same in depth, and they are new to avoid any incidence of algae or fungi found in old pots. Put a little gravel in the bottom for drainage, add the cooled potting mix, tamping down slightly to make a level but not packed-down surface. Treat the seeds before sowing with a dry rooting hormone that contains Thiram fungicide (this is for the fungicide and not the hormone) and sow them on top of the mix. Soak the pots for 10 minutes in a tray of warm water with the level high enough to reach just helow the top of the sowing mix, then drain the excess water from the pots. No other fungicide is used.

The germinating trays are 10" by 20" standard black plastic nursery trays without holes, with a separate plastic dome over the top. The trays are placed under a two-tube fluorescent light fixture with 40W daylight bulbs, the top of the plastic dome almost touching the light fixture. It is important to use 40W tubes and not the power-savers that may be as low as 32W. The lights remain on 24 hours a day, giving a temperature in the tray at seed level of about 80-85 degrees.

Fresh seed of weingartias, aylosteras and *Rebutia* sensu stricto could take place in as little as three or four days, while mediolobivias and *Sulcorebutia* take up to three or four weeks. If there is no germination after four weeks, that pot can be considered a failure. After germination is completed in all the pots, the dome can be raised slightly for air circulation, and a little dilute fertilizer can be used to encourage faster growth. Be careful of the formation of a layer of algae or the "green slimies" on the surface of the soil. When this stuff dries out it can pull the seedling roots out of the soil, and it severely restricts the growth of seedlings in any case. The seedlings can be transplanted when they reach 1/4" (6 mm) or so. The transplant mix should be a bit finer in texture than the standard plant mix, but still free-draining.

A word about further growing under lights is necessary. Seedlings of weingartias and rebutias (sensu stricto) seem to do well under 40W daylight fluorescent lights at about 5-6 inches from the top of the pots. Sulcorebutias and mediolobivias do not do well under lights and should be introduced to natural sunlight as soon as possible. However, if the pocketbook can afford a 400W metal halide light fixture, this works for all the plants of the Rebutia group, but be careful not to toast the seedlings. At a distance of 18" from the plants, there is more than enough heat to fry them. A gentle fan is needed to move the hot air away from the trays at all times.

Conclusion

Rebutia sensu lato is a worthwhile genus to collect. By choosing the right pot to start with, and paying attention to some of the suggestions outlined above, it is easily possible to maintain a large and healthy collection of these plants in a relatively small space.

After all these years of growing cacti outside, happy to say that my first greenhouse is nearly complete. Of course, it's about half the size that it should be, but that's the way it goes.

And finally, thanks to all of you who have helped me over the years. You know who you are. And remember to buy and read a good cactus book or two. If you can't have ALL the plants you want, at least enjoy their pictures.

All photos are by the author.

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Originally published in C.& S.J. USA Vol. 73 2001, N° 5 (p. 258-261)
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