Most growers of succulent plants have their own special techniques and soil mixtures. This is certainly also the case with all collectors who grow ceropogiads. But I also know that many are put off by failure to grow them. Apart from a few species that will adapt to most kinds of climate and growing conditions, most species require special attention, while some are virtually impossible to keep alive for long periods.

I have grown them for some twenty years, and have through losses developed a few techniques to keep them growing and flowering for long periods. These I would like to share with those who are still trying to establish a way to keep them alive.

Introducing new material.
New plants can be established in a collection in different ways.

1) Growing from seed.
Ceropogiads, like most other asclepiads, hybridise easily when grown together with other species, and seeds collected in a plant house may well produce hybrid offspring. The best seeds to use are usually those collected from plants growing in nature, but seeds produced by hand pollination are just as good.

I always use sterilised soil. This I do with boiling water, which is poured into the seed pot. In this way the pot and the soil will be cleaned. Sterilising in a microwave oven is also fine, and when a clay pot is used, it could be done in an oven too.

Let the soil dry out for a couple of days, but enough moisture must remain for germination. When ready, loosen the top layer, and level it. Seeds are sown well spaced on the surface, and then covered with a thin layer of sterilised soil. The pot is then placed in a plastic bag (those used for storing food in the fridge, or for wrapping sandwiches are ideal). Pull the bag right down, and preferably, place a rubber band around the pot to hold the bag tight. Place in a sunny window. Moisture should start to condense on the plastic within a day. Some seeds may germinate within days, others may take weeks, so do not give up after a month. Never sow more than one species in the same pot, as they may take different times to germinate. Once most seedlings are germinated, remove the plastic bag. Should any rot appear, spray with a fungicide, and remove rot-
ted seedlings. As soon as they start to grow, fertiliser may be applied. I normally leave the plants in the seed pots for at least one year before transplanting.

**Saving seed**

Where more seeds than needed are available, some may be saved for later use. Ceropogia seeds do not remain alive for a very long time when kept at room temperature. Often, after a year, no seedlings will result from such seeds. Seeds can however be saved for extended periods by keeping them at subzero temperatures. Exactly how long, is not known to me, but I have had excellent results after 4 years in the domestic deep freeze. It is important to keep them very dry. I place them in at least two layers of plastic bags, each one sealed individually. In this way plants lost can be replaced even after a couple of years.

2) **Rooted plants, seedlings or cuttings.**

Should you be lucky to receive seedlings or rooted plants, see section dealing with soil mixtures and potting.

3) **Unrooted cuttings**

Plants are often received as cuttings, and rooting them may sometimes be problematic. Some growers root them in soil, sometimes making use of rooting hormones. I root them in water. Most species, even those with tubers, can be rooted in this way. It is of great importance to work in a very sterile way. Prepare the cutting by slicing it off just below a node. Some species will only root from a node, while a few will grow roots on any part of the stem, even from the cut surface. I use small bottles with dark glass. We get here in South Africa Marmite and Bovril in little brown pots, and I use only these. Clean them thoroughly by pouring boiling water in them, or boiling them in a pot, or in a microwave oven. Discard this water and fill with fresh boiling water. Let it stand until completely cold before placing the cutting in it. Stand in a sunny spot. After a week, and then at weekly intervals, remove the cuttings, discard the water, and go through the same sterilising procedure as above, cleaning first, and then filling with sterilised water. Inspect the cuttings for signs of rot. If it is only the very bottom, leave it, but if the node has rotted, cut off below the next node. I always wash them under a running tap, and if slimy, rub it off with the hand. Be careful though, should any signs of roots appear, do not damage them. The tuberous ones will often start with a thickening of the bottom part of the stem, from which roots will develop. Most species will root within a month – I have had cases where roots appeared within a day. But be patient, some may take a very long time to root.

Once the roots start to grow, allow them to develop well before potting.

I would like to point out to collectors that there is no need any more to remove plants from nature. By taking sufficient cuttings, one can introduce most plants into cultivation by rooting them.

4) **Grafting.**

It is a well-known practice amongst stapeliad grow-
The second method works well for species with medium diameter stems. Here the cutting is grafted onto another Ceropegia stem. I use a *Ceropegia haygarthii* for the rootstock. It should be a well-rooted and growing plant. The bottom end of the cutting, and the top part of the rootstock (which is cut off about 10 cm from the ground) is cut at an angle of about 60°, i.e. sharp. Across this cut, more or less in the middle, a cut, about 1 cm deep, is made into both cutting and stock. Pressing the two cut ends together (it will now form a continuous stem) and towards each other, they will slide into each other. The area surrounding the graft must be sealed to prevent drying out. I use sticky tape, winding it several times around both pieces of stem to seal and support the cut. If the cutting is long it will need some support. Keep in a cool place until growth starts. The rootstock may start growing side shoots below the graft. These should be removed immediately after they appear. I have used this method for *Ceropegia somalensis*, which would not root.

My friend Ralph Peckover developed the first method, and it works well for some species with thin stems. Here a piece of stem is grafted onto a ceropegia tuber, preferably the old reliable *C. linearis* subsp. *woodii*. The stem is “sharpened” at the bottom, by removing slices from two sides, to create a wedge. Make sure the wedge end is more or less straight. Across the top of the tuber, cut a slit about 1 cm deep. With thumb and forefinger press from both ends of the cut – it should open up. Push the wedge of the cutting well into this cut, and release. If a long piece of cutting is used, some support may be required to keep it up straight. Repeat if the first attempt fails. Make sure the top surface of the tuber is well above ground level to prevent water running into the cut area and contaminate it. I have used this method for *Ceropegia occidentalis*, which seldom survives for long on its own tuber when cultivated.
Pot and trellis
Most Ceropegia species need some support to climb onto. I have found that loose supports like pieces of wood, wire etc which are pressed down into the soil can be easily dislodged from the pot, and may cause some damage to the plants, especially tuberous species, which, when the stem is broken off at the tuber, may not grow new stems again. I use only large (17.5 cm, 7 inch) pots. Builders here, and I believe all over the world, use, what is called “brick force”, between layers of bricks. This is more or less two parallel pieces of wire, tied together at intervals with short pieces of wire. The distance between them depends on whether it is used for a single layer, or double layer of bricks. I use the ones for single layers, and cut them at lengths of about 75 cm, depending on the spacing of the cross wires, to use as a trellis. On one side of the pot, I drill two holes in the bottom, through which the two loose ends of the trellis are pushed. The ends are then bent inwards, so that they cannot come free from the pot again. Near the top of the pot, where the wires of the trellis lie against it, a further two holes are drilled, and the trellis is here too tied to the pot with a piece of wire. The pot can now be lifted up with the trellis, even when filled with potting soil.

Potting medium
I suppose there are as many potting mediums as there are growers, and the medium described here I have used with great success to grow both ceropegia and stapelia species. But use what you find works for you. I use a mix of 45 parts sifted river sand, 45 parts sifted garden compost and 10 parts agricul-
Potting plants

The three main root groups are potted differently. The tuberous ones I pot with most of the tuber above the potting medium. In nature tubers lie just below the surface of the soil, and are often found exposed as a result of erosion. The species with fusiform roots are potted with the roots spread horizontally, just below the top of the potting medium. In nature they are normally found spread out just below ground level, often in the layer of compost found under the host shrub. The species with fibrous roots are potted with roots going more or less down into the potting medium. They dry out more easily, and prefer to penetrate down to where some moisture is trapped in the lower soil layers. In most cases they do not need very deep soil, so I fill the bottom third of my large pots with drainage grit, when using the soil – compost mix. When using the husk – Styrofoam mix, I fill the entire pot with it.
Feeding the plants
I have found that most species react well to regular feeding. I use two different types of feeding, alternating them. An abstract made from kelp is available here. Apart from being organic, it has a high content of iodine, which, when absorbed by the plant, acts as an insect repellent. I also use a mixture called Multifeed, which, apart from some mineral salts, contains most trace elements. I only use rainwater, as our household water contains much chlorine, which tends to build up in the potting medium.

Where to grow them
Most ceropegias are found in nature growing in the protection of some host shrub. Most of the plant is thus mostly in semi shade. They do not like direct hot sunlight, but need good light to grow healthy.

How to keep them for a long time
Ceropegias vary from highly succulent to those that are not considered to be succulents at all. Some grow in very arid situations, while others may be found in damp cool spots. In a large collection it is not possible to simulate natural conditions. These are in any case not always known. So I treat them all in the same manner, keeping them rather more dry than wet. Most go into a dormant state in winter. Then they should be kept dry. One problem period is always spring, when one has to decide when to start watering them. Some species like C. multiflora and C. crassifolia dislike to be watered before they start to grow, and will often rot if watered too soon. It is in most cases the best to wait until the plants show signs of new growth before watering.

To grow any particular clone as one single plant is also chancy. Should it start to rot, rooting what is left is often not successful. The best is to make duplicate material of all plants, using the methods described above, while the plants are still growing well. This is one of the reasons why I use larger pots – up to four plants can be grown in the same pot, all mostly of the same clone. See also under cultivation from seed for seed preservation.

Diseases
Ceropegias are prone to attack by the same diseases encountered in stapeliad and other succulent collections. Try to keep the collection insect free. Mealy bug is a willing traveller. So, when introducing newly received plants, clean them before potting. I scrub all new arrivals with soapy water, to remove protective layers on insects, and then dip them in a mixture of insecticide and fungicide. Red spider mite is also a pest, and one should always be on the lookout for them. A spray is available which makes females sterile, and kills the eggs. Scale insects are a pest difficult to get rid of. An oily solution can be used, but I found the soundest way to get rid of them is to cut away all infested parts of the plant, and to burn these. Mildew will often attack the inflorescence of some species. Spray whenever noticed with a fungicide.

I trust these notes will help some collectors to grow these wonderful plants, making them more common in collections. I would like, if possible, to help with problems not discussed. I can be contacted at the address given at the beginning of this article or by e-mail.