Growing succulents under cover in South Africa

The cultivation of the asclepiads

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The Asclepiadaceae or "milkwort family" includes many succulent species, as well as a wide range of non-succulent creepers, herbs and shrubs. According to Dr Peter Bruyns --- a renowned asclepiaphile(!), there are about 40 genera in the family Asclepiadaceae which are characterised by succulence, with an approximate total of 900 succulent species. Most succulent asclepiad genera include stem succulents within the Tribe Stapelieae (name derived from the familiar genus Stapelia, to be referred to as "stapeliads" in this article).

Succulent genera belonging to other asclepiad tribes (apart from the stapeliads) which have succulent leaves include several members of Ceropegia and Hoya, and those with mainly tuberous underground organs, notably Fockea, Brachystelma, Raphionacme and Ceropegia.

Because many stapeliads, especially the larger flowered species, have blooms with both the scent and hue of rotting meat, eg Stapelia nobilis. S. leendertzii, this minority has earned the Stapelieae the rather unsavoury common name of "carion flowers". This dubious claim to fame may lead the less informed grower to suspect the presence of a corpse on the premises when such flowers open for business! Such meaty characteristics serve to attract flies to the blooms. These otherwise unsophisticated insects perform an unexpectedly complicated pollination ritual. This process (too complex for coverage here) can only be emulated by experts using an intricate technique, aided by a microscope. Broadly speaking, cross-fertilisation involves the transfer between the flowers of separate plants of "minute pairs of pollen sacks" called pollinia. These have to be carefully "unslotted" and "re-slotted" into appropriate parts of the floral anatomy.

It should be noted that flowers of other stapeliad species emit a wide and fascinating variety of scents other than the smell of rotting meat, eg scents that closely resemble urine, manure and honey (to name a few).

*Huernia hystrix* in cultivation. Note the thick layer of white gravel and decorative layout of stones around the moisture-sensitive stem bases.
With few exceptions, such as certain hardy Stapelia, Orbea and Euphorbia species, stapeliads are, of all the succulent groups, the most challenging to grow. By varying degrees they are susceptible to virtually the entire range of pests and diseases known to afflict succulents.

Growth in the natural habitat

In the hot arid lands, these cryptic plants are found concealed in the shelter of scrappy shrubs, in the lee of rocks, or occasionally inside sheltered rock crevices. The robust and upright species of Hoodia and (to a lesser extent) Trichocaulon (reminiscent of columnar cacti and euphorbias) are unlike most other stapeliads, and normally occur in fully exposed environs. These habitat observations provide useful pointers toward the requirements of stapeliads in cultivation.

Light and temperature

All stapeliads, except Hoodia, Trichocaulon and a few other minor genera, should be kept under shade cloth of about 50% reduction during the hot part of the year, i.e. if the aridarium (see McDowell 1987a) has a fully translucent roof. Plants should only be allowed exposure to full sun during the early morning or during the coolest times of the year. Too much sun is indicated by bronzing of the stem, sometimes with the drying up of the stem edges and/or tubercles.

The secret to success with stapeliads is to ensure shaded conditions with a high temperature. The aridarium should be positioned where it gets maximum day-length of sun.

Another way of maintaining high temperatures beneath shaded, covered conditions without resorting to artificial heating, is to close off the traditionally open aridarium sides with glass or fibre glass. Make provision, however, for vents that can be opened during excessively hot weather. The resultant diminished ventilation and slightly greater humidity seems to have a positive influence on stapeliad culture. After all, stapeliads tend to grow in the depths of bushes in their natural habitat. These sites are likely to have a more humid microclimate than in the open sites preferred by other succulents such as the euphorbias and most mesembs (see McDowell 1988).

By contrast with the majority of the asclepiads which are shade-lovers, Hoodia and, to a lesser extent, Trichocaulon as well as the lesser known Edithcolea, all need full light. This requirement makes it easier to retain the high aridarium temperature needed for success. These genera can be kept in the lightest and warmest part of the aridarium alongside the euphorbias (see McDowell 1988). The smooth-stemmed "cactiform" trichocaulons prefer slightly less exposure.
However, seedlings of the latter genera should be raised in the same conditions proposed for the other stapeliads. This is because they normally start life in the shadow of leafy plants, before eventually displacing these "nurse" plants.

Water
As with other succulents, each asclepiad species should receive water at the time of year corresponding with the rainy season of its natural habitat (see McDowell 1987b). Most types need to be given an occasional drenching during the warmer parts of the year, particularly during late spring/early summer and late summer/autumn periods (but do not water unless the soil appears dry). Stapeliads can be given a “mini-rest” from watering during the hottest month of the year. Misting of the plant with a fogger in the early morning or (preferably) the night before hot, dry days seems to favour healthy growth. In the case of species from the summer rainfall regions, plants should also be given an occasional misting during dry winter spells. For the minority of species of winter rainfall origin, accentuate water in spring and autumn rather than in winter (because of weaker evaporation).

Soil
Stapeliads prefer a quite rich soil that is very well drained. Drainage can be enhanced by preparing a mix that is light and sandy (see McDowell 1987b). The soil mix can be quite organic, with over a third by volume of finely sieved (1 mm mesh) leafmould content for shade-loving stapeliads, which experience a fairly “composted” soil beneath shrubs in nature. By contrast, it is safer to grow the extremely moisture-sensitive, light-loving species of Hoodia and Trichocaulon in a soil which is rich in minerals rather than organicas. This mixture is also considered safer by many of those collectors who grow exceptionally rot-prone genera such as Tovaresia, Tridensia and Quapua.

Andrew Russell, who has notable success in cultivating the more difficult stapeliads, adds a sizable proportion of decayed dassie (“rock rabbit”) manure to his basic stapeliad soil mix. [This rather exotic addition to the traditional stapeliad "menu" may be garnished from the “toilet mounds” around the middens of these rodent-like animals.]

Certain other growers may choose to use much less leafmould than suggested above as they believe it facilitates infestation of the pemicsious root mealy bug (described below). The nutrient requirements of stapeliads can be met by regular feeding with a low nitrogen hydroponic solution during their season of growth (see McDowell 1987b). Feeding becomes more important when a high sand component is included for improved drainage and aeration.

Containers and transplantation
Stapeliads need comparatively large containers to allow their fairly wide-ranging roots sufficient space. Containers should therefore be at least 12 cm in diameter and 10 cm deep. Wide containers are better than those that are deep. The reason for this is that many stapeliads, especially Huernia species, grow in....

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quite shallow soils in nature — often only about 5 cm deep (according to Russell). Those stapeliads which are exceptionally sensitive to conditions of poor soil drainage, namely rot-prone genera exemplified by *Hoodia* and *Trichocaulon*, are often cultivated in unglazed clay pots. Such containers dry out quicker than plastic pots because of their greater porosity. (Russell) maintains he achieves the same effect by drilling several small holes in the sides of plastic pots. A general precaution against rot in stapeliads is to ensure that the crown (root-shoot interface) is set within a layer of coarse, sterile grit, with only the roots making contact with the soil.

Most genera do best with regular replanting every year or every other year. The time for replanting should be the start of the growth season, namely early summer (November–December) for the bulk of species. Such regular replanting is only necessary for species with short-lived stems, especially at the stage when the whole plant starts to show decreased vigor. Most succulent stapeliads fall within the latter category: the exceptions being *Hoodia*, *Trichocaulon*, *Pseudodithis* (and a few other genera) which have persistent succulent stems, and *Brescystelma*, *Pochon*, *Raphionacme* as well as many *Cerastogyna* spp. (among others) which have long-lived succulent tubers.

To replant, substitute the old soil with fresh preparation. Carefully excise all ageing stems from the younger material by severing at the joints. The resultant offsets are then treated as cuttings by dusting the cut surfaces with sulphur powder before resting them for a few days out of direct light on an airy shelf to allow healing. To minimise the possibility of rot, the offset-cuttings can be planted in such a way that the susceptible cut surface remains above ground (like one tail of a "U"), with only the centre of the stem (= base of the "U") being buried. In many cases, cuttings will eventually root even if simply rested on the surface of the soil.

**Special problems**

The average asclepiad collection is prone to attack by rot-causing fungi and bacteria. Carefully slice off all decayed parts from infected stems with a sharp knife and treat healthy remnant even as one would offset-cuttings (described above).

a) *Mealy bug*

Apart from rot organisms, the most notorious pest of stapeliads is the mealy bug. Especially in larger collections sheltered by cover, little can be done to prevent the occasional incidence of these sap-sucking vampires — a similar situation to that described for red spider dependences (see McDowell 1988). Certain stages in the life of the mealy bug may be airborne or even transmitted by ants — the main culprit being the difficult-to-eliminate Argentine ant. If the latter is controlled diligently, this will solve much of the mealy bug problem. Several types of mealy bug confine their attention to the plant below the ground, in particular around the root-shoot interface. The infestation of the root mealy bug category may only be detected at an advanced stage. This is frequently associated with unexpectedly poor plant performance. With large stapeliad collections, carry out spot checks by uprooting any "suspicious" plants for inspection. Alternatively, as some collectors prefer, give spays once (or more) during the early growing season as a general preventive. Be careful, however, as asclepiads show intolerance of certain sprays, e.g. those containing Diazinon.

For problems with red spider, exactly the same principles apply as in the root mealy bug spraying programme (see McDowell 1988).

Spray preparations should be thoroughly watered in and around the growing plant at regular intervals. With localised infestations, these may be controlled by hand-painting the culprits in situ with methylated spirits, and/or by carefully removing all visible insects from around the roots or stem. The more diverse the variety of control measures used (of which many are available) the lower the chance of developing immune aphids. (See also McDowell (1991a) for detail on control of succulent pests.)

b) *Grafting as a preventive*

Most stapeliads are prone to the ravages of nannies attacking below ground. For successful cultivation, the solution lies in grafting young stems (across) of the delicate stem succulent types onto stem bases (stocks) of the few hardy species. I find *Orbea variegata* and *Stapelia hirsuta* very useful as root stocks. Other growers report success with tubers of the ever-popular *Cerastogyna woodii* ("chain-of-hearts") as root stocks. (For further details on propagation etc see McDowell (1991b) — in prep.).

**Conclusion**

Do not be heartily discouraged by the horticultural problems outlined. Instead, prospective stapeliad enthusiasts should see the successful cultivation of these charismatic, but fickle plants as a challenge. Once mastered, their cultivation will make the culture of other succulent groups appear easy by comparison. The collector who lacks such ambition can, however, rest assured that there will always be a small cross-section of the hardier stapeliads that will survive — even prosper — in a given local environment with minimal attention.

**Acknowledgements**

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**References**


Clive McDowell is a regular contributor to *Veld & Flora*, sharing with us his extensive knowledge of the horticulture of succulents, and his zeal for conservation of various threatened habitats — ranging from Cape renosterveld to the rare vegetation enclosed by the Kenilworth track. He is presently engaged in writing a book on the cultivation of southern African succulents, in conjunction with Struik Publishers.

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