VITACEAE
Grape family

Members of this family, including *Cyphostemma* and *Cissus*, grow from cuttings in the growing season, provided they have been allowed to dry out for about two weeks. Lay the climbing species in a bed of sand for the stems to take root. Take the cuttings at the beginning of the new rainy season.

Propagation from seed is easy and quick. Make sure that the desert species are able to rest during the dry, dormant period. This period is different in the different countries where these species may occur. Collect a minimum of five different plants to obtain a better genetic spread in the collection.

WARNING

Do not attempt to clean the seeds by chewing off the flesh, as the fruit of many of these species contain crystals that produce a very unpleasant reaction in the mouth and throat.

ZAMIACEAE
Cycad family

Encephalartos is best propagated from seed. Seed viability can be established by the flotation test—healthy, fertilised seed drop to the bottom—although I have had mixed results with this method of testing seed. Rather sow all the cleaned seed and keep monitoring until most have germinated. This could take up to 6 months. The seed must be kept warm and in the light for best results.

Another way of propagating the genus *Encephalartos* is with suckers, also called offsets or "pups". A classic

▲ **top** Encephalartos ferox *seedlings germinating;* **bottom** *Female cones of* Encephalartos *sp. with suckers growing from the central core of the cone. (Photo: Sharon Louw)*
◀ Cyphostemma flaviflorum *in seed.*

example is *Encephalartos woodii* where the only known plant is male. This species is propagated solely by removing and growing "pups"—it is reportedly extinct in the wild. It was endemic to the Ngoye Forest in KwaZulu-Natal, South Africa. Remove the "pups" when the new growths have a stem of about 100 mm in diameter. Set these in a sandy, compost-rich soil in semi-shade until new roots have developed. Rooting can take up to 6 months. Remove offsets at the beginning of the growing season. Some people remove the leaves of these offsets, but I always leave them on and the plants seem to develop just fine.

Ex situ propagation and cultivation are a concern because of the localised nature of some of the more rare species and the need to keep the wild population intact. Despite stringent laws, these plants attract collectors and we are still unable to protect these plants adequately.

Encephalartos are subtropical and will not survive in cool climates, unless they are grown in a glasshouse.

ZINGIBERACEAE
Ginger family

Siphonochilus aethiopicus is regarded as rare in South Africa and Swaziland. It was one of the first medicinal plants that I ever tried to propagate. It was also my first encounter with how tissue culture can bulk up your stocks rapidly and allow you the luxury afterwards of propagating many more plants by conventional methods. Dr Hannes de Lange and Prof. Kobus Eloff made the initial breakthrough, using cultivated ginger methods at Kirstenbosch. (De Lange, 1989; Crouch & Symmonds, 1998; Crouch *et al*., 2000; McCarten *et al*., 1999).

I was involved with the first effort of cloning *Siphonochilus aethiopicus* in the late 1980s when I sent material to Kirstenbosch. Hannes de Lange, researcher at Kirstenbosch, used the protocol that he developed for commercial ginger (*Zingiber officinale*) on our native ginger and it was successful. He was then able to produce many thousands of plants for us in the Durban Parks Department. We used the same recipe and continued to grow thousands of plants for ourselves. The plants we were producing of one or two clones were being grown and harvested for the traditional medicine trade. Growing clones was not a problem.

If our mission were to save this plant from extinction, however, we would have failed dismally, as we did not have a wide range of genetic material that would enable us to reintroduce the plant into the wild. These plants would not have been able to seed freely, lacking a whole range of pollen types to choose from. This would have led to pollen incompatibility problems.

ZYGOPHYLLACEAE
Caltrop family

As a grower living in the subtropical part of Africa, this is a family that I am not familiar with at all. Ernst van Jaarsveld at Kirstenbosch is very definite in his opinion that propagation is not possible. If advice is needed, I suggest that *Zygophyllum* seed is sown when the growing season starts and that habitat soil is mixed into the seedling mix as an inoculant to ensure the best possible chance at success.