

Last chance for *Gladiolus aureus*

The golden gladiolus
is still on the brink of
extinction



by **Graham Duncan and Liz Ashton**

ABOVE: *Gladiolus aureus* flowering in the Kirstenbosch bulb nursery. Photo: Graham Duncan.

Gladiolus aureus is a delicate, early spring-flowering irid 400-600 mm high with narrow greyish-green leaves clothed in short white hairs, and striking funnel-shaped blooms in shades of pale to deep golden-yellow. Endemic to fynbos on seasonally moist sandstone hillsides and flats of the southern Cape Peninsula, it has historically always been confined to a few sites in the Kommetjie and Simon's Town areas. Today it is known from just a single locality near Kommetjie where its almost complete demise was brought about in the late 1960s and early 1970s by the development of a township over most of its last known habitat. The subsequent combined effect of alien plant infestation, heavy recreational usage of the immediate area, casual flower-picking and habitat degradation due to gravel quarrying placed it on the brink of extinction, but surprisingly a fluctuating number of plants have managed to survive.

The largest number of flowering individuals ever recorded was sixty-one out of a total number of 113 plants noted in 1978, while by sharp contrast, in the spring of 1980 a mere two plants flowered. In 1975 and 1976, wild-collected seeds were brought into cultivation in the nurseries at Kirstenbosch and the Cape Department of Nature Conservation's Assegaaibosch station near Stellenbosch, respectively. The latter plants were later transferred to the Kirstenbosch nursery where a stock has since been maintained and propagated. In 1976, a further 1100 seeds collected by the Rare and Endangered Plant Species Survey

team, led by Prof. Tony Hall of the Botany Department, University of Cape Town, were temporarily stored under sub-zero conditions in the blood-plasma bank at the Cape Town Medical Centre, and later deposited in what is now the Millennium Seed Bank at Wakehurst Place in Sussex, England, as a measure of long-term conservation. Germination tests carried out there have proved successful, and in the most recent test sample carried out in 1995, a 100% germination rate was obtained.

In 1982, a concerted effort was made by Chris Burgers of the Cape Department of Nature Conservation to convince the Divisional Council to secure the last remaining wild plants from further habitat destruction by the erection of a high fence. Unfortunately the fence fell into disrepair, and by 1990 no sign of it remained. As the protection of the *Gladiolus aureus* site posed a major problem, an attempt was made in the mid 1980s to establish a new population, drawing on *ex situ* material from the Kirstenbosch nursery. A site was chosen in the Cape of Good Hope Nature Reserve and several hundred corms were planted out there but only survived a few years before all succumbed to the depredations of wild animals.

The *Gladiolus aureus* locality currently falls within the jurisdiction of the Table Mountain National Park. The plants occur in two sub-populations, an upper population situated on a ridge in relatively dry habitat, and a lower population occurring on a seasonally wet, gentle slope. The poorly



ABOVE: Water-colour painting of *Gladiolus aureus* by Vicki Thomas, painted from specimens cultivated in the Kirstenbosch bulb nursery. Painting reproduced by kind permission of the Environmental Education and Resources Unit of the University of the Western Cape.



ABOVE: Part of the single remaining habitat of *Gladiolus aureus*, the lower portion, photographed in September 2004. It was cleared of aliens by the Kommetjie Environmental Awareness Group. Yellow *Ursinia* flowers in the foreground.

BELOW: Ripe capsules containing the precious seeds of *Gladiolus aureus*, Kirstenbosch bulb nursery.

Photos: Graham Duncan.



drained, sandy soil is underlain by gravel and clay, and the plants have for decades been threatened by dense stands of Port Jackson (*Acacia saligna*), cluster pine (*Pinus pinaster*) and stone pine (*Pinus pinea*). Recently, the habitat of the lower sub-population has been cleared of all aliens due to the sterling work of Wally Peterson and a community-based project known as the Kommetjie Environmental Awareness Group, while the upper part, currently heavily infested with *Acacia saligna*, should be cleared in the near future. During a visit with horticultural colleagues from Kirstenbosch to the latter site in August 2004, not a single specimen could be located despite a thorough search, but once the aliens have been removed they will hopefully re-appear. On a later visit to the lower site with Hennie Delpert of Silvermine Nature Reserve, only seven mature plants were found, of which just three individuals had flowered, and no seed capsules had formed. The flowers are pollinated by honeybees and up until the early 1980s, they regularly produced seeds although the unripe capsules were often heavily predated by buck and insects.

Cultivation and propagation

During the early 1980s, surplus seeds of *G. aureus* harvested from the Kirstenbosch nursery were distributed to specialist bulb growers in South Africa and abroad. Seeds have also been made available for general distribution to Botanical Society members on several occasions, but the number of plants being privately cultivated at present remains very low.

Maintaining *G. aureus* as a container plant over an extended period is easily achieved provided a few simple requirements are met. It needs an acid, sharply drained sandy growing medium (such as equal parts of coarse river-sand and silica-sand with a thick layer of finely milled bark or compost placed at the bottom of the container), bright light for as much of the day as possible, or alternatively full morning sun and afternoon shade, regular watering from mid-autumn to

late spring, and an entirely dry summer rest period. The plants are frost tender, require good ventilation during the winter growing period, and should be kept constantly moist just before, during, and just after the flowering period. Isolation of the plants just prior to flowering, and hand pollination of flowers are essential in order to obtain pure seed as this species hybridizes readily with other members of this genus.

Although cormlets occur around the base of the corm, these often remain dormant for extended periods and the fastest method of propagation is by means of fresh seeds sown in deep containers or seed-beds in late autumn, once temperatures have cooled down markedly. The seeds germinate within four to five weeks and under ideal conditions, will flower for the first time during their third spring season. The life span of mature corms under cultivation in the Kirstenbosch nursery is generally six to seven years, but have in some instances exceeded ten years, but being such a critically endangered species, it is advisable to obtain pure seed every year and have batches of young plants of differing ages coming on, in case of sudden disaster.

As a further measure of insurance,

propagative material should not be confined to a single container that may easily fall prey to insect or fungal disease with a high likelihood of loss of all corms, but be grown in several containers, placed in different parts of the growing area.

What of the future?

The number of mature individuals of *Gladiolus aureus* remaining in the wild today has reached dangerously low levels (optimistically estimated at about thirty) and almost certainly no longer constitute a viable population.

However, if every practical step to safeguard the locality is taken, and the programme of alien plant removal is

sustained, the possibility exists that *ex situ* material could be re-introduced to the original site.

In addition, efforts will be made to identify alternative safe locations well away from this site, where further attempts will be made to establish new populations. While survival may be artificially aided by seed storage in gene banks, and by cultivation in botanic gardens and by private individuals, it is imperative that if at all possible, the wild habitat serves as the primary safe home of the species. *Gladiolus aureus* forms part of the South African National Biodiversity Institute's Threatened Species Programme.

Further reading

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BELOW: The upper portion of the last remaining *Gladiolus aureus* habitat in August 1993, surrounded by alien *Acacia saligna* and *Pinus pinea*. Photo: Graham Duncan.

