



Cyrtanthus galpinii flowering in recently burned rocky grassland. Plants flower from mid-July to mid-August, the leaves only starting to emerge when the first rains fall in October. The plants are about 15 cm high. Photo: Connall Oosterbrook.

Cyrtanthus galpinii

Will changing land-use patterns affect the populations of the dainty fire lily, *Cyrtanthus galpinii* in Mpumalanga?

by Charles Craib

Nearly all bulbs from the summer rainfall area are fully dormant in the winter when the grass is dry and susceptible to burning. *Cyrtanthus galpinii* is an exception to this rule, flowering at the end of the winter drought when the grasslands are at their driest.

The habitat in which *Cyrtanthus galpinii* grows east of Piet Retief in Mpumalanga consists of hilly country with numerous valleys and cliff-lined gorges above a perennial river. They occur mostly in rocky, lightly wooded grassland on the summits of the taller hills. Human settlements in the area are mostly in flatter grassland some distance away from the river and its associated hilly and rocky grassland. Some twenty years ago the site where the plants were studied was part of a large cattle ranch but recently it was returned to its original owners and now sheep and goats, herded by the local people, have replaced the cattle herds. The *Cyrtanthus* habitat has never been heavily grazed since the rocky areas are only sparsely covered with grass. The grass cover seldom becomes very long unless there are long periods between winter grass fires.

The flowering time has been remarkably consistent over two decades. The plants flower from mid-July to mid-August, with the same peak flowering period in the last week in July and the first week in August. At this stage the bulbs are in a leafless state, the leaves only starting to emerge when the first rains fall in October.

The bulbs grow in a number of widely scattered colonies and are most abundant just below the crests of hills facing south-east and south-west. Some bulbs grow in north- and west-facing positions on the rocky grassy banks of the main perennial river, quite close to the flood line. These plants receive heavy morning dew, which allows them to grow in such sunny positions. Also, in summertime these situations are usually at the edges of seepage areas that originate in damp depressions higher up the hill slopes.

The burning of grassland plays a crucial role in maintaining populations of bulbs and many succulents in the summer rainfall central and eastern interior of South

Africa. In most instances fires occur in the winter and spring from May to September or October, at about the time the first rains fall. Burning is beneficial to the bulbs of many species as it re-distributes nutrients and clears the habitat of moribund grasses that block out sunlight.

Nearly all bulbs from the summer rainfall area are fully dormant in the winter when the grass is dry and susceptible to burning.

Cyrtanthus galpinii is an exception to this rule, flowering at the end of the winter drought when the grasslands are at their driest. If burning occurs at flowering or seeding time an entire season's flowers and seeds are lost. If fires occur in the period from early May to early July, conditions are greatly improved for the flowering performance of this species. Mass flowering usually follows early winter burning. During a visit to the site in late July 2003 I noticed that a large section of the veld had been burnt but much of the habitat had escaped the fire - the deeply incised gorges between hillsides preventing the flames from spreading. Plants in the burnt areas flowered very well, particularly where the grass cover had been dense. In some areas where the grass cover was thick and had not been reached by fire, the plants failed to flower at all. In other situations that had escaped burning and where the grass cover was sparse, most of the mature bulbs were in flower.

Some flowering of this species takes

place every year and is best when the grass cover is not dense. In years when fires occur in early winter, flowering is normally at its optimum.

Seeds are liberated into the environment in the first half of October, usually at the beginning of the month. This is just before the main summer rains begin. *Cyrtanthus* seeds germinate readily once the first summer rains begin, especially in burnt grassland where the grass cover is short. These conditions occur infrequently, as most plants grow in rocky areas with short grass. Bulbs in short but dense grass cover are likely to have become established as seedlings after early winter grass fires.

The modern environment

There have been some changes to the habitat since studying *Cyrtanthus galpinii* here about two decades ago.

The grazing pressures have increased and in places the open woodland has been cut down for firewood. Felling of woodland could result in changes to the composition and abundance of grasses. So far the felling of trees has not been accompanied by much soil disturbance. Should this occur, a greater number of weeds will probably invade the grassland where *C. galpinii* grows.

There have been no changes to the populations of *C. galpinii* on the rocky hillsides where the majority of plants are found. The shorter grass, regularly grazed by animals, may even benefit the species in future. The plants in grassland near seepage areas are trampled by grazing stock but these areas are marginal habitat for the plants and this is unlikely to affect populations as a whole.



ABOVE: The dainty flowers of *Cyrtanthus galpinii* are about 4 cm wide. BELOW: Typical lightly wooded hilly and rocky grassland, the habitat of *Cyrtanthus galpinii*. Photos: Connall Oosterbrook.

