Fire-lilies, the Firebirds of the Fynbos

A small group of bulbous plants flower immediately after fire, set seed, and may not flower again for 20 years. In this article, the survival strategies of one such species, Cyrtanthus ventricosus, are examined.

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Fire as a friend
Like the firebird, fynbos is born of fire and can be maintained as one of the richest plant treasures in the world only through the continued influence of fire. The many plant species found in the fynbos have evolved various ways to cope with fire. Some have developed a strategy of retaining their seeds on the plant, in the protective dry out flower heads, until after a fire, when the seed is released to germinate on the open ground. Others rely on ants to transport their seed to subterranean chambers to lie safe from predators and the heat of the passing fire. Other plants have evolved a large underground storage organ in the form of a woody rootstock or a bulb or tuber which resprouts after the passage of a fire.

cultivation and in the wild, and also reproduce prolifically by means of offsets or bulbils. However, it is notoriously difficult to get Cyrtanthus ventricosus to flower in cultivation and it does not produce a significant number of bulbils.

We decided to monitor the response of a small population of this species in the Jonkershoek valley near Stellenbosch after a fire in 1987. We found and marked 100 plants and visited them regularly over a period of six months to note the phases of growth. The first buds appeared about 12 days after the fire and within seven weeks the last flowers had died back. Twelve weeks after the fire, the first seeds were shed and three weeks later seed release was completed. Each plant produces an average of two mature capsules and, at approximately 27 seeds per capsule, has the potential to produce 54 seedlings.

Some seeds, collected to determine seed production, were used in a small germination trial in a growth chamber. The germination percentage was very low under these conditions but a high germination percentage can be obtained by keeping the seeds in water until germination begins. Some seeds, left over from the germination test, were put into a jar of water nearly two years after they were collected, and after one month in the water they began to germinate. These results, unfortunately, do not represent the situation in nature.

To see whether the flowers were self-pollinating, we placed a small muslin bag over some flower heads to exclude insects and birds. Not one of these flowers set seed. During the entire period over which we observed the plants, the only pollinator we saw was the beautiful Mountain Pride butterfly, Aeropetes (Meneris) tulbaghia.

Many unanswered questions
After studying the plant in the field we were left with some puzzling questions. Here we have a plant that produces few bulbils, and seed only once every 10-20 years. Each plant bears an average of five flowers yet the pollination success is so low that only two capsules per plant reach maturity and shed seed. Could this be because only one pollinator is involved? Why does the plant restrict itself to flowering only after a fire? It is obvious that we need to answer these and other questions about this beautiful plant before we can understand its complex biology.

So when next you take a walk in the mountains and you pass through a blackened stretch of recently burnt veld, keep an eye open for the beautiful fire-lilies and remember: in the right place, at the right time, fire is the driving force responsible for the continued well-being of the threatened fynbos kingdom.

Further reading