

# Kraalaalwyn:

## an oasis in the drought



The Kraalaalwyn (*A. claviflora*) flowers in spring throughout central arid South Africa. Photo by Sue Milton.

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It is no wonder that artworks of South African landscapes often feature a tall, candelabra-like aloe in the foreground of the canvas. These iconic African plants, which flower in profusion along the lower slopes of many of South Africa's escarpments during winter, are the 'must-have' succulents of indigenous water-wise gardens.

Aloes as a group – which, for the purposes of this article includes recently revised genera such as *Aloidendron* and *Gonialoe* – are found almost throughout southern Africa. The group is diverse (~155 taxa in South Africa alone) and some species straddle a relatively broad range of climates and habitats. Their resilience and drought-hardiness rely on an array of strategies such as low palatability, succulence, large roots, vegetative propagation, brightly attractive flowers, and winged seeds designed for wind dispersal.

A number of photographic- and creative artworks, studies, articles and anecdotes have documented the plethora of visitors to aloe flowers. The brightly coloured pink, yellow, or orange-red flowers attract a suite of specialist- (i.e. sunbirds) and generalist birds. Supporting evidence shows that bird visitors are further determined by the variation in nectar type found between different species of Aloe. Thus, sunbirds are more likely to visit flowers that produce smaller quantities of sweeter, more

concentrated nectar to meet their energetic demands, while generalist birds like bulbuls or white-eyes will more often go for the flowers that produce larger volumes of more diluted, less sweet nectar to supplement their omnivorous diets. There is a much larger suite of insects, such as honey bees and bee flies, which utilise Aloe nectar.

Recent evidence has also shown that birds and insects are not the only animals to enjoy the delectable nectar produced by aloes. Elephant shrews (also known as sengis) and rock rats frequently feed on the nectar of the Critically Endangered Magaliesberg Aloe (*Aloe peglerae*) during the winter flowering season on the ridges of the Magaliesberg mountains (see the June 2017 *Veld & Flora*). Small-mammal nectar-feeding is not, however, an entirely uncommon phenomenon and has been documented, for example, in species of the family Cytinaceae (root parasites with flowers at ground level) and Hyacinthaceae (see the June 2015 *Veld & Flora*), as well as in some low-growing species in the Proteaceae.

## AN ALOE OF THE ARID KAROO

Several aloes – such as the Bitter Aloe (*Aloe ferox*), Quiver Tree (*Aloidendron dichotomum*), Maiden's Quiver Tree (*Aloidendron ramosissimum*) and the Kanniedood or Variegated Aloe (*Gonialoe variegata*) – inhabit the dry plains of the Karoo and are true arid-adapters. They also epitomise the adage that flowering aloes are "islands of reward" for foraging animals.

The Kraalaalwyn (*Aloe claviflora*) has an extensive distribution, from north of the Suurberg in the Eastern Cape, into the Free State past the Gariep River, westwards to Prince Albert in the Western Cape, and up through the Northern Cape towards Warmbad in Namibia. An ancient and long-lived species, the Kraalaalwyn has adapted to survive in the dry central region of South Africa, and is rather difficult to cultivate outside of its arid habitat.



Male and female Cape Sparrows drink nectar from the Kraalaalwyn. Photo by Gina Arena.



The Round-eared Elephant Shrew uses its long snout to probe the flowers at night. Photographed on the Wolwekraal Nature Reserve in Prince Albert, Western Cape. Photo by Gina Arena.

This is one of the more unusual species within the genus because of its unique growth habit. The small, winged seed – once dispersed by the wind to an ideal habitat under the shade of a shrub – germinates and grows into a single, stemless rosette (leaves arranged in a spiral). After an unknown period, this plant multiplies its stems, which extend horizontally until several new rosettes (an average of seven) have grown into a crescent- to circular shape. At the start of spring, the rosettes produce densely flowered, bright orange-red racemes (a stalk of clustered flowers), which grow horizontally, almost prostrate, a few centimetres above the ground.

This species is aptly named the Kraalaalwyn, since *kraal* is Afrikaans for an enclosure or livestock pen, but it is also known as the Kanonaalwyn, (Afrikaans for canon aloe), since its racemes resemble canons pointed outwards from a *laager* (Afrikaans for a circular camp). One might imagine these astonishing rings of fire to be an alluring

attraction to any nectar-seeking bird flying above the Karoo plains.

On that note, it is not surprising to find resident Karoo birds, such as the Cape Sparrow or Malachite Sunbird, drinking the nectar of the Kraalaalwyn. Honeybees and bee flies are also immensely attracted to its nectar, and Karoo farms often keep their bee hives close to dense patches of the Kraalaalwyn. Crawling insects, such as the Tawny Balbyter Ant (*Camponotus fulvopilosus*), have also been observed visiting the flowers in search of moisture. Due to the easily accessible, low-lying racemes, one might wonder whether other animals exploit this nectar resource. To investigate this question, movement-sensitive camera traps have been used in a dense population of the Kraalaalwyn on the Wolwekraal Nature Reserve, just 2 km north of Prince Albert, a small Karoo town. Cameras set for 24-hr periods during the flowering season in 2016 revealed that the Round-eared Elephant Shrew (*Macroscelides proboscideus*) visits these flowers at night.

## NECTAR-FEEDING BY THE ROUND-EARED ELEPHANT SHREW

Round-eared Elephant Shrews observed on the Wolwekraal Nature Reserve appear to inhabit the abandoned burrows of Whistling Rats. Generally, elephant shrews don't seem to adhere strictly to either diurnal or nocturnal activity, and on several occasions individuals of this species were seen to be active during the day. When a human approached a colony of burrows, one elephant shrew would retreat immediately, while another would stand guard at – and sometimes dash between – the entrances of one or two neighbouring burrows, itself rarely retreating into any burrow even when threatened by human proximity. This behaviour might be what is known as 'male mate guarding', a tactic used by males to guard their mate from other males. Burrows that are within close range to aloe *kraals* are suspected to be ideal nesting sites for elephant shrews for reasons related to predation risk and energy efficiency,

however, this association between burrow location and proximity to flowering aloes is yet to be tested.

Apart from one study which examined the diets of the Round-eared Elephant Shrew, there is little else we understand about this species. The contribution of insects to their diet tends to vary considerably between individuals and regions, with an almost equal contribution from vegetation, seeds and fruit. This affinity to herbivory may be of great benefit to animals that inhabit arid environments, where insect availability is dependent upon seasonal extremes. Such a theory at least appears to be the case for the Round-eared Elephant Shrew. Research has shown that this animal can – physiologically-speaking – handle the intake of vegetation year-round due to the possession of an elongated large intestine (a caecum which helps to break down the fibre ingested from plant matter) which is rarely present in other insect-feeding shrew species. The importance of nectar to the elephant shrew diet and energy efficiency is unknown but is expected to be relatively small, or at least limited, to this short window of flowering in the Kraalaalwyn.

## PORCUPINE HERBIVORY DURING DROUGHT

The Kraalaalwyn might benefit from the pollination services offered by birds, insects and elephant shrews, but when an unforgiving drought does not cease, aloes become susceptible to being damaged by other animals. The leaves of aloes hold a significant volume of water in their tissues, but are notoriously bitter-tasting and unpalatable to herbivores. However, there are other edible parts of the plant. Evidence of plant damage by Cape Porcupine has been recorded on the Kraalaalwyn in the Wolwekraal Nature Reserve during the recent drought (i.e. since 2015). The porcupines destroyed a group of aloes by biting off the stems at ground level to eat the stems from the root base end up to the bases of the smallest leaves. This effectively destroyed each rosette leaving behind a pile of unpalatable leaves. Herbivory of this nature, to our knowledge, has not been recorded before, except one sighting in 2009 at Silvermere in Burghersdorp in the Eastern Cape, where extensive

damage to Mountain Aloe (*Aloe broomii*) plants by porcupine were reported on their website.

While this seems to occur only rarely, such opportunistic feeding behaviour by porcupines can be detrimental to the survival of an aloe *kraal*. As drought conditions are predicted to continue, or become more frequent in the future, many questions are raised around the susceptibility of smaller populations of aloes to this destructive feeding behaviour by animals.

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