



4.2 Aloe excelsa

Latin:	<i>Aloe excelsa</i>
Family:	Liliaceae
English:	Zimbabwe tree aloe
Shona:	Chikohwa, Gavakava
Ndebele:	Imangani
Regions in Zimbabwe:	Zambezi, Kalahari, Central, Save Limpopo, Eastern Highlands

Botanical Description

Aloe excelsa, commonly known as the ‘Zimbabwe tree aloe’, was named for its lavish growth amongst the ruins of Great Zimbabwe. It is found in warmer areas, amongst wooded grasslands and frequently on rocky outcrops or hillsides. It normally grows to a height between 3 and 6 metres, with a single central stem crowned with a large and succulent rosette at the top. The lowest part of the stem is typically swathed in the remains of dead leaves. Leaves are dark green, large, spreading and succulent, while the lower ones are conspicuously drooping. The leaves are often rosette with spiny toothed, reddish brown margins. Prickles are usually present on the lower leaf surface near the apex. These disappear as the plant grows and becomes less susceptible to browsing.

This species can be easily confused with *Aloe ferox* or *Aloe africana*, especially when they are fully grown. The flowers are distinguished by the fact that the racemes of *A. excelsa* are shorter and slightly curved. The flower heads are branched; each spike is densely flowered, orange to dark red in colour. The flowers are usually nodding, with a bright glossy red to orange-yellow perianth. The flowers develop from July to December and are a striking feature of the Zimbabwean landscape at this time. *A. excelsa* thrives in a variety of grasslands and woodlands mostly on rocky outcrops or hillsides. In Zimbabwe it is found across all ecological regions, predominantly in areas with rocky outcrops or on hillsides, and is one of 30 different aloe species in the country. *Aloe excelsa* is also found in several neighbouring countries.

Traditional Uses

The *Aloe excelsa* is known as “*inhlaba*” to traditional healers in Zimbabwe, who use several succulent plants together with other indigenous trees and plants in their medicines. They also believe there are male and female aloes, male plants having more spines on their leaves than female plants. The leaves,

which are known to cure several ailments, are collected from the wild by traditional healers, dried and boiled to extract a decoction which then has a number of medicinal uses. These include being taken as an oral infusion for the treatment of abdominal pains, jaundice or to remedy a depressed fontanelle in infants. As a cure for asthma, the leaves are burned, mixed with salt and taken by mouth. The leaves are also used as an infusion in fowls’ drinking water to cure fowl-pox.

A. excelsa has also been extensively used as a traditional remedy for topical skin conditions. The lectin content of *A. excelsa* is higher than in other aloe species. These lectins are responsible for the coagulating properties that make it an effective treatment for burns, cuts, scrapes and lacerations.

Other medicinal uses include as a cure for sexually transmitted diseases, spasms, ulcers and as a laxative (which use is common in other countries where this aloe is found). Finally, another traditional use by cattle herders is to suck the sweet nectar of the inflorescence for energy.



Commercial History

There are over 500 Aloe species worldwide, many of which are commercially traded either as live plants for the ornamental plant industry or as extracts for the cosmetic and medicinal plant industry. Of these the best-known is *Aloe vera*, whose annual market value is reportedly in excess of US\$ 600 Million/yr in 2019 (IMARC., 2019). Closer to home, *Aloe ferox*, commonly known as the Cape Aloe, has a very long history of commercial use for pharmaceutical and cosmetic purposes, and is today one of South Africa's most heavily wild-harvested and commercially traded indigenous plants. The main commercial products of *A. ferox* are the leaf sap, used to make Aloe bitters, and the leaf gel used in skin care.

A. excelsa has not been widely used commercially, although it has found itself into some cosmetic formulations. In the 1990s in Zimbabwe, a local skincare brand produced a proprietary formulation blending *Kigelia africana* and *Aloe excelsa* extracts to combat sun damage to the skin (based on research by Maisiri and Gundidza 1999). However, much of its trade has been as an ornamental plant.

There are also significant (but unquantified) volumes of *A. excelsa* used by traditional healers and traded in medicinal plant markets.

Potential Commercial Uses

There are several different potential commercial uses for *Aloe excelsa*. Some of these are derived from the fact that *A. excelsa* exhibits traits similar to those found in other Aloe species. Others are more specific to the unique combination of compounds found in this plant.

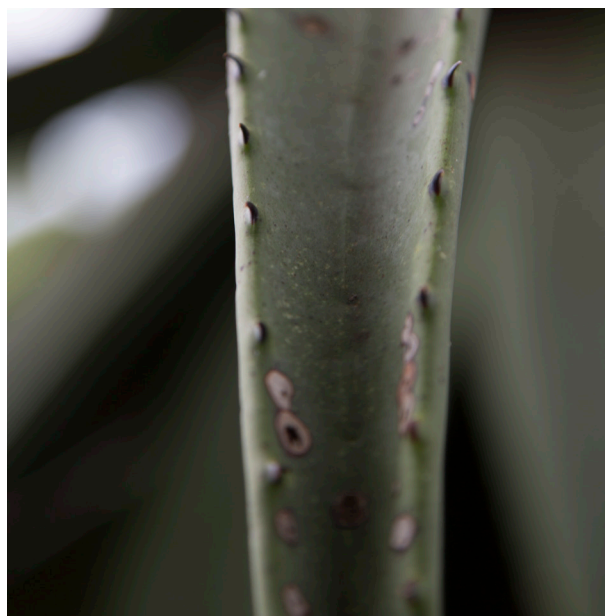
Perhaps the first and most obvious potential commercial use is as a dermatological product. *A. excelsa* has potent antibacterial and antifungal activity (Coopoosamy and Magwa., 2007). This suggests efficacy in both wound-healing formulations and skincare. At the same time, the soothing effects of Aloe gel make it a desirable and effective ingredient in burn ointments, sunburn treatment and UV sun-protection formulations.

A second potential use, for which scientific validation already exists, is in the management and treatment of Type 2 Diabetes. Two phytochemicals isolated from the leaf extract have been shown to have potent antidiabetic activity (Coopoosamy and Magwa., 2006), and a leaf extract showed significant

activity on reducing blood glucose levels in diabetic rats (Gundidza et al, 2005). This tallies with research work that is being done on a broader level on the use of Aloe extracts to help diabetic patients (Singh et al 2020).

A third potential use is in veterinary medicine as an anticoccidial. Coccidiosis is a common parasitic disease affecting poultry. Leaf sap of *A. excelsa* has been found to be effective in the treatment and prevention of coccidiosis, making it a potentially desirable and low-cost treatment suitable for poultry farmers (Gadzirai et al., 2005).

A fourth potentially important commercial use for *A. excelsa* is as an ornamental plant. There is significant interest from global collectors and gardeners in different succulent plants, as long as the complexities of international trade in a CITES Appendix II listed plant can be managed.



Market Potential

The burgeoning global market for natural-ingredient based products has created robust demand for Aloe based products, especially from *A. vera* and *A. ferox*. This creates multiple opportunities for *A. excelsa*, which has notable and proven similarities to *A. ferox*.

Domestic consumers in Zimbabwe already purchase a wide range of products incorporating *A. vera* and *A. ferox*. These include personal care and toiletry products (Aloe gel, lotions, toothpaste, soap, shampoo, hair moisturiser), sun care products (sunscreen, after sun), skincare (moisturising and anti-ageing formulations) and wound healing/burn

treatment ointments. Although most of these products are imported (including a substantial volume of products from a British multi-level marketing company), many could readily be produced locally with consequent cost-savings and reduced requirements for scarce foreign currency.

Another area of considerable local interest would be as an antidiabetic ingredient in food and beverage products. There are already several products produced and sold locally that incorporate *A. vera*, including a yoghurt, an ice cream and various beverages. Substituting the *A. vera* with *A. excelsa* would be easy to do, and the growing numbers of Zimbabweans with Type 2 diabetes represent a significant market opportunity.

From an export point of view, it would take considerable effort to convince consumers and manufacturers that *A. excelsa* would be superior to either *A. vera* or *A. ferox*, both of which would undoubtedly be cheaper. However, there are compounds found in the Zimbabwean aloe that are unique, and further research could identify potential market niches that specifically apply to *A. excelsa*.

The USD 30 billion/yr export ornamental horticulture market is also worth further investigation. South Africa is the main supplier internationally of Aloes into the global market for horticultural trade, and there is no reason Zimbabwe should not also join this trade.

Cultivation/ Domestication Potential

All Aloe species are protected by the Convention on International Trade in Endangered Species (CITES), except for *A. vera* which is widely cultivated. It is therefore necessary to consider sustainable harvesting and commercial cultivation of the species.

A. excelsa can be successfully propagated. It prefers dry, tropical climates, open areas and full sun, in well-drained sandy loamy soils, with pH ranging from 7.0 to 8.5. Aloes in general require little or no soil preparation before planting. *A. excelsa* can be propagated from seed or vegetatively from the sideshoots that emerge close to the ground or from head cuttings. Plants are sown at 1 metre intervals. It takes about 4-5 years for the plants to reach the first harvest from the seed stage. At the time of harvest, each leaf weighs about 1.5-2

kg. Moderate water is required (once or twice a week), too much or too little will compromise the number and weight of leaves. Compost based manure is most effective to apply at a rate of 30-60t/ha and this could be split throughout the season. The older and outer leaves are harvested first leaving the younger leaves to grow. Aloe species are also effective agents for degraded rangeland treatment because of their mate-like root systems, which enhance soil binding.

