

Indigenous South African Medicinal Plants

Part 7: *Aloe ferox* (Cape aloes)

Alvaro Viljoen (PhD), Department of Pharmaceutical Sciences, Tshwane University of Technology

Botany:

The genus *Aloe* is represented by over 500 species with centres of diversity in Madagascar and South Africa. Based on their several uses and consumer products *Aloe vera* and *A. ferox* are considered to be the two most commercially important species. *Aloe ferox* is indigenous to South Africa and the natural distribution extends from near Swellendam in the south from where it extends northwards along the eastern coast of South Africa through the Eastern Cape to the southern parts of KwaZulu-Natal. *Aloe ferox* is single stemmed reaching 2-5 m in height.^{1,2} The large succulent leaves bear thorns on the margin although thorns may occasionally occur on both the upper and lower leaf surfaces. The flowers are usually bright orange which are compactly arranged on 5-12 racemes. *Aloe ferox* is closely related to *Aloe candelabrum* and many consider *A. candelabrum* to be a geographical variant of *Aloe ferox*.

Traditional uses:

For centuries the leaf exudate has been used to treat constipation.³ Leaves are harvested and the exudate is collected usually by arranging the leaves concentrically around a depression in the soil which is covered with a plastic sheet. The water is evaporated through boiling to yield a dark brown substance referred to as 'aloe lump' or 'aloe bitters'. More recently the cosmetic industry has started including the leaf gel in cosmetic formulations which is claimed to have healing and moisturising properties. Aloesin, a constituent of the leaf exudate also shows promise as a pigmentation-altering agent for cosmetic or therapeutic applications.

Scientific studies:

The laxative effect of anthrone glycosides (e.g. aloin in *Aloe* and sennosides in *Senna*) are well documented.⁴ The sugar moiety is removed by glycosidase to yield the active substance aloe-emodin anthrone. The Na⁺ / K⁺ and chloride ion channels are effected which increases the motility of the large intestine. A recent study summarised the composition of

the leaf gel and confirmed the presence of several antioxidant polyphenols.⁵ The authors speculate that the phytochemical composition of *Aloe* gel (high levels of polyphenols, phytosterols and indoles) may show promise to alleviate symptoms associated with cardiovascular diseases, neurodegeneration and diabetes. It has been demonstrated (*in vitro*) that aloesin, one of the major chromones present in the leaf exudate modulates melanogenesis via competitive inhibition of tyrosinase.⁶ It has also recently been shown that dietary supplementation with *Aloe ferox* extracts reverses obesity in rats.⁷

Side effects:

Due to the abortifacient, irritant and cathartic effects associated with excessive use of *Aloe ferox* it should be avoided during pregnancy and lactation.⁴ □

References:

1. Reynolds, G.W. 1950. *The Aloes of South Africa*. The Aloes of South Africa Book Fund, South Africa.
2. Van Wyk, B-E., & Smith, G. 1996. *Guide to the Aloes of South Africa*. 1st edition. Briza Publications, Pretoria, South Africa.
3. Watt, J.M., & Breyer-Brandwijk, B.N. 1962. *Medicinal and Poisonous Plants of Southern and Eastern Africa*. 2nd edition. Livingstone, Edinburg, UK.
4. Barnes, J. et al., 2007. *Herbal Medicines*. 3rd edition. Pharmaceutical Press, UK.
5. Loots, D.T. et al., 2007. *Aloe ferox* leaf gel phytochemical content, antioxidant capacity, and possible health benefits. *J Agric Food Chem* (55): 6891-6896.
6. Hughes, J.K. et al., 2002. Modulation of melanogenesis by aloesin: a competitive inhibitor of tyrosinase. *Pigm Cell Res* (15): 335-340.
7. Sibuyi, N.R.S. et al., 2007. Dietary supplementation with *Aloe ferox* extracts reverses obesity in rats. *S Afr J Bot* (73): 336.



Geographical distribution (orange) of *Aloe ferox*



Aloe ferox in flower



The traditional method used to collect the leaf exudate (bitters)



Aloe tappers sustainably harvest the leaves of mature plants



Aloe ferox leaves are 'filleted' for use in cosmetic formulations