TOXIC SOILS AND ALOE COLOURS

by ***Elize Cloete*** *and* ***Emile Plumstead***

Spectacular variations of *Aloe ferox* occur from the north-eastern part of its range, which stretches from Swellendam to southern KwaZulu-Natal, the Free State and Lesotho. Although there is variation in spinyness, leaf colour and size, none are quite as eye-catching as the flower colour. In the majority of populations the flowers are golden-orange to bright scarlet with orange-red being the most common. As one travels during winter it quickly becomes apparent that other colour variations are sparsely scattered in most of the areas north of Grahamstown. The populations from which these photographs were taken have a predominance of pale colours.

These populations occur in hot, dry river valleys and seem to be confined to soils associated with gabbroic intrusions. These soils are known to be rich in nickel, copper and other heavy metals, which when present in high concentrations create toxic soils that have various effects on plants. The effects can range from changes in colour or size to changes in morphology. Depending on the degree of change, new species may be recognized but in this case, it seems to be only an interesting colour variation. Colours vary from almost pure white to greenish-white, and from pale biscuit to lemon yellow. Others are deep pink to scarlet and orange. Anther colours seem more stable and their brownish-orange colour contrast beautifully with the paler petals. Aloes are bird pollinated and it seems reasonable to suggest that the change in flower colour originated in the toxic soils and were slowly spread by birds from those population to others.

The late Mr D. Hardy, co-author of *Aloes of the South African veld*, had the following to say about aloes and toxic soils: *'Aloe thorncroftii* occurs only on serpentines near Barberton while *A. peglerae* appears to favour soils where zinc, tin and chrome are known to occur. *Aloe orthlopha* in Zimbabwe also favours the serpentines, while *A. peglerae* occurs on Magaliesberg quartzite. In Madagascar I am looking at species such as *Aloe laeta* which also appears to have specific requirements as far as macro elements are concerned.'

Researchers need to find answers to the following questions about the populations:

- are changes in colour permanent?
- have the genes for paler colours been spread from population to population along the east coast?
- are there discrete flower colours?
- how many genes code for colour?
- is the epicentre of non-red colours on the gabbroic intrusions?
- do populations show a decrease in the proportion of paler flowers as one moves away from the toxic soils?

Do toxic soils cause this interesting variation in *Aloe ferox*?
Photos: E. Plumstead.

Further reading

Bornman, H. & Hardy, D. (1971). *Aloes of the South African veld.* Voortrekkerpers, Johannesburg.

Jeppe B. (1969). *South African aloes.* Purnell, Cape Town.

Reynolds, G.W. (1969). *The aloes of South Africa.* Balkema, Cape Town.

Van Wyk, B-E. & Smith, G. (1996). *Guide to the aloes of South Africa.* Briza, Pretoria.

Seeds of these pale *Aloe ferox* plants are **not** yet available from the National Botanical Institute at Kirstenbosch but if and when they are, BotSoc members will be notified. Normal *Aloe ferox* seeds are available however, and enquiries can be made about purchasing them from the Seed Section at tel (021) 762 1166 or fax (021) 797 6570.