

Aloe bakeri – a critically endangered highly localised Madagascan endemic

Colin C Walker

A review of the attractive small-growing *Aloe bakeri*, and notes on the South African botanical artist Cythna Letty. Illustrations as indicated.

Introduction

Aloe bakeri is an attractive dwarf Madagascan species that flowers freely and is readily propagated from cuttings. It has thus become relatively common in cultivation. This contrasts greatly with its situation in habitat where the species is on the brink of extinction, if not already extinct. A painting by Cythna Letty is included that showcases South African botanical art as published in the renowned publication *The Flowering Plants of Africa*.

History

Aloe bakeri Scott-Elliot was discovered and named in honour of John Gilbert Baker (1834–1920), the Kew *Aloe* specialist (Scott-Elliot, 1891). George Francis Scott-Elliot (1862–1934) was a British botanist, plant collector and traveller who visited Madagascar between 1888 and 1890 (Dorr, 1997). This *Aloe* was one of several novelties collected by Scott-Elliot chiefly at Fort Dauphin (also known as Taolagnaro, Tôlanaro or Tolagnaro) in the extreme south-east of



Fig. 1 *Aloe bakeri* (ISI 447/Rauh M1407) in a 10.5cm diameter pot (Photo: Colin Walker)



Fig. 2 *Aloe bakeri* flowering in cultivation
(Photo: Marjorie Thorburn)

Madagascar. Interestingly he recorded the habitat as “Sand-dunes, Fort Dauphin”. He gave the type as [Scott-Elliot]2937. It is of note that this type collection number has been incorrectly reproduced as 2957 by Reynolds (1966), Newton (2001) and Carter et al (2011).

Incidentally, Scott-Elliot (1891) also described just three other new succulents, one of which is no longer accepted as being distinct: *Kalanchoe verticillata* Scott-Elliot (= *K. delagoensis* Ecklon & Zeyher), *K. bracteata* Scott-Elliot and *Senecio antandroi* Scott-Elliot.

Perrier de la Bathie (1926), in the first monograph of Madagascan aloes (and lomatophyllums, which he maintained in a separate genus), placed *A. bakeri* in his Group I. This included 10 mostly large-growing shrubby species (four newly described) ranging from the large-growing *A. vaombe* to the small-growing *A. deltoideodonta* and *A. bakeri*. However he also

associated *A. bakeri* with his new species *A. sempervivoides* (now a synonym of *A. parvula*) which was separated in his Group II. These groupings are now seen as being rather artificial.

Aloe bakeri has been accepted as a good species by all subsequent investigators of Madagascan aloes: Reynolds (1955, 1958, 1966), Rauh (1964, 1995), Newton (2001), Castillon & Castillon (2010) and Carter et al (2011).

Roy Mottram helpfully noted that there is another *Aloe bakeri*, attributable to Hook.f. This however turns out to be a manuscript name that was never formally published (Baker, 1902) and hence has no nomenclatural standing. *Aloe bakeri* Hook.f. was given as a synonym for the Ethiopian species *Aloe oligospila* Baker, which itself is now considered to be a synonym of *Aloe percrassa* Todaro (Newton, 2001).

The only taxonomic change relating to this species was its transfer to *Guillauminia* as *G. bakeri* (Scott-Elliot) P V Heath. The genus *Guillauminia* was established by Bertrand (1956) for the single species *G. albiflora*. However until Heath (1994) expanded this monotypic genus to include half a dozen dwarf Madagascan species, this segregate from *Aloe* has generally been ignored. In particular it was not adopted by Reynolds (1966) in his monograph of the tropical and Madagascan aloes. Today there is no supporting evidence for the acceptance of *Guillauminia* as a distinct genus since its type species, *G. albiflora*, is firmly nested within *Aloe* in the most recent evolutionary tree of the genus based on molecular data (Grace et al, 2015).

***Aloe bakeri* in habitat and its conservation status**

Following Scott-Elliot (1891) and Perrier de la Bathie (1926), Gilbert Reynolds was the next significant

student of *Aloe* in Madagascar. He spent seven weeks and drove over 4,000 miles (6,437km) in search of Madagascan aloes in June to October 1955 (Dorr, 1997). Reynolds (1955) wrote, "Near Fort Dauphin I had the good fortune to find large numbers of a charming little *Aloe*, *A. bakeri* that had been described as far back as 1890. It has strikingly lovely flowers that are apricot-scarlet at base, shading through orange to yellow at the mouth, and with greenish tips. They are small plants, growing in tightly packed groups of fifty to a hundred." He collected Reynolds 7806 "On a rocky whaleback low hill, 8km west of Fort Dauphin on road to Vinanibe.... c. 40m, flowering 1 July 1955." Later Reynolds (1966) notes that "No mention is made of 'sand dunes' on the type sheet" Scott-Elliot 2937, at Kew.

Werner Rauh, the doyen of students of the Madagascan succulent and xerophytic flora, made nine trips to Madagascar (Dorr, 1997) and followed Reynolds in search of *A. bakeri*. Rauh (1964) included photos showing (a) *A. bakeri* "grosser Rasen auf einem Granitkopf bei Winanibé (Distr, Fort Dauphin)" [large clump on the granite hill at Winanibé, District Fort Dauphin] and (b) "kleinere Gruppe in der Kultur (Rauh M1407, 1959)" [a smaller group in cultivation].

Rauh (1995) described this as a species that "grows on sparsely covered granite outcrops near the fishing village Vinanibe, northwest of Tôlanaro. It grows in rock fissures which are deeply filled with a loose humus and is found with *Euphorbia milii* var. *imperatae* as well as the orchids *Angraecum sesquipedale* and *A. eburneum* var. *xerophilum*." In terms of the type of vegetation that this species forms a component part of, he says that "*Aloe bakeri* is not a typical element of the tropical rain forest but it is a component of a



Fig. 3 Closer view of the yellow-flowered form of *A. bakeri* (Photo: Marjorie Thorburn)

transitional vegetation to that of the drier southwestern bush region." In summary, *A. bakeri* was for both Reynolds and Rauh a common and thriving component in the vegetation near Fort Dauphin in the 1950s, but with a very localised distribution pattern.

Since then, however, the species has declined dramatically at this location. Corman & Mays (2008) recorded that "Norbert Rebmann and Philippe Corman, who visited southern Madagascar last year [2007], found that the inselberg near the airport at Fort Dauphin, where *Aloe bakeri* grew along with *Euphorbia milii* var. *imperatae*, was being destroyed. The stone was required for the development of the port! How many *Aloe bakeri* will survive at this site is not known at this stage, but it cannot be many, if any. Philippe Corman reports that they found only four

plants at the site which Rauh records as rocky.....However, as Scott-Elliot recorded sand dunes at the site in the original description, the existence of plants in sand cannot be excluded but neither Rebmann nor Corman were able to locate any plants in sand.”

Most recently Castillon & Castillon (2010) wrote that this species “is one of the most widespread in cultivation. Fortunately! Because it doesn’t exist anymore in the wild. Its only known station, a rocky hill near Taolagnaro, disappeared 2 years ago because of urban and industrial expansion due to the new commercial port.” They include a photo (2010: 239) showing the “type locality of *A. bakeri* half destroyed.”

The current assessment therefore is that *A. bakeri* is either on the brink of extinction or is actually extinct in the wild. From a conservation perspective this species needs to be assessed as at least *Critically Endangered* (CR) if it is not yet *Extinct in the Wild* (EW) based on the conservation status categories in the *IUCN Red List Categories and Criteria* (IUCN, 2001). It is regrettably not currently included in the Red List. The species does, however, receive some measure of protection from its inclusion in CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) Appendix I, where it is listed amongst 21 species of *Aloe*, the majority of which are Madagascan (CITES, 2018).

***Aloe bakeri* in cultivation**

In contrast to the situation in habitat, it is indeed fortunate that this species is now widespread in cultivation mainly as a result of the ISI distribution. Mays (1996) listed ISI 447 *Aloe bakeri* offered in the 1965 ISI distribution as “Rooted cuttings of *W. Rauh* #1407, collected in 1959 near Vinanibe, District Fort Dauphin, Madagascar.” This is the same collection as that illustrated by Rauh (1964). This is probably not the only clone in cultivation but it is possibly the only one with habitat data.

The plant is illustrated in Figs. 1, 2 & 4. It is small and branches freely from the base forming clumps of up to 100 branches (Reynolds, 1966) with stems up to 20cm long. Leaves are up to 15cm long and 1.4cm wide, sheathing at the base and tapering towards an acute tip, green with a reddish tinge adorned with numerous elongated pale spots. The leaf margin consists of pale cartilaginous short white teeth up to 1mm long and 7mm apart. The inflorescences (Figs. 2 & 4) are on average 25–30cm long, simple, and the raceme is

subcapitate up to 3–4cm long (Fig. 3) with up to 12 loosely-arranged flowers.

This species exists as two distinct flower colour forms: orange-red (Reynolds, 1966: 415, t.91) or predominantly yellow (Rauh, 1964: Figs. 2–4). Flowers of the commonly encountered clone ISI 447 are cylindrical with a slight basal swelling above the ovary, up to 25mm long, predominantly lemon yellow with the tepals having a prominent green mid-stripe, such that the yellow flowers are paler at the mouth with the distinct green stripe (Fig. 3). Individual flowers are open for up to 4–5 days.

This feature of two distinct flower colours occurs in several other *Aloe* species, most recently reported and illustrated for *Aloe pearsonii* in Namaqualand (Walker & Vanden Bon, 2018).

Additionally, Rauh (1995: 141, Figures 356 & 357) named and illustrated a new cultivar as *A. bakeri* ‘Concolor’ with “non-spotted leaves and yellow-red or yellow-green leaves” and “yellow flowers”. I have never seen this cultivar in any collection and it may no longer be extant.

With this species on the edge of extinction in the wild I urge all collectors to propagate and distribute material as widely as possible. I especially urge those with clones of known provenance to ensure that data are handed on with the propagations. It seems a vain hope that this species can be reintroduced and protected in its native Madagascar, so growers are under an obligation to ensure its continued existence in cultivation. It also needs to be stored in gene banks in the form of seed in cold storage, but currently this species is not part of the collection in the Millennium Seed Bank at Kew.

Close relatives

Scott-Elliot considered *A. bakeri* to be near to *A. aristata* Baker, a position today that is untenable, since this latter species now belongs in a monotypic genus with the binomial *Aristaloe aristata* (Haw.) Boatwr. & J.C. Manning.

For Reynolds (1966) *A. bakeri* did not appear to be closely allied to any other species but in habit with its elongated stems it might be allied to *A. millotii* Reynolds from Cap Sainte Marie at the southern tip of

Fig. 4 (Opposite) *Aloe bakeri*. 1: leafy branch and inflorescence; 2: longitudinal section of flower ×3. Painting by Cythna Letty from the collection of the South African National Biodiversity Institute (SANBI), Pretoria, reproduced here with permission. Previously published by Verdoorn (1963)



Madagascar. From its racemes and flowers but not vegetative features he allied it to *A. versicolor* Guillaumin from the Manampaniky Valley north-north-east of Fort Dauphin. Carter et al (2011) agree with Reynolds by suggesting that this species has no obvious relatives and in comparing *A. bakeri* to *A. millotii* and *A. versicolor*.

Cythna Letty the botanical artist

Finally I conclude with some notes on the artist whose work features in this article (Fig. 4) together with some background information on the publication in which the painting was first published.

South Africa has produced a significant number of extremely talented botanical artists and here I am pleased to showcase the work of one of these, Cythna Letty. Fig. 4 is based on a watercolour painting by Letty that was first published by Verdoorn (1963) in the periodical *The Flowering Plants of Africa (FPA)*. This journal began in 1921 and was unashamedly modelled on the more famous and longer running British journal *Curtis's Botanical Magazine (CBM)*, started in 1787 and still being published today. *FPA* reached Volume 65 in June 2017 and has published 2340 colour plates with accompanying text; each volume is now issued biannually. Unlike *CBM*, *FPA* has its geographical focus on African and Madagascan plants, but primarily southern African plants.

The work of Cythna Letty (1895–1985) exemplifies the talent of botanical artistry in South Africa. She contributed over 740 plates to *FPA* between 1945 and 1968. Arnold (2001) said that “Such was the quality of her work that Letty became the first botanical artist in southern Africa who captured the public’s imagination, and it must be acknowledged that her reputation was developed largely through her published work in [*FPA*]. Her obvious empathy with her subjects and her brilliant technique in handling large glossy surfaces on fruits and leaves are the hallmarks of this remarkable artist’s work.” She had a prodigious output of which *FPA* represents the main body of her work but her paintings also featured in at least four major books, of which *Wildflowers of the Transvaal* (1962) is the most famous of which she was also the author. In addition some of her floral designs are featured on three South African coins (Arnold, 2001).

ACKNOWLEDGEMENTS:

Roy Mottram is thanked for providing useful advice, scans and jpegs of relevant literature. Alicia Grobler of the South African National Biodiversity Institute (SANBI) Pretoria and current editor of *The Flowering Plants of Africa*, kindly provided assistance in the

reproduction of Cythna Letty’s original paintings of *Aloe bakeri*. Permission for reproduction was granted by Sandra Turck, Deputy Director of SANBI. Dallen Maree, also of SANBI, provided the scan of the original Cythna Letty painting. My wife Marjorie is thanked for her photos of our plant in flower and for comments on an earlier draft of this article. Al Laius kindly provided an additional reference.

LITERATURE:

- Arnold, M (2001) *South African botanical art. Peeling back the petals*. Fernwood Press in association with Art Link (PTY) Ltd, South Africa.
- Baker, J G (1902) *Aloe oligospila*. *Curt. Bot. Mag.* **128**: t.7834.
- Bertrand, A (1956) Un genre nouveau de Liliacées-Aloinées de Madagascar. *Guillauminia* gen. nov. *Cactus (Paris)* **11**: 41–42.
- Carter, S, Lavranos, J J, Newton, L E & Walker, C C (2011) *Aloes. The definitive Guide*. Kew Publishing, Kew/British Cactus & Succulent Society.
- Castillon, J-B & Castillon, J-P (2010) *Les Aloe de Madagascar/The Aloe of Madagascar*. Privately published, Etang-Salé, Ile de la Réunion.
- CITES (2018) *Convention on International Trade in Endangered Species of Wild Fauna and Flora. Appendices*. www.cites.org/eng/app/appendices.php (accessed 6 Nov 2018).
- Corman, P & Mays, H (2008) *Aloe bakeri* Scott-Elliot. *Alst. Int.* **8**(2): 2–4.
- Dorr, L J (1997) *Plant collectors in Madagascar and the Comoro Islands*. Royal Botanic Gardens, Kew.
- Grace, O M, Buerkl, S, Symonds, M R E, Forest, F, van Wyk, A E, Smith, G F, Klopper, R R, Bjorå, C S, Neale, S, Sebsebe Demissew, Simmonds, M S J & Rønsted, N (2015) Evolutionary history and leaf succulence as explanations for medicinal use in aloes and the global popularity of *Aloe vera*. *Evol. Biol.* **15**: 29 DOI 10.1186/s12862-015-0291-7.
- Heath, P V (1994) New nothogeneric names in the Asphodelaceae. *Calyx* **4**: 146–147.
- IUCN (2001) *IUCN Red List Categories and Criteria*. Version 3.1, 2nd ed. IUCN Council, Gland, Switzerland.
- Mays, H (1996) *The cyclopaedia of ISI plants 1958 – 1996*. The Haworthia Society, Preston.
- Newton, L E (2001) *Aloe* in U. Egli (ed.) *The Illustrated Handbook of Succulent Plants: Monocotyledons*. Springer Verlag, Berlin, etc, pp103–186.
- Perrier de la Bathie, H (1926) *Les Lomatophyllum et les Aloe de Madagascar*. *Mem. Soc. Linn. Normandie ser. 2 Bot.* **1**(1): 1–58, tt.1–9.
- Rauh, W (1964) Bemerkenswerte Sukkulente aus Madagaskar. 16. Die Aloe-Arten Madagaskars (Fortsetzung). *Kakt. and Sukk.* **15**: 217–221.
- (1995) *Succulent and xerophytic plants of Madagascar*. Volume one. Strawberry Press, Mill Valley, California.
- Reynolds, G W (1955) Hunting aloes in Madagascar. *African Wild Life* **9**: 298–319.
- (1958) *Les aloes de Madagascar*. Institut de Recherche Scientifique de Madagascar, Tananarive - Tsimbazaza.
- (1966) *The aloes of tropical Africa and Madagascar*. The Trustees, The Aloes Book Fund, Mbabane, Swaziland.
- Scott-Elliot, G F (1891) New and little-known Madagascan plants, collected and enumerated by G.F. Scott Elliot, M.A., B.Sc., F.L.S. *J. Linn Soc. Bot.* **29**: 1–67, tt.1–12.
- Verdoorn, I C (1963) *Aloe bakeri*. *Flow Pl. Afr.* **36**: t.1401.
- Walker, C C & Vanden Bon, A (2018) *Aloe pearsonii* – a unique species in habitat and in cultivation. *CactusWorld* **36**: 33–40 + cover.

Colin C Walker

School of Environment, Earth & Ecosystem Sciences, The Open University, Milton Keynes, MK7 6AA.

Email: c.walker702@btinternet.com

Layout by Gregory Bulmer