

## Reinstatement of *Aloe barbertoniae* Pole-Evans (Asphodelaceae: Alooideae) from northeastern South Africa

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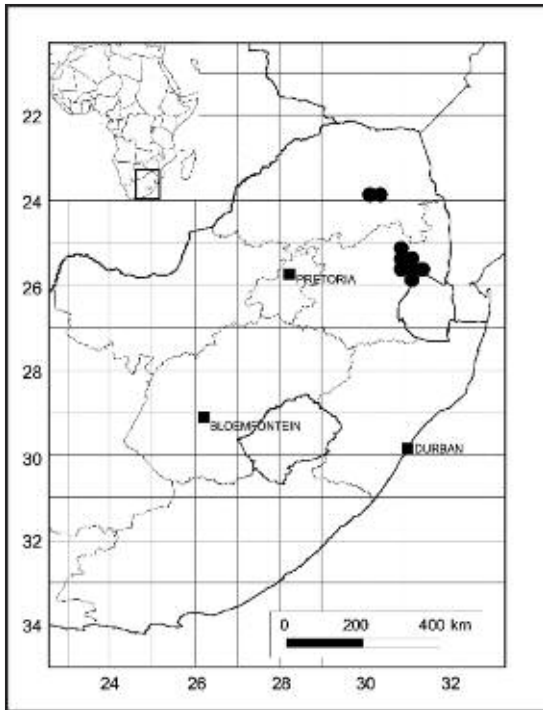
*Summary:* *Aloe barbertoniae* Pole-Evans, which has previously been included in the synonymy of *A. greatheadii* Schönland var. *davyana* (Schönland) Glen & D.S.Hardy, is here reinstated. This species is adapted to the subtropics of northeastern South Africa where it occurs in the Mpumalanga and Limpopo Provinces. It can be distinguished from *A. greatheadii* var. *davyana* by generally being a more robust plant with longer leaves and larger flowers, as well as an inflorescence that has more branches and that often re-branch. Although both the floral bracts and pedicels are shorter than in *A. greatheadii* var. *davyana*, the lowermost floral bracts of *A. barbertoniae* are markedly longer than the pedicels (not of equal length). The dull stripes on the perianth segments are less conspicuous than in *A. greatheadii* var. *davyana*.

*Zusammenfassung:* *Aloe barbertoniae* Pole-Evans, die bisher als Synonym von *A. greatheadii* Schönland var. *davyana* (Schönland) Glen & D.S.Hardy betrachtet wurde, wird hier wieder als Art klassifiziert. Diese Art ist an die subtropischen Bedingungen des nordöstlichen Südafrikas angepasst, wo sie in den Provinzen Mpumalanga und Limpopo vorkommt. Sie unterscheidet sich von *A. greatheadii* var. *davyana* durch die in der Regel robusteren Pflanzen mit längeren und grösseren Blüten, sowie durch den Blütenstand,

welcher mehr Zweige hat, die sich oft weiter verzweigen. Obwohl sowohl die blütentragenden Brakteen wie auch die Blütenstiele kürzer sind als bei *A. greatheadii* var. *davyana*, sind doch die untersten blütentragenden Brakteen von *A. barbertoniae* deutlich länger als die Blütenstiele (statt gleich lang). Die trüben Streifen auf den Perianthsegmenten sind weniger auffällig als bei *A. greatheadii* var. *davyana*.

### Introduction

Northeastern South Africa is host to a high density of species of *Aloe* L. (Holland, 1978), with the maculate complex particularly well-represented in this region (see, for example, Smith *et al.*, 2012 on summer-flowering maculates from northern South Africa). With their ability to hybridise and intergrade, the maculate aloes are amongst the most taxonomically challenging groups in the genus (Grace *et al.*, 2009, 2010). Recent fieldwork indicated that one of the eastern maculate aloes, *A. barbertoniae* Pole-Evans, warrants recognition at species level. It is here reinstated after it was reduced to synonymy under *A. greatheadii* Schönland var. *davyana* (Schönland) Glen & D.S.Hardy by Glen & Hardy (1987) along with several other taxa. The expanded concept of *A. greatheadii* Schönland (Glen & Hardy, 1987, 2000) has not been widely accepted and a number of other taxa from this complex have already been



**Figure 1.** Geographical distribution map of *Aloe barbertoniae*.

resurrected [e.g. *A. longibracteata* Pole-Evans (Carter *et al.*, 2011) and *A. graciliflora* Groenew. (Klopper *et al.*, 2011)].

### Distribution and habitat

*Aloe barbertoniae* was described by Pole-Evans (1917) from material collected at Rimer's Creek near Barberton, South Africa, by George Thorncroft in March 1914. Sterile material was brought to the gardens of the Division of Botany in Pretoria where it flowered in May 1915. It occurs along the eastern escarpment and Lowveld [from Barberton and Mbombela (Nelspruit) northwards to near Tzaneen], in the Mpumalanga and Limpopo provinces of South Africa (Figure 1).

Reynolds (1950) also reported populations of what appeared to be outlying forms of *A. barbertoniae* from near Weenen and Ulundi in KwaZulu-Natal. However, these plants differed from typical *A. barbertoniae* in several characters, including flowering time, and were later described as *A. vanrooyenii* Gideon F.Sm. & N.R.Crouch (Smith & Crouch, 2006a, b). Pole-Evans (1917) stated that specimens of *A. barbertoniae* were collected by Mr R.A. Davis in Swaziland. Given the close proximity of the type locality to Swaziland, this is not unlikely, although no records (herbarium specimens or otherwise) validating this statement have been found by the authors. Only a single



**Figure 2.** *Aloe barbertoniae* flowering in its natural grassland habitat near Mbombela (Nelspruit) in Mpumalanga, South Africa.

Photograph: Gideon F. Smith.

specimen from Swaziland with affinities to *A. greatheadii* var. *davyana* was encountered [Swaziland, no precise locality, flowered June 1934 at Cambridge (East London, Eastern Cape Province, South Africa), *G.G. Smith* 153a (PRE)]. However, examination of this specimen revealed that it is not conspecific with *A. barbertoniae*.

*Aloe barbertoniae* is near-endemic to the Barberton Centre of Endemism (Van Wyk & Smith, 2001). The climate in this region is temperate, with cool to mild winters and frequent fog at high altitudes. Although this aloe does well in cultivation, it is vulnerable to severe frost (Bornman & Hardy 1972). Average annual rainfall ranges from 625 to 750mm (Jeppe 1969).

The habitat occupied by this species ranges from open grassveld (Figure 2), to bushy slopes and warm river valleys in hilly country. It occurs in an area that often experiences temperatures of 37°C or more in summer and is frost free in winter (Reynolds, 1950; Jeppe, 1969). *Aloe barbertoniae* does not extend into the adjacent Highveld or Bushveld (Reynolds, 1950). Reynolds (unpub-



**Figure 3.** Rosette of *Aloe barbertoniae* consisting of distinctly spotted leaves. Photograph: Gideon F. Smith.



**Figure 4.** Rosette of *Aloe barbertoniae* with leaves less spotted. Photograph: Gideon F. Smith.

lished notes at PRE) concluded that this species prefers the valleys, especially those in mountainous country, as he did not encounter it higher up on steep slopes or in the topographically flatter areas at lower altitudes. It grows in coarse sandy soil (from granites of the Bushveld Igneous Complex) and in fine powdery loam (Groenewald, 1941).

### Characters and variation

*Aloe barbertoniae* is a medium-sized maculate aloe with a rosette height of under 0.5m and an inflorescence up to 1m. It is generally more robust than *A. greatheadii* var. *davyana* in all its characters. Plants usually present a solitary rosette of leaves up to 40cm long, with a distinct additional 10cm of dried twisted apex. The upper leaf surface



**Figure 5.** A raceme of *Aloe barbertoniae*. The flowers of this species are generally more intensely reddish in colour with paler stripes than those of *Aloe greatheadii* var. *davyana*. Photograph: Gideon F. Smith.

typically has numerous conspicuous white spots, while the lower surface is characteristically immaculate (a character shared with *A. greatheadii* var. *davyana*) (Figures 3, 4). The inflorescence is branched from about or below the middle and the lowest branches are often rebranched, usually giving rise to a total of six or more, narrow long cylindrical-acuminate, subdense racemes. The lowermost floral bracts are up to 20mm long and are markedly longer than the pedicels, which attain lengths of 12–14mm. Flowers are 36–40mm long and reddish pink with a slight bloom. Outer perianth segments have pale margins, but these are not as conspicuous as in *A. greatheadii* var. *davyana* (Figure 5). See Table 1 for further distinguishing characters between *A. barbertoniae* and *A. greatheadii* var. *davyana*.

Plants from Tzaneen differ from the typical form found near Barberton. The Tzaneen plants tend to have shorter flowers and floral bracts that are often longer than the measurements provided in the description of *A. barbertoniae*. Reynolds (unpublished notes at PRE) noted that this

	<i>A. barbertoniae</i>	<i>A. greatheadii</i> var. <i>davyana</i>
<b>Rosette</b>	usually solitary	solitary or suckering
<b>Leaf length</b>	30–40cm	up to 30cm
<b>Leaf (upper surface)</b>	green, with reddish brown tinge, most commonly with numerous elongated more or less confluent white spots in undulating interrupted transverse bands	green to dull brownish green, with numerous oblong, white spots, sometimes arranged in interrupted, wavy transverse bands
<b>Leaf (immaculate lower surface)</b>	pale green	pale glaucous green, obscurely lineate
<b>Marginal teeth</b>	5–6mm long	4–5mm long
<b>Leaf exudate</b>	drying yellow	drying purplish
<b>Inflorescence structure</b>	5–8-branched from below middle, lowermost branches further branched	3–5-branched from below middle
<b>Perianth colour</b>	dull reddish pink with a bloom, pale pinkish striped	pale pink to dull red, greenish to greyish striped
<b>Flower dimensions</b>	36–40mm long, 10–12mm across ovary, constricted above ovary to 5–6mm, widening to 7–8mm towards throat	32–35mm long, 7mm across ovary, constricted above ovary to 5mm, widening to 7mm towards throat
<b>Floral bracts</b>	15–20mm long	20–25mm long
<b>Pedicels</b>	12–14mm long	20–25mm long

**Table 1.** Characters distinguishing *Aloe barbertoniae* from *A. greatheadii* var. *davyana*.

species varies tremendously in several reproductive characters: inflorescence branching, density of flowers, shape of perianth, and particularly its floral bracts. His notes document that floral bracts and raceme length vary within populations. He observed that in some plants the floral bracts are broad, long and fleshy, whereas other individuals present bracts that are narrower, shorter and more scarious. Groenewald (1941) similarly reported *A. barbertoniae* as highly variable and concluded that this variation was attributable to edaphic factors.

In broad phylogeographic terms, *A. barbertoniae* is currently regarded as surrounded by *A. affinis* A.Berger, *A. longibracteata* and *A. graciliflora* to the west, *A. simii* Pole-Evans to the north, and *A. komatiensis* Reynolds and *A. parvibracteata* Schönland (and taxa currently included in it) to the east. At many localities *A. barbertoniae* does not grow in association with any other aloes (Reynolds, unpublished notes at PRE). How-

ever, this species does grow sympatrically with some of the other maculate aloes; this is evidenced by a record of a natural hybrid between *A. barbertoniae* and *A. komatiensis* found at Louw's Creek [*F. van der Merwe s.n.* (PRE24088), November 1936, held at PRE].

#### **Taxonomy and nomenclature**

***Aloe barbertoniae*** Pole-Evans in *T. Roy. Soc. S. Afr.* **5**: 706–707 (1917). Groenewald: 99 (1941); Jeppe: 93 (1969); Reynolds: 265–266 (1950 and later editions); Bornman & Hardy: 126–127 (1972); Grace *et al.*: 19 (2011).

**Type:** South Africa, Mpumalanga, Barberton, Rimer's Creek, coll. March 1914, fl. in Pretoria May 1915; *G. Thorncroft s.n.* (Holotype: BOL!).

Treated as a synonym of *A. greatheadii* Schönland var. *davyana* (Schönland) Glen & D.S.Hardy by several authors: Glen & Hardy: 490–491 (1987); Newton: 138–139 (2001); Glen & Hardy:

56 (2000); Van Wyk & Smith: 200 (2005); Grace: 130 (2009); Carter *et al.*: 177 (2011).

Acaulescent plants, sometimes with short stem; with persistent dried leaves; rosettes usually solitary. **Leaves** densely rosulate, erectly spreading, upper surface green, with reddish brown tinge, with numerous elongated more or less confluent white spots in undulating interrupted transverse bands, sometimes with few spots only, lower surface pale green and without spots, lanceolate-attenuate, 30–40cm long, 10–11cm wide, with additional 10cm of dried twisted apex; margin distinctly brown, with stout pungent deltoid teeth, 5–6mm long, 10–15mm apart; exudate clear, drying yellow. **Inflorescence** up to 1m high, arcuate-erect, 5–8-branched from below middle, lowest branches rebranching. **Raceme** cylindric-acuminate, 25–30cm long, subslax. **Floral bracts** narrowly deltoid-acuminate, 15–20mm long. **Pedicels** 12–14mm long. **Flowers**: perianth dull reddish pink with a bloom, pale pinkish striped, 36–40mm long, 10–12mm across ovary, abruptly constricted above ovary to form subglobose basal swelling, enlarging towards mouth, rather strongly decurved; outer segments free for 10 mm; **stamens** exserted to 1mm; **style** exserted 1–2mm. **Fruit** a capsule.

**Flowering time**: June–August

**Etymology**: Refers to Barberton in South Africa, a town near the type locality.

**Common names**: Barberton aloe (English); Barbertonse aalwyn (Afrikaans)

#### Specimens examined

SOUTH AFRICA, LIMPOPO PROVINCE.—2330: Pietersburg Distr., Tzaneen, (–CC), 4 July 1934, *G.G. Smith* 178 (PRE); July 1937, *F.Z. van der Merwe* PRE 38135 (PRE); 2 miles east of Tzaneen, (–CC), 26 May 1935, *G.W. Reynolds* 1370 (PRE); Thabina, 16 miles east of Tzaneen, (–CD), 26 May 1935, *G.W. Reynolds* 1371 (PRE).

SOUTH AFRICA, MPUMALANGA PROVINCE.—2530: Nelspruit Distr., 15 miles north of Nelspruit, (–BB), 1935, *L.E. Taylor* 2354 (PRE); Nelspruit, (–BD), October 1924, *C.N. Knox-Davies* PRE 15224 (PRE); 24 July 1929, *F.Z. van der Merwe* 261 (PRE); 17 July 1935, *G.W. Reynolds* 1453 (PRE); Nelspruit, Schagen, (–BD), 1936, *L.C.C. Liebenberg B and F* (PRE); Nelspruit, Brondal, (–BD), 17 July 1935, *G.W. Reynolds* 1456 (PRE); Lowveld Botanical Garden, garden side central area, (–BD), 23 June 1971,

*E.L. Buitendag* 834 (PRE); Nelspruit Distr., (–DB), July 1936, *F.Z. van der Merwe* A8 (PRE). 2531: Barberton Distr., Plaston, (–AC), September 1933, *W.E. Holt* 335 (PRE); Barberton, Clutha Siding, 8 miles northeast of Barberton, (–CA), 15 July 1935, *G.W. Reynolds* 1444 (PRE); Barberton, Noordkaap, 10 miles northeast of Barberton, (–CA), 15 July 1935, *G.W. Reynolds* 1443 (PRE); Barberton, Eureka, (–CA), July 1936, *F.Z. van der Merwe* A7 (PRE); 29 miles from Barberton on Kaap Muiden road, (–CB), 7 January 1929, *I.B. Pole Evans* 23 (PRE); Barberton, (–CC), July 1921, *F.A. Rogers* TRV 24027 (PRE); coll. 1931, fl. May 1933 in Rosebank, *G. Thorncroft s.n.* (BOL); September 1933, *G. Thorncroft* PRE 38150 (PRE); 8 miles west of Barberton, (–CC), 6 May 1935, *G.W. Reynolds* 1289 (PRE); 8 miles northwest of Barberton, (–CC), 14 July 1935, *G.W. Reynolds* 1439 (PRE); Barberton Shooting Range, (–CC), 17 September 1984, *H.F. Glen* 1277 (PRE); Barberton area, northeast of town, (–CC), 7 October 2004, *E. van Wyk & L.A. Nkuna* 874 (PRE); Ehlanzeni Distr., Barberton, R40 approximately 5 km north of Barberton, (–CC), 10 July 2007, *O. Grace, E. van Wyk, L.A. Nkuna & F.W. Mabatha* 85 (PRE).

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