



<https://doi.org/10.11646/phytotaxa.568.2.4>

Reinstatement of *Aloe longibracteata* (Asphodelaceae subfam. Aloioideae), a maculate aloe from northeastern South Africa

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Abstract

Aloe longibracteata (Asphodelaceae subfam. Aloioideae), a South African endemic aloe, which in the past has been regarded as belonging in the synonymy of *A. greatheadii* var. *davyana*, is reinstated as an accepted species. It differs from *A. davyana* var. *davyana*, which recently has been separated from *A. greatheadii*, in several reproductive morphological characters, most notably the fewer-branched inflorescences, much longer bracts, and the larger flowers and fruit, as well as the more densely-leaved rosettes. *Aloe longibracteata* is comprehensively compared to *A. davyana* var. *davyana*, illustrated, and a map of its natural geographical distribution range is provided. The typification of the name *A. longibracteata* is clarified and resolved, inter alia through designating an epitype.

Keywords: *Aloe davyana*, nomenclature, taxonomy

Introduction

Glen & Hardy (1987: 490) included *Aloe longibracteata* Pole Evans (1915: 25) (Fig. 1) (Asphodelaceae subfam. Aloioideae) in the synonymy of *A. greatheadii* Schönland (1904: 121) var. *davyana* (Schönland 1905: 288) Glen & Hardy (1987: 490) together with several other maculate aloes that have since been reinstated. These include *A. barbertoniae* Pole Evans (1917: 706) (see Klopper *et al.* 2014) and *A. graciliflora* Groenewald (1936b: 137) (see Klopper *et al.* 2011). The view to treat *A. longibracteata* as a synonym of *A. greatheadii* var. *davyana* was later repeated in Glen & Hardy (2000: 56). However, *A. davyana* Schönland (1905: 288) (Fig. 2) was recently reinstated as an accepted species with no synonyms recognised in it (Smith *et al.* 2020). Three varieties are accepted in this predominantly central South African species: the autonymic one, *A. davyana* var. *subolifera* Groenewald (1939: t. 732) (see Smith *et al.* 2021a), and *A. davyana* var. *magdae* Smith (2022: 266). Moreover, *A. labiaflava* Groenewald (1936a: 57), which was treated as a hybrid between *A. davyana* and *A. longibracteata* by Reynolds (1950: 293) and as a synonym of *A. greatheadii* var. *davyana* by Glen & Hardy (1987: 490, 2000: 56), was also recently shown to be an accepted species (Smith & Klopper 2021). All these species are included in *Aloe* Linnaeus (1753: 319) sect. *Pictae* Salm-Reifferscheidt-Dyck (1837: Sect. 23, page unnumbered), an infrageneric group referred to as the ‘maculate aloes’ in the vernacular.

Aloe longibracteata has been recognised at species rank in some accounts of the genus, for example in Carter *et al.* (2011: 165), Grace *et al.* (2011: 90–91), Van Wyk & Smith (2014: 248–249), and Newton (2020: 598). However, *A. longibracteata* is yet to be formally reinstated as an accepted species. We do so here. Based on reproductive morphological evidence, *A. longibracteata* is a unique and distinctive species that cannot be confused with *A. davyana*. In this paper, *A. longibracteata* is compared to *A. davyana* var. *davyana* (Table 1), illustrated, and a map of its natural geographical distribution range is provided. An epitype is designated for the name *A. longibracteata*.

Material and Methods

The description of *A. longibracteata* is based on detailed, comparative morphological studies of material of this species and *A. davyana* var. *davyana* across a range of locations where these two species are known to occur in northeastern South Africa, especially in the Mpumalanga and Limpopo provinces of the country. Herbarium vouchers held at Herbs K, NBG, and PRE were also consulted. Measurements were taken by hand using a ruler, except for floral measurements below 4 mm, which were taken using hand-held magnifying equipment.

In the discussions that follow, '*A. davyana*' refers to the autonymic variety only, as *A. davyana* var. *subolifera* has a considerably more westerly distribution range than *A. longibracteata*, forms large, suckering clumps, has shorter, smaller leaves and consequently rosettes, longer, laxer inflorescences and shorter flowers, and its flowers are generally lighter in colour. The recently described *A. davyana* var. *magdae* has a more southwesterly distribution range than *A. longibracteata* and it has inflorescences with 3–7 branches and shorter racemes, and narrower flowers that are bright orange-red to bright red. These varieties therefore differ significantly from *A. longibracteata*.

Author attribution of the scientific plant names cited follow IPNI (2022+) although in the notation required by *Phytotaxa*, i.e., they are cited as fully bibliographic references, and herbarium codes follow Thiers (2022 [continuously updated]). Nomenclatural issues accord with the Shenzhen Code (Turland *et al.* 2018).

Results

Aloe longibracteata usually grows as solitary specimens (Figs 1, 3 & 4), while *A. davyana* (Fig. 2), with which it grows socially at some localities, is most often found in clusters of about four rosettes. Rosettes of *A. longibracteata* tend to be more densely leaved, and the leaves thicker, i.e., more fleshy, than those of *A. davyana*.

The differences between *A. longibracteata* and *A. davyana* manifest especially in reproductive morphological characters (Table 1). At maturity, plants of *A. longibracteata* usually produce two inflorescences successively (Fig. 1), while plants of *A. davyana* usually produce up to three inflorescences simultaneously or successively (Fig. 2). Inflorescences of *A. longibracteata* generally have fewer branches (up to three) than those of *A. davyana* (3–5-branched). The developing inflorescences of *A. longibracteata* are prominently covered by the conspicuous bracts (Fig. 5). In fact, *A. longibracteata* has the longest floral bracts of all the maculate aloes (Reynolds 1950).

The apical portion of the racemes of *A. longibracteata* usually is curved to one side and not erect, as in *A. davyana*. These often cat tail-like, curved racemes of *A. longibracteata* have flowers that are usually strawberry-pink to peach-red, with the mouth paler—yellowish white—than the rest of the flower (Figs 6 & 7). In *A. davyana* on the other hand, flower colour is in general somewhat variable, ranging from pale flesh-pink to dull brick-red with greenish to greyish, longitudinal stripes (Fig. 2). In both species the apical portions of the perigone segments could be light yellowish on the inside. The free portions of the perigone segments of the flowers of *A. davyana* and *A. longibracteata* are generally not flared, but can somewhat spread.

An often overlooked character difference between *A. davyana* and *A. longibracteata* is that, at $30(-35) \times 15(-20)$ mm, the fruit of *A. longibracteata* is larger than that of *A. davyana* (see row 8 in Table 1) (Fig. 8).

TABLE 1. Differences among *Aloe davyana* and *A. longibracteata*.

#	Character	<i>Aloe davyana</i>	<i>Aloe longibracteata</i>
A.		Vegetative	
1.	Clumping (no. of rosettes)	2–4	Usually solitary
B.		Reproductive	
2.	No. of inflorescences	1–3, simultaneous or successively	(1–)2, successively
3.	No. of inflorescence branches	Usually 3–5	Usually up to 3(–4)
4.	Raceme length (cm)	15–20(–30)	30–40
5.	Fertile bract length (mm)	20–25	45–50
6.	Flower length (mm)	32–35	40–50
7.	Perianth colour externally	Pale flesh-pink to dull brick-red, greenish to greyish striped	Strawberry-pink to peach-red, mouth much paler and yellowish
8.	Fruit size (mm)	(20–)25 × 15	30(–35) × 15(–20)

In a study of leaf surface morphology in *Aloe*, Grace (2009) noted that *A. longibracteata* is likely more closely related to *A. greatheadii* than to *A. davyana*.



FIGURE 1. *Aloe longibracteata* usually grows in the often dense, fire-prone grass and forb layer in savanna vegetation or on rocky outcrops as solitary to sparsely (1- or 2-)branched rosettes. The rosettes mostly produce up to 4-branched inflorescences per flowering season. Photograph: Gideon F. Smith.



FIGURE 2. *Aloe davyana* var. *davyana* generally has pale flesh-pink to dull brick-red flowers. Rosettes usually grow in small clusters. Photograph: Gideon F. Smith.



FIGURE 3. The leaves of *Aloe longibracteata* are often almost immaculate adaxially. Photograph: Gideon F. Smith.



FIGURE 4. The abaxial leaf surfaces of *Aloe longibracteata* are light green to yellowish green. Plants usually grow as solitary rosettes. Photograph: Gideon F. Smith.



FIGURE 5. In developing inflorescences, including in the younger, fire scorched one, the long bracts for which the species was named, are very prominent. Photograph: Gideon F. Smith.



FIGURE 6. The inflorescences of *Aloe longibracteata* are often cat tail-like curved. Photograph: Gideon F. Smith.



FIGURE 7. The flowers of *Aloe longibracteata* are \pm uniformly shiny strawberry-pink to peach-red in the lower $\frac{1}{2}$, with the mouth slightly paler. Photograph: Gideon F. Smith.

Taxonomic treatment of *Aloe longibracteata*

Aloe longibracteata Pole Evans (1915: 25)

Also treated in: Pole Evans (1928: t. 299), Groenewald (1941: 71, 104, 167), Reynolds (1950: 262), Judd (1967: 27, plate 7), Jeppe (1969: 92), Bornman & Hardy (1971: 125), Jacobsen (1977: 86), Jacobsen (1986: 174), Van Wyk & Smith (1996: 204), Smith (2003: 33), Van Wyk & Smith (2003: 208), Grace (2009: 119), Carter *et al.* (2011: 165), Grace *et al.* (2011: 90–91), Van Wyk & Smith (2014: 248–249), Klopper (2015: 345, 597), Newton (2020: 598).

Type:—SOUTH AFRICA, Mpumalanga, Lydenburg, May 1914, *I.B. Pole Evans 56* (holotype PRE PRE0086205-0 [Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.pre0086205-0>]).

Epitype (here designated):—SOUTH AFRICA, Mpumalanga province, Lydenburg, collected May 1914, flowered at Laboratory, Pretoria, 8 June 1916, *Pole Evans 56* (epitype PRE PRE0086134-0 [Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.pre0086134-0>]; isoeptype K K000256636 [Image available at <https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000256636>]).

Notes on the holo- and epitype of the name *Aloe longibracteata*:—In the protologue of the name *A. longibracteata*, Pole Evans (1915: 25) states that: “This plant was collected by myself near Lydenburg in the Transvaal in May, 1914. It grows in open grass country at an altitude of 5,000–6,000 ft., and flowers from June to July.” Herb. PRE holds a specimen of *A. longibracteata*, *Pole Evans 56*, that has information associated with it that corresponds to the collecting date and place stated in the protologue (Pole Evans 1915: 25). This information satisfies Turland *et al.* (2018: Art. 40.3 Note 2) because concrete reference to some detail relating to the actual type, such as collector’s name [I.B. Pole Evans] or date [May 1914], was provided—it was not mere citation of a locality.



FIGURE 8. The fruit of *Aloe longibracteata*, illustrated here, is larger than those of *A. davyana*. The dimensions of the bottom-most capsule in the photograph are 32 × 18 mm. Photograph: Gideon F. Smith.

However, there are two sheets of *Pole Evans 56* at Herb. PRE: one (PRE0086205-0), the holotype, is dated May 1914, while the other one (PRE0086134-0) indicates that the *plant* was collected in May 1914, but that it *flowered* two years later at the [Botany] Laboratory in Pretoria (see Smith *et al.* 2021b for a discussion on aloe research and cultivation there), on 8 June 1916, when that specimen was made. This second specimen is therefore not an isotype (duplicate of the holotype).

On a determination slip by Hugh Glen and Dave Hardy, dated 1991-04-04 where they identified the material as “*Aloe greatheadii* var. *davyana*”, these two specimens are indicated as “Holotype of synonym, Sheet 1 of 2” (PRE0086134-0, 8 June 1916) and “Holotype of synonym, Sheet 2 of 2” (PRE0086205-0, May 1914). However, the sheet numbers were not indicated as such when the specimens were originally prepared and accessioned in Herb. PRE, and these two specimens therefore cannot be regarded as sheets of the same collection, especially also since it does not constitute a single collecting event (Turland *et al.* 2018; Articles 8.2 and 8.3) because of the different dates on the sheets. Furthermore, labeling a specimen does not constitute effective publication and designation of a type cannot be achieved in this way (Turland *et al.* 2018: Art. 7.10).

Note that Reynolds (1950: 263), without citing a collecting number for the “I. B. Pole Evans” gathering, referred to a specimen collected by Pole Evans that “Fl. May 1914 at Union Buildings” and doubtfully regarded it as the type—he stated “(?Type)”. As we show above this plant only flowered in 1916 and the specimen does not represent the holotype, nor original material. At any rate, if the name *A. longibracteata* did not have a holotype, an author must definitely accept the designation of a type for it to be effective (Turland *et al.* 2018: Art. 7.11).

The sheet at Herb. PRE (PRE0086205-0) dated May 1914 is thus the holotype of the name *Aloe longibracteata*. The other sheet at Herb. PRE (PRE0086134-0) dated 8 June 1916 was evidently prepared from material that was collected along with the plant pressed and preserved as the type. It flowered in Pretoria two years later, and therefore after publication of the name *A. longibracteata* in 1915. It can therefore not be regarded as original material. A sheet of *Pole Evans 56* at Herb. K, dated 1916/06/08, has a label that is identical to that of the specimen with the same date at Herb. PRE. It was accessioned at Herb. K on 2 March 1920 and contains a hand-written note in pencil: ‘Not TYPE number—probably from type plant’. We regard this assumption as correct and this specimen is a duplicate of the one at Herb. PRE (PRE0086134-0) with the same date.

Since the holotype (PRE0086205-0) of *A. longibracteata* only consists of a partial infructescence and an envelope with seeds, the Herb. PRE specimen dated 8 June 1916 (PRE0086134-0; consisting of a leaf, cross section through the leaf, and an inflorescence) is here designated as epitype, with the duplicate at Herb. K (consisting of a leaf, inflorescence, and an envelope with leaf fragments, flowers, fruit, and seed) being an isoepitype.

Description:—Plants small, low-growing, solitary, rarely 1- to 2-branched from the base, rosette erect to slightly leaning, up to (10–)15 cm tall. *Stem* ± absent, short, simple and thickened lower down if present, clothed in very hard, persistent, twisted, dried leaves. *Leaves* very densely rosulate, at first erect, then horizontally spreading, 10–15 cm long, (7–)9–10 cm wide at base, dull light to dark green, deltoid-lanceolate, abaxially pale green, longitudinally darker green or light purplish-lined, lines very narrow, adaxially sparsely white-spotted especially towards base or immaculate, white spots ± oblong to oval, sometimes arranged in interrupted, obscure, wavy transverse bands, texture smooth; margins shiny-orange-brown to shiny-dark brown, armed with prominent, short, very pungent, deltoid, shiny-brown, dark-tipped teeth, ± 5–7(–9) mm long, 3–5(–9) mm apart, variously curved towards leaf base or more rarely straight. *Inflorescence* usually 1–2 produced successively per season, unbranched raceme or 2- to 3(–4)-branched panicle, 0.5–0.7(–0.8) m tall, erect, often apically cat tail-like curved, branched at or below middle, branches erect at narrow angle from peduncle; peduncle rather stout, lacking sterile bracts below racemes, panicle branches subtended by prominent fertile bracts irregularly deltoid to lanceolate-triangular, ± 25–50 mm long, usually dark to light brown, drying rapidly, longitudinally dark brown lined. *Racemes* narrowly cylindrical, distinctly tapering upwards, 20–30 cm long, ± 4–6 cm wide where flowers are at anthesis, usually rather densely flowered; buds erect to erectly spreading, flowers pendulous at anthesis. *Floral bracts* prominent, narrowly lanceolate, variously twisted, ± 45–50 mm long, longer than pedicels, much narrower than fertile bracts, drying rapidly, light brown to creamy white. *Pedicels* (10–)15–20(–25) mm long, yellowish green when young, becoming reddish with age. *Flowers: perianth:* buds uniformly shiny strawberry-pink to peach-red, prominently green-striated in apical half; open flowers ± uniformly shiny strawberry-pink to peach-red in basal ½, mouth slightly paler and yellowish white inside, 40–50 mm long, ± 7–8 mm across ovary, narrowed above ovary to yield small bulbous base, distinctly enlarged towards mouth, middle ± gradually enlarging towards mouth, ± straight to down-curved to horizontally spreading; tips of segments spreading, outer segments free for ½–½ of their length; *stamens* with filiform-flattened filaments, uniformly light yellow, hardly exerted; *ovary* (6–)7(–8) mm long, 2–3 mm in diam., light green; *style* slightly exerted, uniformly light yellow; *stigma* tiny, very slightly capitate, yellowish. *Fruit* a loculicidal capsule, 30(–35) × 15(–20) mm, light green turning purplish light brown with

age, dry remains of perianth variously persistent. *Seed* 2 × 3 mm, black, ± D-shaped, angled, with prominent white to transparent wing. *Chromosome number*: 2n = 14 (Groenewald 1941: 167, Riley & Majumdar 1979: 46).

Distribution:—*Aloe longibracteata* has a fairly restricted distribution in northeastern South Africa, mainly west of the escarpment, where it occurs from Mashishing (formerly Lydenburg) to Dullstroom in Mpumalanga Province, to Polokwane (formerly Pietersburg) and Tzaneen in Limpopo Province, South Africa (Fig. 9). It is especially common around Mashishing.

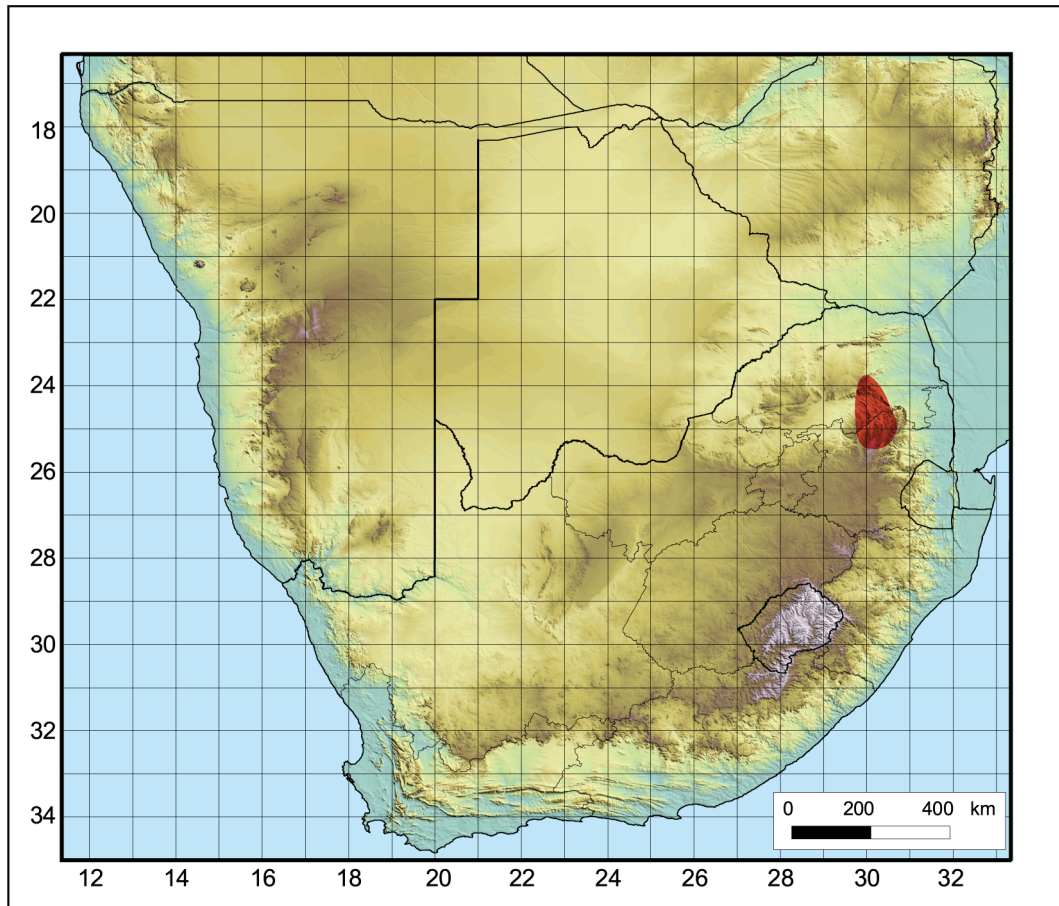


FIGURE 9. Known natural geographical distribution range of *Aloe longibracteata*.

Flowering time:—Mostly (June–)July–August, but some forms can flower as late as November.

Additional specimens investigated:—SOUTH AFRICA. Mpumalanga: Middelburg district, Farm Hartbeeshoek west of Belfast, 10 June 1995, *P.M. Burgoyne 3735 & 3754* (PRE). Between Lydenburg and Dullstroom, 26 June 2007, *O.M. Grace, E. van Wyk, L. Nkuna, F.W. Mabatha 66* (K, 2 sheets). Lydenburg, 21 August 1914, *I.B. Pole Evans 19* (PRE); *ibidem*, 22 July 1919, *ibidem, I.B. Pole Evans 220* (PRE, 2 sheets); 15 August 1921, *I.B. Pole Evans 239* (PRE, 2 sheets). Lydenburg, south of town, 7 August 2021, *G.F. Smith 1157* (PRU); *ibidem*, 3 September 2021, *G.F. Smith 1163* (PRU). Lydenburg, Sukukuni, Farm Avontuur, 30 June 1936, *W.G. Barnard 532* (PRE). Lydenburg, Buffelsvlei, 20 July 1935, *G.W. Reynolds 1466* (PRE). Northwest of Lydenburg, 20 July 1935, *G.W. Reynolds 1460* (PRE, 2 sheets). North of Lydenburg, near Potloodspruit, 19 June 1937, *G.W. Reynolds 2470* (K; PRE); *ibidem*, 2 August 1938, *G.W. Reynolds 2885* (K; PRE). Martins Hoop, from Lydenburg on road to Magnet Heights, 12 July 1936, *G.W. Reynolds 1961* (K; PRE). West of Hangslaagte, top of Dwarsriviersberg, 12 July 1936, *G.W. Reynolds 1959* (K, 2 sheets; PRE, 2 sheets). Lydenburg, Sekukuniland, Schoonoord, west of Lulu Mountains, 12 July 1936, *G.W. Reynolds 1956* (K, 2 sheets; PRE). Sekhukhuniland, Lulu Mountains, Farm Groot Vygenboom, 3 September 1936, *A.O.D. Mogg 16982* (PRE). Graskop, The Bonnet area, 19 June 1990, *W.S. Matthews 920* (PRE). West of Pilgrims Rest, 12 November 1952, *W. Marais 16* (K; PRE).

SOUTH AFRICA. Limpopo: Ohrigstad Dam Nature Reserve, 6 August 1968, *D. Edwards 4051* (K; PRE); *ibidem*, 28 August 1973, *N Jacobsen 2951* (PRE). East of Ohrigstad, Brown's Hill, 17 November 1935, *G.W. Reynolds 1648* (PRE). Ohrigstad to Penge, 22 August 1973, *J.P. Nel 339* (K; NBG; PRE). Lekgalameetse Nature Reserve, 2 June 1986, *M. Stalmans 1312* (PRE). Strydom Tunnel towards Ohrigstad, 23 June 1971, *E. Buitendag 846* (NBG; PRE).

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