

## Aspects of the taxonomy of *Aloe arborescens* Mill. (Asphodelaceae: Alooideae)

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**Summary:** Taxonomic concepts in the morphologically variable *Aloe arborescens* Mill. are discussed. Previous approaches to the taxonomy of this species varied from describing aberrant material as new entities, using formal taxonomic categories, to selecting forms with horticulturally desirable characters and naming these as cultivars. We propose that in the case of this species, the preferred approach to recognise variation among entities in horticulture should be at the level of cultivars, rather than formal taxonomic entities at infraspecific ranks. It is only after extensive fieldwork throughout the complete distribution range of this species and intensive research, including all possible forms of data (morphological, anatomical, chemical, molecular, etc.), that any formal distinctions at infraspecific level can be made.

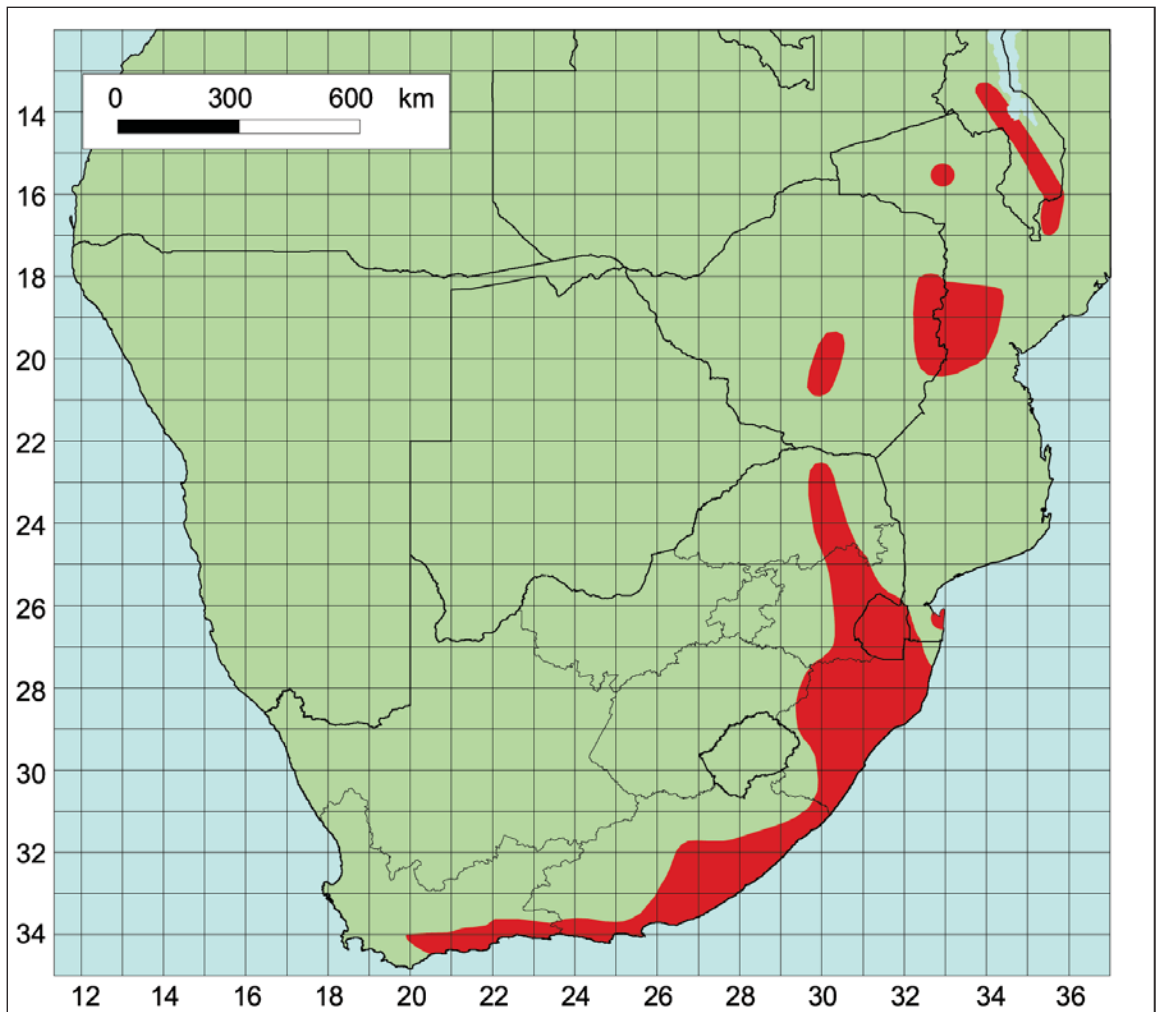
**Zusammenfassung:** Die taxonomischen Konzepte innerhalb der morphologisch variablen *Aloe arborescens* Mill. werden diskutiert. Frühere Versuche bezüglich der Taxonomie dieser Art variierten, und abweichendes Material wurde entweder unter Nutzung formeller taxonomischer Kategorien als neue Taxa beschrieben, oder ausgewählte Formen mit gärtnerisch erwünschten Merkmalen wurden als Cultivare behandelt. Wir schlagen vor, dass für diese Art gärtnerisch wichtige taxonomische Einheiten bevorzugt als

Cultivare behandelt werden sollten, statt als formelle taxonomische Einheiten auf Ebenen unterhalb der Art. Formelle Unterscheidungen auf Ebenen unterhalb der Art können erst gemacht werden, wenn die Art aufgrund intensiver Forschungen über das gesamte Verbreitungsgebiet im Rahmen von Feldarbeit unter Einbezug aller möglichen Formen von Daten (morphologisch, anatomisch, chemisch, molekular, etc.) untersucht worden ist.

### Introduction

Geographically, *Aloe arborescens* Mill. is one of the most wide-ranging species in the genus *Aloe* L. It occurs from the Cape Peninsula (where it is arguably naturalised), through the southern and eastern regions of South Africa, and further north to Mozambique and the eastern mountains of Zimbabwe and Malawi (Figure 1). The very broad geographical amplitude of *A. arborescens* is mirrored in a similarly broad range of variation in most of its vegetative and reproductive characters. Adding to this variation is the ease with which *A. arborescens* hybridises with a variety of other aloes (Reynolds, 1950).

*Aloe arborescens* has been reported to have several medicinal uses, including significant wound-healing, anti-bacterial, anti-ulcer, anti-inflammatory, anti-carcinogenic, alopecic and anti-fungal activity (Lane, 2004; Bosch, 2008; references cited



**Figure 1.** Geographical distribution map of *A. arborescens*.

by Smith *et al.*, 2008). However, probably its most popular use is in the treatment of burns and wounds (Reynolds, 1950; Lane, 2004; Bosch, 2008). It received worldwide attention after the second World War, when the value of a gel prepared from its leaves was demonstrated, following its application to skin burns of victims of the nuclear bombs dropped on Japan (Bosch, 2008). It is surprisingly very little used for its medicinal properties in its native range (Smith *et al.*, 2008), but is very highly esteemed in Asia and the Mediterranean (Bosch, 2008). A leaf decoction is reportedly given to women to ease childbirth in South Africa (Reynolds, 1950). In Japan, leaves are widely used as a vegetable, a health food to ease constipation, and as a purgative and for dermatological use (Bosch, 2008). Watt & Breyer-Brandwijk (1962) also reported the use of a cold infusion of *A. arborescens* as a drench in the treatment of sick calves.

The krantz aloe readily grows from cuttings and seed. It has been in cultivation at the Dutch East India Company's Gardens in Cape Town, South Africa, since at least 1695 (Reynolds, 1950; West, 1974) and also in Japan since the 17<sup>th</sup> century (Bosch, 2008). Today it is widely cultivated in the tropics and subtropics, and is an extremely popular garden plant in the Mediterranean region (West, 1974; Lane, 2004; Bosch, 2008; Smith & Van Wyk, 2008). It is commercially grown in Italy (for its medicinal and cosmetic uses), Japan (as medicine and food) and recently also in Israel and China (Bosch, 2008).

Not surprisingly, the wide ecological amplitude of the species and its popularity in horticulture, has also enabled it to successfully colonise localities remote from its natural habitat (Webb, 1980; Forster & Clifford, 1986; Reynolds & Herring, 1991), becoming naturalised in Japan



**Figure 2.** *A. arborescens* forms dense, much-branched shrubs with apical leaf rosettes and usually simple inflorescences (Kowyn's Pass, Mpumalanga, South Africa). Photo: Neil R. Crouch. **Figure 3.** Leaves of *A. arborescens* are often greyish green with yellow marginal teeth (cultivated). Photo: Ronell R. Klopper. **Figure 4.** The characteristic elongated inverted-conical, dense raceme with cylindrical flowers of *A. arborescens* (cultivated). Photo: Gideon F. Smith. **Figure 5.** *A. arborescens* often grows on rocky slopes and outcrops (Kaapschehoop, Mpumalanga, South Africa). Photo: Neil R. Crouch.





**Figure 6.** Epiphytic *A. arborescens* plants are sometimes encountered (Graskop, Mpumalanga, South Africa). Photo: Neil R. Crouch. **Figure 7.** Leaves become reddish in winter in certain regions, for instance at Ongoya Forest, northern KwaZulu-Natal, South Africa. Photo: Arrie W. Klopper. **Figure 8.** Leaves can be a yellowish green, as in the western Soutpansberg, Limpopo, South Africa. Photo: Arrie W. Klopper. **Figure 9.** Racemes of *A. arborescens* can be narrowly conical or broadly conical as in this yellow form (cultivated). Photo: Arrie W. Klopper.

(Bosch, 2008) and invasive in Portugal (Smith & Figueiredo, 2009).

We consider here aspects of the morphological variation encountered in *A. arborescens*. It is proposed that the most practical approach to the taxonomy of *A. arborescens* is to recognize horticultural forms as cultivars. Establishing formal infraspecific names at the subspecific and varietal categories will lead to an inordinate and undesirable proliferation of names. Such formal distinction will only be possible after extensive research.

### Variation in *Aloe arborescens*

Although *A. arborescens* is morphologically extremely variable, it can nevertheless be diagnosed by a suite of characters. It forms much-branched shrubs up to 5 m tall, with the leaves in dense rosettes at the branch apices (Figure 2). Leaves are usually greyish green with yellowish teeth (Figure 3). Inflorescences are usually simple to once-branched with elongated inverted-conical, dense racemes, with large floral bracts and the pedicels twice as long as the cylindrical flowers (Figure 4). Outer segments of the flowers are free to the base. Its closest relatives are *A. mutabilis* Pillans from northwestern South Africa and eastern Botswana (Van Wyk & Smith, 2005), *A. hardyi* Glen from Limpopo, South Africa (Glen, 1987; Glen & Hardy, 2000), and *A. pluridens* Haw. from the Eastern Cape and KwaZulu-Natal, South Africa (Carter *et al.*, 2011). *Aloe arborescens* usually grows in pockets of rich soil on rocky slopes and outcrops (Figure 5), sometimes in dense bush or even as an epiphyte (Figure 6), in mountains in areas of high summer rainfall, but is also present in the winter rainfall region of the Western Cape, South Africa. It occurs at altitudes from near sea-level to 2,800 m.

Morphological variation in *A. arborescens* can most often be seen in the leaves and racemes. Leaves vary in length and width among different populations. Leaves are usually dull green, but can become reddish in winter in certain regions (e.g. part of northern KwaZulu-Natal, South Africa) (Figure 7) or can even be yellowish green (as in the Soutpansberg, Limpopo, South Africa) (Figure 8). Racemes vary from broad (Figure 9) to narrowly conical, while the flowers and pedicels can also vary in length (Reynolds, 1950; Bornman & Hardy, 1971). Flowers are mostly scarlet, but can range in colour from yellow (Reynolds, 1950) to salmon or orange. At the north of its distribution range in Malawi, *A. arborescens* is very large, while smaller forms occur in Zimbabwe and South Africa (Lane, 2004). It forms robust, thick-stemmed shrubs in some areas (Figure 10),

while in others plants are low straggly bushes with fairly thin stems (Figures 11 & 12).

*Aloe arborescens* is known to hybridise regularly with a number of other aloes (Figure 13) (Reynolds, 1950; Bosch, 2008) across many of the Sections established by Berger (1905), from the tall tree-like *Aloidendron* to the relatively diminutive grass-like *Leptoaloe*. This is a consequence of both the widespread distribution of *A. arborescens* – usually locally abundant when found, and highly floriferous – as well as its sympatric occurrence with many other aloe species, most of which similarly have a diploid chromosome number of  $2n = 14$  (Riley, 1959). This ability to hybridise occurs in spite of a somewhat restrictive breeding system in *A. arborescens*, the flowers of which are self-incompatible due to a mechanism acting in the ovary (Hargreaves *et al.*, 2012). A total of 15 known natural crosses were listed by Reynolds (1950) for *A. arborescens*, a number only exceeded by *A. marlothii* crosses (Reynolds, 1950). Several more hybrid combinations have been identified since, many arising in cultivation (see Boxes 1 & 2). The result of these hybrids breeding back into the original population generates yet further morphological variation, so complicating an already involved picture. Dominant characters that are usually retained in hybrids of *A. arborescens* are branched stems, characters of the somewhat sickle-shaped leaves and their marginal teeth, long pedicels and the shape of the flowers (Reynolds, 1950). Characters reported by Reynolds (1950) to usually be incorporated from the other hybrid parent are tall stems, unspotted leaves, simple inflorescences, and the colour and length of the flowers. These hybridisation patterns might in part explain the documented variation in particular characters of *A. arborescens*, e.g. the length of the stems, and the length and colour of the flowers.

### Infraspecific taxa

Perhaps somewhat surprisingly, only one infraspecific entity, *Aloe arborescens* subsp. *mzimnyati* Van Jaarsv. & A.E. van Wyk, has been upheld in *A. arborescens* in recent publications (Carter *et al.*, 2011; Grace *et al.*, 2011). This taxon is endemic to the lower Mzimnyati River in KwaZulu-Natal, South Africa, where it grows in rock crevices on sheer, east- and south-facing, quartzitic sandstone cliffs at an altitude of  $\pm 500$  m. It differs from the typical subspecies in having a smaller growth habit, forming rounded shrubs of up to 0.50–0.75 m high. Flowers are smaller than in the typical subspecies (22–25 mm long, instead of  $\pm 40$  mm long), slightly clavate and variable



### Box 1. Known hybrid combinations

- A. arborescens* Mill. × *A. affinis* A.Berger (Reynolds, 1950)  
*A. arborescens* Mill. × *A. barbertoniae* Pole-Evans (Reynolds, 1950)  
*A. arborescens* Mill. × *A. cameronii* Hemsl. (Reynolds, 1966)  
*A. arborescens* Mill. × *A. candelabrum* A.Berger (Jeppe, 1974)  
*A. arborescens* Mill. × *A. capitata* Baker (Reynolds, 1966)  
*A. arborescens* Mill. × *A. chortolirioides* A.Berger var. *chortolirioides* (Reynolds, 1950)  
*A. arborescens* Mill. × *A. chortolirioides* var. *woolliana* (Pole-Evans) Glen & D.S.Hardy (Jeppe, 1974)  
*A. arborescens* Mill. × *A. cooperi* Baker (Jeppe, 1974)  
*A. arborescens* Mill. × *A. cryptopoda* Baker (Reynolds, 1950)  
*A. arborescens* Mill. × *A. ferox* Mill. (Reynolds, 1950)  
*A. arborescens* Mill. × *A. glauca* Mill. (Reynolds, 1950)  
*A. arborescens* Mill. × *A. lineata* (Aiton) Haw. var. *lineata* (Glen & Hardy, 2000)  
*A. arborescens* Mill. × *A. lineata* var. *muirii* (Marloth) Reynolds (Jeppe, 1974)  
*A. arborescens* Mill. × *A. inyangensis* Christian (Reynolds, 1966)  
*A. arborescens* Mill. × *A. maculata* All. (Reynolds, 1950)  
*A. arborescens* Mill. × *A. marlothii* A.Berger (Reynolds, 1950)  
*A. arborescens* Mill. × *A. mitriiformis* Mill. (Glen & Hardy, 2000)  
*A. arborescens* Mill. × *A. nubigena* Groenew. (Jeppe, 1974)  
*A. arborescens* Mill. × *A. petricola* Pole-Evans (Reynolds, 1950)  
*A. arborescens* Mill. × *A. pratensis* Baker (Glen & Hardy, 2000)  
*A. arborescens* Mill. × *A. pluridens* Haw. (Reynolds, 1950)  
*A. arborescens* Mill. × *A. sessiliflora* Pole-Evans (Reynolds, 1950)  
*A. arborescens* Mill. × *A. speciosa* Baker (Glen & Hardy, 2000)  
*A. arborescens* Mill. × *A. spectabilis* Reynolds (Reynolds, 1950)  
*A. arborescens* Mill. × *A. succotrina* Weston (Glen & Hardy, 2000)  
*A. arborescens* Mill. × *A. supraciliata* Pole-Evans (Reynolds, 1950)  
*A. arborescens* Mill. × *A. thorncroftii* Pole-Evans (Jeppe, 1974)  
*A. arborescens* Mill. × *A. thraskii* Baker (Smith & Crouch, 2009)  
*A. arborescens* Mill. × *A. verdoorniae* Reynolds (Reynolds, 1950)  
*A. arborescens* Mill. × *A. vogtsii* Reynolds (Reynolds, 1950)  
*A. arborescens* Mill. × *A. vryheidensis* Groenew. (Reynolds, 1950)

in colour (orange-red, orange to yellow) within the same population (Van Jaarsveld & Van Wyk, 2005). It is also reported to flower somewhat later, in July and August, as opposed to the usual phenology (June to July) of *A. arborescens*. However, flowering time is another variable character of the kranz aloe, with some cultivars flowering even in mid-summer (Smith & Van Wyk, 2008).

Another infraspecific entity that is often recognised is *Aloe arborescens* Mill. var. *natalensis* (J.M.Wood & M.S.Evans) A.Berger, particularly within the context of Japanese pharmacological research [see references in Smith *et al.* (2008)].

Conversely, several synonyms are recognized in the species, none of which are recognized as applying to good taxa today (Crouch *et al.*, 2008; Grace *et al.*, 2011). Furthermore, *A. mutabilis* Pillans is also seen as a synonym of *A. arborescens* by some authors (Glen & Hardy, 2000), adding to the variation included in this species concept. Initial authors [from Miller (1768) up to and

including Berger (1908)] regarded typical *A. arborescens* as a tall simple-stemmed plant and assigned varietal names to well-branched plants. However, *A. arborescens* does not occur as a solitary plant with a simple stem in its native distribution range. For this reason, varieties referring to much-branched forms [such as var. *milleri* A.Berger and var. *natalensis* (J.M.Wood & M.S.Evans) A.Berger] have been synonymised. The same goes for varieties that are clearly garden growth forms that were cultivated overseas [such as var. *pachythyrsa* A.Berger and var. *frutescens* (Salm-Dyck) Link] (Reynolds, 1950).

### Recognising variation in *Aloe arborescens*

Morphological variation such as that seen in *A. arborescens* is not uncommonly encountered in other aloes. However, this variation is, systematically, often treated differently depending on the group of aloes under consideration. Species



**Figure 10.** *A. arborescens* can form robust, thick-stemmed shrubs (cultivated). Photo: Neil R. Crouch. **Figure 11.** In certain areas *A. arborescens* grows as low bushes with fairly thin stems (Mtentu, Eastern Cape, South Africa). Photo: Neil R. Crouch. **Figure 12.** In the Western Cape, *A. arborescens* tends to grow as small straggly bushes (Tradouw Pass, Western Cape, South Africa). Photo: Arrie W. Klopper. **Figure 13.** *A. arborescens* is known to hybridise regularly with a number of other aloes. This is a natural hybrid with *A. thraskii* (Mtentu, Eastern Cape, South Africa). Photo: Neil R. Crouch.



## Box 2. Named hybrids

- A. ×caesia** Salm-Dyck in Cactalogue raisonné des et veriétés d'Aloès: 29 (1817). [*A. arborescens* Mill. × *A. ferox* Mill. (Reynolds, 1950)]
- A. ×fulgens** Tod. in Hortus Botanicus Panormitanus 2: 40 (1889). *A. salm-dyckiana* var. *fulgens* (Tod.) A. Berger in H.G.A. Engler (ed.), Das Pflanzenreich, IV, 38, III, II (Heft 33): 302 (1908). [*A. arborescens* Mill. × *A. ferox* Mill. (Reynolds, 1950)]
- A. ×heteracantha** Baker in J. Linn. Soc., Bot. 18: 161 (1880). [*A. arborescens* Mill. × *A. maculata* All. (Glen & Hardy, 2000)]  
*A. ×paradoxa* Hort. ex A. Berger in Das Pflanzenreich IV, 38, III, II (Heft 33): 217 (1908).
- A. ×inermis** Baker (nom. inval.) in J. Linn. Soc., Bot. 18: 161 (1880). [*A. arborescens* Mill. × *A. maculata* All. Considered to be a synonym of *A. heteracantha* Baker by the World Monocotyledon Checklist (Govaerts & Newton, 2012)]
- A. ×nobilis** Haw. in Synopsis plantarum succulentarum: 78 (1812). [Possible hybrid: *A. mitrififormis* Mill. × *A. arborescens* Mill. (Glen & Hardy, 2000)]  
*A. mitrififormis* Mill. var. *spinosior* Haw. in Trans. Linn. Soc., London 7: 23 (1804).
- A. ×principis** (Haw.) Stearn in Cactus Journal (Croydon) 7: 42 (1938). *Pachidendron principis* Haw., Revisions plantarum succulentarum: 37 (1821). [Natural hybrid: *A. arborescens* Mill. × *A. ferox* Mill. (Reynolds, 1950)]
- A. ×riccobonii** Borzi in Bol. Reale Ort. Bot. Palermo 2: 18–20 (1912). [Hybrid of *A. arborescens* Mill. × *A. capitata* Baker that arose in the Botanical Gardens at Palermo in Sicily (Reynolds, 1966)]
- A. ×salm-dyckiana** Schult. & Schult.f. in Systema vegetabilium 7: 710 (1829). [Natural hybrid: *A. arborescens* Mill. × *A. ferox* Mill. (Reynolds, 1950)]
- A. ×ucriae** A. Terracc. in Bol. Reale Ort. Bot. Palermo 1: 167 (1897). *A. arborescens* Mill. var. *ucriae* (A. Terracc.) A. Berger in Das Pflanzenreich IV, 38, III, II (Heft 33): 288 (1908). [Probably garden hybrid: *A. arborescens* Mill. × *A. pluridens* Haw. (Reynolds, 1950)]

concepts are applied inconsistently, with some aloes treated as variable species, whereas others are separated into infraspecific entities based on small morphological differences. A good example is the yellow forms of *A. arborescens* (Figures 14–15), which are not recognised on infraspecific level, but regarded as mere colour variants, and at times cultivars. On the other hand, *A. wickensii* Pole Evans var. *lutea* Reynolds is separated from the typical variety based on its yellow flowers and the unicoloured racemes that are slightly narrower and longer than in the typical variety (Reynolds, 1950).

One approach to recognizing the variation in *Aloe arborescens* has been through naming cultivars that display extraordinary or aberrant

characters that make such selections horticulturally desirable (Figures 16–17) (Van Jaarsveld, 2002). Description of cultivars of *A. arborescens* is ongoing with, for example, *A. arborescens* ‘Andy’s Yellow’ and *A. arborescens* ‘Andy’s Red’ having been released in 2007 and 2009, respectively (Anonymous, 2011).

Reynolds (1950) concluded that “It is much wiser to regard *Aloe arborescens* as being a variable species, than to attempt to uphold varietal names based on overseas growth forms.” We agree, and also feel that this is presently the best approach to follow for natural variation found within and between populations of *A. arborescens*. For this reason we here subsume the only subspecific entity currently recognised, *Aloe*

**Figures 14–17** (opposite). **Figure 14.** There is much variation in the yellow flowering form of *A. arborescens*. As with the other colour forms, it can develop into a large shrub or remain straggly, as the plant depicted here (cultivated). Photo: Arrie W. Klopper. **Figure 15.** Close-up of the raceme of *A. arborescens* from a large yellow-flowered shrub (cultivated). Photo: Arrie W. Klopper. **Figure 16.** This ‘regular’ and robustly shrubby form of *A. arborescens* has distinct horticultural potential. The buds are bright orange, while the open flowers have a pleasant pinkish glow (cultivated). Photo: Gideon F. Smith. **Figure 17.** This small, genetically stable form of *A. arborescens* remains stunted in cultivation. Material was originally collected by Mr Doug McMurtry at Kowyn’s Pass, Mpumalanga, South Africa, and is being propagated by Mr Sean Gildenhuis. Vegetatively these plants are consistently smaller and more slender in all respects than ‘regular’ *A. arborescens*. Inflorescences are more open and smaller, and the crimson red flowers are smaller and thinner. Photo: Gideon F. Smith.





*arborescens* subsp. *mzimnyati*, into the synonymy of *A. arborescens*, until this variable species is better understood.

### Taxonomy

*Aloe arborescens* Mill. in Gardeners' Dictionary: no. 3 (1768). *Catevala arborescens* (Mill.) Medik., *Theodora Speciosa*: 67 (1786). *Aloe perfoliata* L. *a arborescens* (Mill.) Aiton, *Hortus Kewensis*: 466 (1789). Type: South Africa, Eastern Cape, Fort Cunynghame, *E.E. Galpin* 2463 (PRE, neo.!; GRA, isoneo!). Designated by Glen & Hardy (2000: 112).

*Aloe perfoliata* L. var. *η* L., *Species Plantarum*: 320 (1753). Iconotype: *Aloe africana caulescens, foliis glaucis caulem amplectentibus*. C.Commelijn, *Horti medici Amstelaedamensis*: 27, t. 14 (1706).

*Aloe arborea* Medik. (nom. illegit.), *Botanische Beobachtungen des Jahres*: 305 (1783), based on *A. arborescens* Mill. Type: not cited.

*Aloe fruticosa* Lam., *Encyclopedie Méthodique, Botanique*: 87 (1783). Type: not cited.

*Aloe frutescens* Salm-Dyck, *Verzeichniss der Verschiedenen Arten und Abarten des Geschlechts Aloe*: 30 (1817). *Aloe arborescens* Mill. var. *frutescens* (Salm-Dyck) Link in *Enumeratio Plantarum Horti Regii Berolinensis Altera*: 339 (1821). Type: not cited.

*Aloe sigmoidea* Baker in *J. Linn. Soc., Bot.* 18: 177 (1880). Type: South Africa, Eastern Cape, Kaffraria, *T. Cooper* s.n. (K, holo!).

*Aloe natalensis* J.M.Wood & M.S.Evans in *J.M.Wood, Colonial Herbarium. Report for the year 1900*: 9 (1901). *Aloe arborescens* Mill. var. *natalensis* (J.M.Wood & M.S.Evans) A.Berger in *H.G.A. Engler, Das Pflanzenreich IV*, 38, III, II (Heft 33): 290 (1908). Type: South Africa, ex hort., Botanic Gardens, Durban, Natal, *J.M. Wood* 4342 in *NH5019* (NH, lecto!), *J.M. Wood* 4342 in *NH5020* (NH, isolecto!), *J.M. Wood* 4342 (K, isolecto!). Designated by Crouch *et al.* (2008: 71).

*Aloe arborescens* Mill. var. *milleri* A.Berger in *H.G.A. Engler, Das Pflanzenreich IV*, 38, III, II (Heft 33): 288 (1908). Type: Hort. Palermo, *Schweinfurth* s.n. (B?).

*Aloe arborescens* Mill. var. *pachythyrsa* A.Berger in *H.G.A. Engler, Das Pflanzenreich* 33: 292 (1908). Iconotype: A.Berger in *Das Pflanzenreich IV*, 38, III, II (Heft 33): 292 (1908).

*A. arborescens* Mill. var. *viridifolia* A.Berger (nom. dub.) in *H.G.A. Engler, Das Pflanzenreich IV*, 38, III, II (Heft 33): 290 (1908). Type: not cited.

*Aloe arborescens* Mill. subsp. *mzimnyati* van Jaarsv. & A.E.van Wyk, *Aloe* 42: 40–42 (2005). Type: South Africa, KwaZulu-Natal, Lower

Mzimnyati River, on cliffs above Makhwabi, *E.J. Van Jaarsveld & Xaba* 18211 (PRE, holo!).

### Conclusion

The origin and nature of the morphological variation in *A. arborescens* and how to best circumscribe it and its elements, will only be fully understood following further research. Populations across the wide distribution range of this aloe will need to be studied in considerable detail. All possible fields of evidence will have to be combined to resolve the exact nature of this variable aloe. The accelerated development of molecular techniques might in future prove very useful in delimiting infraspecific boundaries in *A. arborescens*.

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