PLATE 2323 *Aloe braamvanwykii*

Aloe braamvanwykii Asphodelaceae

South Africa

Aloe braamvanwykii *Gideon F.Sm. & Figueiredo* in Bradleya 30: 162–166 (2012); Van Wyk [B-E.] & Smith: 216–217 (2014).

Within the genus *Aloe* L. a number of groups are acknowledged as being rather challenging from a taxonomic point of view. The grass and slender aloes, *Aloe* sect. *Graminialoe* Reynolds and *Aloe* sect. *Leptoaloe* A.Berger, respectively, are two such groups (Smith 2005). However, no other infrageneric unit in *Aloe* has defied easy and accurate classification more than the maculate aloes, *Aloe* sect. *Pictae* Salm-Dyck. These aloes are generally characterised by having white or whitish H-shaped spots on one or both leaf surfaces, and their flowers have a perianth tube that is basally swollen. However, even these two characters show considerable variation. For example, *A. immaculata* Pillans includes several populations that have somewhat striated, but generally uniformly green leaves, while the flowers of *A. prinslooi* I.Verd. & D.S.Hardy are rather club-shaped and hardly swollen basally. Representatives of *Aloe* sect. *Pictae* are not the only aloes that have distinct whitish markings on their leaves. *Aloe microstigma* Salm-Dyck and *A. pictifolia* D.S.Hardy, both named for this character, as well as several other species unrelated to the maculate aloes, also have spotted leaves.

The adaptive significance of pale or dark spotted leaves, such as those of *Aloe braamvanwykii* (Figure 1), is not well understood and has been the subject of much speculation and several hypotheses (Farmer 2014). In addition to their presence in some mature aloes, spotted leaves are a common feature in the juvenile forms of numerous unrelated species of *Aloe*, such as *A. microstigma* (Figure 2). This character is thought to assist young plants to avoid herbivore attention by enabling them to better blend into seedling establishment sites in the dappled shade and protection provided by nurse plants. A further explanation for the spots on the leaves of aloes, and other alooid species, for example of *Gasteria* Duval and *Haworthia* Duval, is that they mimic damage caused by feeding insects. Such mimicry is observed across diverse plant groups, and is particularly well exemplified by *Asystasia varia* N.E.Br. (Acanthaceae), a forest understory herb from KwaZulu-Natal and the Eastern Cape. This species has irregular silvery patches along the midrib and lateral veins of leaves which strongly resemble insect leaf-mining activity. It is hypothesised that spotted leaves may serve as warning signals (albeit by deceit) to would-be leaf eaters. This possibility is based on the observation that following damage by leaf eaters, many plants respond by inducing a chemical defence in the same or other leaves (Karban 2015).

As is the case with a number of South Africa's botanists, Prof. Braam (Abraham Erasmus) van Wyk (1952–) of the Department of Plant and Soil Sciences, University of Pretoria, was also fascinated by succulents, including species of *Aloe*, as a child. He grew up on a

PLATE 2323.—1, leaf rosette, × 0.5; 2, cylindrical raceme, × 1; 3, flower development, × 1. Voucher specimen: *A.E. van Wyk 14132* in H.G.W.J. Schweickerdt Herbarium, Pretoria. Artist: Gillian Condy.

FIGURE 1.—The light green leaves of *Aloe braamvanwykii* are white-spotted in irregular bands on both upper and lower surfaces. Photographed on 4 January 2012 next to the Bloemhof road near Wolmaransstad, North-West Province, South Africa. Photograph: G.F. Smith.

farm in the North-West Province (then the Western Transvaal), South Africa, and during summer trips from the farm to the towns of Wolmaransstad and Schweizer-Reneke in North-West, he regularly noticed the flowering of a bright red form of a summer-flowering maculate aloe growing in patches along the road. Naturally this aloe became part of his succulent collection. It was the mid-1960s and literature on aloes was not readily available in the local town and school libraries. He did, however, manage to obtain a copy of *The aloes of South Africa* (Reynolds 1950) and was intrigued by the fact that no mention was made of a summer-flowering maculate aloe in that part of the country that had flowers with distinctive basal swellings in the flowers (Figure 3). The nearest record of such a species according to Reynolds's book was for *A. transvaalensis* Kuntze at Ottoshoop, quite some distance to the north. According to the available lit-

FIGURE 2.—Seedlings of *Aloe microstigma*, here growing in the extensive leaf litter of *Euclea undulata* Thunb., carry numerous small, white spots on the leaves. Photographed on 23 February 2016 north of Calitzdorp, Little Karoo, Western Cape, South Africa. Photograph: G.F. Smith.

FIGURE 3.—The red flowers of *Aloe braamvanwykii* have distinct basal swellings, unlike those of the sympatric *Aloe grandidentata*. Photographed on 5 January 2012 next to the Leeufontein road, near Wolmaransstad, North-West Province, South Africa. Photograph: G.F. Smith.

erature, the winter- to spring-flowering *A. grandidentata* Salm-Dyck (Figure 4) was the only species of maculate *Aloe* known to grow in the vicinity of Wolmaransstad and Schweizer-Reneke. In addition to its later flowering time, *A. grandidentata* is readily identified by a perianth tube that is rather weakly, but still noticeably, constricted above the base (Figure 5). Braam was familiar with the latter species as it often grows together with the summer-flowering plants, thus reinforcing his suspicion that two different species were involved.

Over a period of many years, Braam regularly mentioned this summer-flowering aloe to a number of aloe experts, and also took live plants for cultivation to the then Botanical Research Institute in Pretoria (later National Botanical Institute, now the South African National Biodiversity Institute). However, publications on *Aloe*, including the treatment of *Aloe* in the *Flora of South Africa* (Glen & Hardy 2000), still failed to account for the presence of this particular aloe in North-West. When this state of affairs was perpetuated in the first and second editions of Van Wyk [B-E.] & Smith's *Guide to the aloes of South Africa* (Van Wyk & Smith 1996, 2003), Braam again brought the existence of this particular aloe to the attention of one of us (GFS).

An opportunity finally arose for two of us (GFS and EF) to more closely examine the North-West plants just after New Year's Day in 2012. During this trip the populations, especially around Wolmaransstad, were studied in detail. This study prompted a more thorough investigation of other summer-flowering maculate aloes. It soon became apparent that the

FIGURE 4.—In general appearance, plants of *Aloe grandidentata*, which grows socially with *Aloe braamvanwykii*, resemble the latter species. Photograph: G.F. Smith.

taxon that Braam had noticed several decades ago warranted description as new. We therefore described Braam's aloe as *Aloe braamvanwykii* Gideon F.Sm. & Figueiredo (Smith et al. 2012), so honouring Prof. Van Wyk. Braam is an exceedingly productive and respected botanist who has authored or co-authored several books and many papers on aspects of the flora and natural history of southern Africa. His long-standing interest in the genus *Aloe* is exemplified, inter alia, by his co-authoring of a book on aloes in southern Africa (Smith & Van Wyk [A.E.] 2008). Over several decades Braam has been a staunch supporter of botanical art, and a regular contributing author to *Flowering Plants of Africa*, and this volume of the journal is respectfully dedicated to him.

It is tempting to regard *Aloe braamvanwykii* as simply an aberrant form of *A. transvaalensis*, a species that is rather plentiful along the Witwatersrand – Johannesburg and surrounding areas – as well as Pretoria. *Aloe braamvanwykii* is allied to other summer-flowering maculates in the *Aloe zebrina*-complex, with *A. transvaalensis* indeed probably its closest relative. It differs from *A. transvaalensis* in that plants of *A. braamvanwykii* usually form large, dense clumps (Figure 6) of rather small rosettes (up to 220 mm in diameter), as opposed to small clumps or often large, solitary rosettes (up to 400 mm in diameter). Inflorescences of *A. braamvanwykii* are short (0.65–0.75 m high) with small (20–25 mm long), unusually intense red flowers. Inflorescences of *A. transvaalensis*, on the other hand, are tall (1.0–1.5 m high) with larger (up to 36 mm long), pale flesh pink to light coral red flowers.

Aloe braamvanwykii has a rather brief and concentrated flowering period in mid-summer, from end-November to February. Plants have consistently been observed to bloom on Christmas Day (25 December) and New Year's Day. In years of extreme mid-summer drought (as has been the case in 2015/2016), many plants in a colony skip flowering. Fruit set is very quick and mature-sized green fruit are often present while flowers on an inflorescence are still opening (Figure 7). This character, however, is not unique to *A. braamvanwykii*, and has also been observed in other maculate aloes, such as *A. maculata* All. (Figure 8).

FIGURE 5.—Flowers of *Aloe grandidentata* lack prominent basal swellings. Photograph: G.F. Smith.

FIGURE 6.—Plants of *Aloe braamvanwykii* often form dense clumps consisting of scores of rosettes. Photograph: E. Figueiredo.

FIGURE 7.—In *Aloe braamvanwykii* fruit-set is very quick such that mature-sized, green fruit develop while there are still open flowers and buds on an inflorescence. Photograph: A.E. van Wyk.

Aloe braamvanwykii is only known from the Wolmaransstad, Schweizer-Reneke, Delareyville and Stella areas in the North-West Province of South Africa (Figure 9). It is found in relict stands of Klerksdorp Thornveld (Gh 13) (Mucina et al. 2006) where it grows in full sun in open grassy areas, often among woody vegetation (Figure 10). When first described in 2012, populations of *A. braamvanwykii* appeared to not have been under immediate conservation threat, even though it was noted that its area of occurrence was extensively cultivated for agricultural purposes (Van Wyk & Smith 2014). More recently the species was assessed as Endangered A2c owing to habitat loss for agricultural expansion in its habitat (Von Staden 2014). A potential future threat to the type locality, which has one of the largest known populations of the species, is the rapidly expanding township and informal settlements on the western outskirts of Wolmaransstad.

FIGURE 8.—As is the case with *Aloe braamvanwykii*, *Aloe maculata* also carries mature, bright green fruit in its clustered, head-shaped inflorescences, along with flowers that are still in bud, and at anthesis. Photograph: G.F. Smith.

When established from whole rosettes, *Aloe braamvanwykii* is easy to cultivate in open beds in the summer-rainfall region of South Africa. It prefers a well-drained, friable soil.

Type specimen examined: South Africa: North-West Province, on the farm Leeuwfontein 185, near Baskop alongside the tarred Leeufontein road, about 4 km from Wolmaransstad, 05 January 2012, *Abrie Steyn, Gideon F. Smith & Estrela Figueiredo 1* (PRE, holo.).

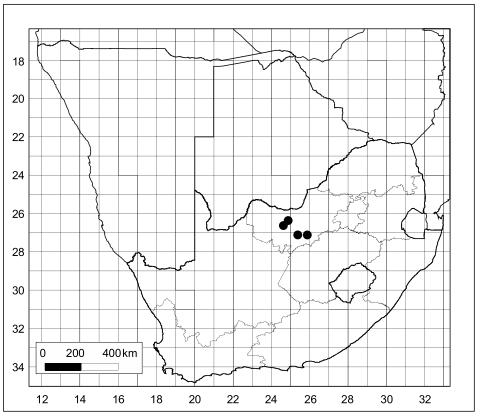

FIGURE 9.—Known geographical distribution range of *Aloe braamvanwykii* in South Africa.

Description.—Small to medium-sized, herbaceous, slow-growing, succulent, perennial, maculate aloe, total height excluding inflorescence 0.17–0.28 m, sometimes solitary, usually clumped, 5–70 heads, a single head up to (170–)220 mm in diameter. *Roots* cylindrical, 5 mm in diameter. *Stems* absent or, if rarely present, very short. *Leaves* few, 12–15, rosulate, rigidly spreading to erect, persistent when dry, dull light green to mid-green, upper surface slightly concave, hardly canaliculate, with numerous scattered white spots throughout, spots arranged in irregular transverse bands; lower surface convex, white spots more distinctly arranged in transverse bands,

FIGURE 10.—*Aloe braamvanwykii* flowering on 26 December 2015 in Klerksdorp Thornveld (Mucina et al. 2006) near Wolmaransstad, North-West Province, South Africa. Photograph: A.E. van Wyk.

sometimes confluent yielding milky green surface, texture smooth, linear-attenuate, tapering to apex, 170–260 mm long, 35–55 mm broad at base, basally sheathing; margins very thin, brown, with triangular marginal teeth, green with light brown tips, ± 4 mm long, same length throughout, evenly spaced at 10–13 mm apart; exudate pale yellowish, drying purple. *Inflorescence* 1–3, successively, 0.65–0.75 m tall, far exceeding height of rosette, central raceme longest, 5- to 7-branched from above middle, branches arcuate-erect. *Peduncle* 270–420 mm long, 8–14 mm broad at base, basally plano-convex, cylindrical above, light greenish brown with white, powdery bloom; not sterile bracteate; bracts subtending racemes narrowly triangular, 15–65 mm long, 6–8 mm broad at base, straw-coloured to light brown, papery, rarely fleshy, many nerved. *Racemes* cylindrical, 140–170 mm long, 30–50 mm wide; buds erect to suberect, flowers horizontal to drooping when mature. *Floral bracts* narrowly triangular, long attenuate, amplexicaul around pedicel, 5–9 mm long, 4–5 mm wide, straw-coloured, papery, 3- or 4-nerved. *Pedicels* 10–12 mm long, pinkish brown. *Flowers*: actinomorphic to slightly zygomorphic, unscented, nectariferous; *perianth* greenish tipped in buds, somewhat bicoloured when mature, light pink to mainly orange-red to bright red with whitish to yellowish longitudinal stripes, tip extremity purplish brown

FIGURE 11.—a, fruit capsules of *Aloe braamvanwykii*, × 1; b, habit, much reduced. Voucher specimen: *A.E. van Wyk 14132* in H.G.W.J. Schweickerdt Herbarium, Pretoria. Artist: Gillian Condy.

or whitish, lightly pruinose, 20–25 mm long, flattened at base, ± 6 mm across ovary, distinctly narrowed above ovary to ± 3 mm to form globose basal swelling, enlarging to 6–7 mm towards throat and wide open mouth, tubular-cymbiform; *outer segments* larger than inner segments, lorate, free for ± 7 mm, free portion centrally pinkish red, borders white or light yellowish, acute, segment margins straight, tips slightly recurved; *inner segments* narrower than outer, with white or yellowish border and more obtuse apex, free for upper two-thirds of their length; *stamens* with cylindrically thread-like to very slightly flattened, light yellow filaments, 25–28 mm long, all 6 of ± equal length, exserted for 2–5 mm; anthers small, 1–2 mm long, dark brown, versatile; *ovary* 5–6 mm long, 3 mm in diameter, light green; *style* as long as or slightly longer than stamens, minutely capitate, with small stigma, exserted 1–2 mm. *Fruit* an erect, bright green, cylindrical, trilocular capsule, 17–22 mm long, 9–11 mm in diameter, apically truncate, dry remains of tepals shed from around fruit early on, dehiscing loculicidally, chartaceous when dry, apically valves sigmoidally curved outwards. *Seeds* dark greyish brown, angled, laterally compressed, 2.5–3.0 mm long, with up to 1 mm wide off-white wing stretching around periphery of seed. *Chromosome number* unknown. Plate 2323; Figure 11.

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