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Aloe maculata All. (Asphodelaceae) in the Free State Province, South Africa, and resurrection of 'var. *ficksburgensis*'

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Summary: Although morphologically variable and widely distributed in southern Africa, *Aloe maculata* All. is well defined by a suite of characters that includes maculate (spotted) leaves, flat-topped inflorescences and uniformly coloured flowers. Being a predominantly mild-climate species, it rarely ventures into the more severe southern African interior escarpment, where one of its variants, var. *ficksburgensis* Reynolds – to date only validly published in combination with the name *Aloe saponaria* (Aiton) Haw. – occur. We here make the new combination at subspecific level, *A. maculata* subsp. *ficksburgensis* (Reynolds) Gideon F.Sm. & Figueiredo, and record its occurrence near Winburg in central South Africa, about 80 km west of previously known records.

Zusammenfassung: Obwohl die im südlichen Afrika weit verbreitete *Aloe maculata* All. morphologisch variabel ist, ist sie gut durch eine Kombination von Merkmalen charakterisiert, u.a. die gefleckten Blätter, die flachgipfeligen Blütenstände und die einheitlich gefärbten Blüten. Die Art ist vorwiegend in milden Klimaten heimisch und kommt nur selten bis in das innere Escarpment des südlichen Afrikas vor, wo eine ihrer Varianten, var. *ficksburgensis* Reynolds – bis heute gültig nur als Kombination mit dem Namen *Aloe saponaria* (Aiton) Haw. publiziert – zuhause ist. Wir publizieren hier die neue Kombination auf der Rangstufe der Unterart, *A. maculata* subsp. *ficksburgensis* (Reynolds) Gideon F.Sm. & Figueiredo, und berichten über ihr Vorkommen nahe Winburg im zentralen Südafrika, c. 80 km westlich der bisher bekannten Nachweise.

Introduction

Aloe maculata All. is widely distributed in southern Africa, where it is one of the most common species of *Aloe* L. Although quite variable, it is defined by a suite of morphological characters: it has maculate (spotted) leaves, inflorescences of between 0.4 m and 1.0 m tall, with flat-topped, densely capitate (head-shaped) racemes, and uniformly coloured flowers of 35–45 mm long. The species occurs from the Cape Peninsula in the Western Cape eastwards along the climatically moderate southern African coastal belt generally remaining below the Great Escarpment, to as far north and northeast as KwaZulu-Natal, Mpumalanga, Limpopo and Swaziland. However, it is unknown from adjacent Mozambique, and specimens from Zimbabwe, previously regarded as belonging to *A. maculata*, at the time as *Aloe saponaria* (Aiton) Haw., have been given recognition at the species rank as *A. collina* S.Carter (1996, 2001).

Reynolds (1937, 1950) regarded specimens of *A. maculata* from South Africa's Free State province and Lesotho as mostly, but not exclusively, belonging to the var. *ficksburgensis* Reynolds, under *A. saponaria*, the name then

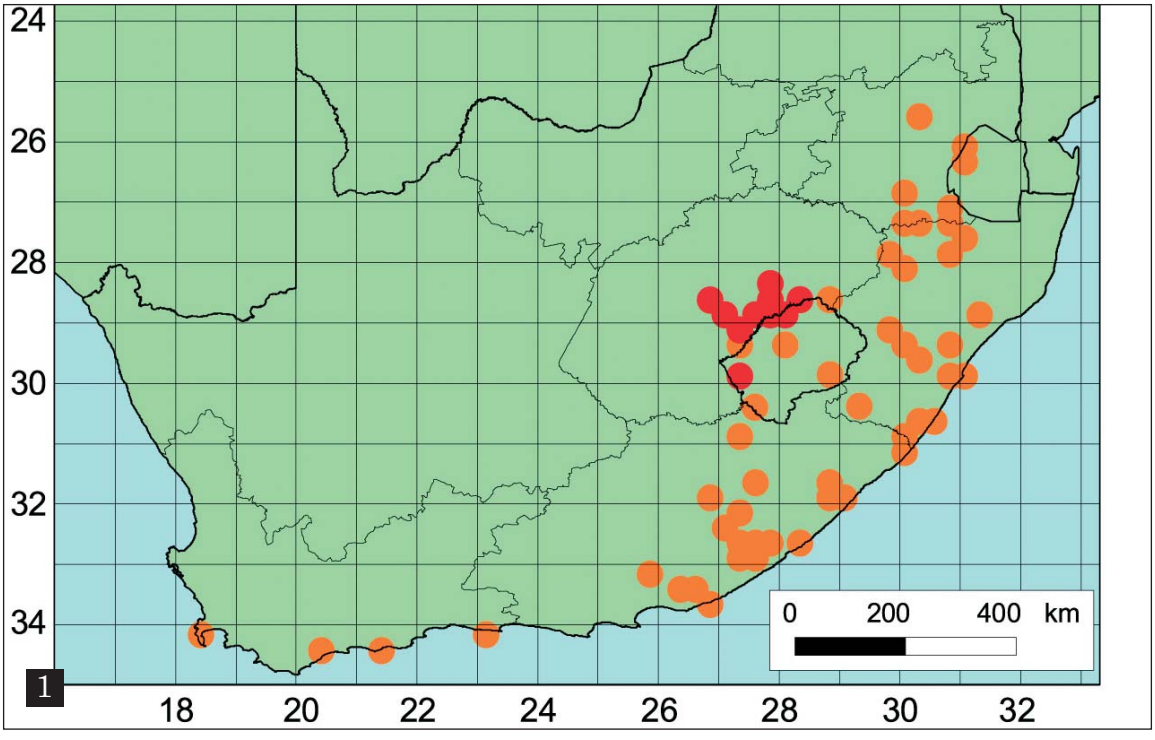

Figure 1. Known distribution of *Aloe maculata* subsp. *maculata* [orange] and *A. maculata* subsp. *ficksburgensis* [red] (based on specimens housed at PRE). **Figure 2**. Close-up of a rosette of *A. maculata* subsp. *ficksburgensis* near Winburg, central Free State. Photo: Gideon Smith.

used by him for what is today regarded as *A. maculata*. This is a distinctive form of *A. maculata* which is in most respects a smaller plant. It differs from typical *A. maculata* in the ratios of bract length:pedicel length and pedicel length: perianth length, average raceme diameters, and raceme shape.

Glen & Hardy (2000), however, regarded the var. *ficksburgensis* as a synonym of *A. maculata*, a suggestion followed by Klopper *et al*. (2009). Reynolds (1937) observed substantial variation within populations of what he described as a variety of *A. maculata*, noting that some were sufficiently distinct to suggest full species status. In the period since Reynolds made his field observations during 1935 and 1936, it has transpired that this taxon is of very limited range, growing largely allopatric with the typical variety. When this distributional character is considered together with the morphological differences (see under diagnostic characters), it is evident that this entity justifies subspecies status. Accordingly, we here resurrect the concept of var. *ficksburgensis* at subspecific level and make the new combination under *Aloe maculata*.

In their update of Harding's (1979) checklist to the aloes of the world, Richards & Ellert (1999) mention a new combination *Aloe maculata* var. *ficksburgensis* (Reynolds) Dandy and attribute this to Dandy (1970). However, Dandy (1970) did not definitely associate the epithet 'ficksburgensis' with *Aloe maculata*, but merely indicated this older name to have priority over *A. saponaria*. Furthermore, Richards & Ellert (1999) did not clearly indicate *Aloe saponaria* var. *ficksburgensis* Reynolds as the basionym, nor did they provide full and direct reference to its place of valid publication. Therefore, according to Articles 33.1 and 33.4 of the International Code of Botanical Nomenclature (McNeill *et al*., 2006) this combination was not validly published by Dandy (1970) nor by Richards & Ellert (1999), and is thus listed here as an invalid name and synonym of the new combination.

Taxonomy and nomenclature

Aloe maculata All. **subsp. ficksburgensis** (Reynolds) Gideon F.Sm. & Figueiredo **comb. et stat. nov**.

Basionym: *Aloe saponaria* (Aiton) Haw. var. *ficksburgensis* Reynolds in *J. S. Afr. Bot.* 3: 148 (1937).

Aloe maculata All. var. *ficksburgensis* (Reynolds) Dandy in Richards & Ellert: 101 (1999), *nom. inval.*

Type: Free State, northwestern slopes of sandstone hills at Molenspruit, 4 miles south of Ficksburg, 6 September 1936, *G.W. Reynolds 2087* (PRE, holo.!; BOL, iso.!).

Flowering time: August to September.

Etymology: *ficksburgensis*, for the occurrence near Ficksburg in the Free State Province, South Africa.

Aloe maculata All. in *Auctarium ad synopsin methodicam stirpium horti regii Taurinensis*: 65 (1773) subsp. ***maculata***

Lectotype: *Aloe Africana caulscens foliis spinosis maculates ab utraque parte albicantibus notates* J.Commelijn, *Horti medici Amstelaedamensis* 2: 9, t. 5 (1701) [designated by Guglielmone *et al.* (2009)]. For a complete list of synonyms see Grace *et al.* (2011).

Flowering time: varies considerably throughout its distribution range, forms flowering throughout the year, with peaks from June to September in the north of its range and December to January in the south.

Etymology: *maculata*, for the spotted leaves, from the Latin 'maculatus' (spotted).

Diagnostic characters of *Aloe maculata* subsp. *ficksburgensis*

Aloe maculata subsp. *ficksburgensis* is in most respects a smaller plant than typical *A. maculata*. Its racemes are more broadly conical or round-topped, bearing pink, yellow, orange or reddish flowers. On average, the racemes of *A. maculata* subsp. *ficksburgensis* are only 8 cm in diameter relative to those of *A. maculata* subsp. *maculata* which usually fall in the range 10–15 cm diameter. In typical *A. maculata,* floral bracts are mostly one quarter to half the length of their pedicels, whereas in the subsp. *ficksburgensis* they are as long as or slightly longer than their pedicels. The pedicels of subsp. *ficksburgensis* are shorter than those of subsp. *maculata* [25 mm against 35–50(–70) mm] which partly accounts for this discordant bract:pedicel relationship. In the typical subspecies the flowers are usually as long as or shorter than their pedicels whereas in subsp. *ficksburgensis* the flowers are always longer (Reynolds, 1937).

The inflorescence branching pattern was not highlighted by Reynolds (1937, 1950) as diagnostic. There is nonetheless a difference in this character: the inflorescences of subsp. *maculata* are usually 4–8-branched, whereas those of subsp. *ficksburgensis* tend to be simple or with up to two branches. This is a valuable additional

Figure 3. *Aloe maculata* subsp. *ficksburgensis* near Winburg, central Free State. **Figure 4**. *Aloe grandidentata* co-occurs with *A. maculata* subsp. *ficksburgensis* near Winburg, central Free State. **Figure 5**. *Aloe davyana* enters the Free State province in the north. This population was found halfway between Johannesburg and Kroonstad, near Koppies. Photos: Gideon Smith.

Table 1. Differences between the four maculate *Aloe* taxa occurring in the Free State.

Character	*A. maculata* subsp. *maculata*	*A. maculata* subsp. *ficksburgensis*	*A. grandidentata*	*A. davyana*
Inflorescence	0.4–1.0 m high, 4–8-branched from about middle	± 0.5 m high, simple or with 1–2 branches from middle or lower	± 0.9 m high, 4–7-branched above middle	0.6–1.0 m high, 3–5-branched from below middle
Raceme	capitate-corymbose, dense, 10–15 cm diam.	capitate, with rounded or broadly conical apex, dense, 8 cm diam.	cylindric, slightly acuminate, lax, 4.0–5.5 cm diam.	broadly conical, apically dense, basally laxer, 7–8 cm diam.
Flowers	usually pink to orange, sometimes yellow or red, 35–45 mm long, distinctly swollen basally, slightly decurved	usually orange or yellow, sometimes orange or reddish, 30–40 mm long, swollen basally, slightly decurved	dull red, 28–30 mm long, not or very slightly narrowed above ovary, distinctly clavate	pale pink to dull red, greenish to greyish striped, 32–35 mm long, distinctly swollen basally, slightly decurved
Floral bracts	12–23 mm long	± 25 mm long	10–15 mm long	20–25 mm long
Pedicels	35–50 mm long	± 25 mm long	10–15 mm long	20–25 mm long
Leaf (upper surface)	pale to darker green, with numerous, dull, white spots in irregular broken, wavy, transverse bands	greenish near base, brownish upwards, with numerous spots confluent in undulating, interrupted bands	brownish green, with numerous dull, white, oblong spots, usually arranged in interrupted, transverse bands	green, with numerous oblong, white spots, sometimes arranged in interrupted, wavy transverse bands
Leaf (lower surface)	paler green, obscurely lineate and usually without spots	paler green, usually without spots, sometimes with obscure immersed spots	more prominently marked	pale glaucous green, obscurely lineate, without spots
Distribution in Free State and Lesotho	northeastern Free State, Lesotho	central and eastern Free State, Lesotho	central, southern and western Free State	northern Free State
Flowering time	June–September in the north, December–January in the south	August–September	August–September	May–July

macro-morphological character to assist with delimiting the two subspecies of *A. maculata*.

Distribution range of *Aloe maculata* subsp. *ficksburgensis*

While *A. maculata* subsp. *maculata* is the most widely distributed of the maculate aloes in southern Africa, *A. maculata* subsp. *ficksburgensis* is restricted to the eastern parts of the Free State province of South Africa and the western parts of Lesotho (Figure 1). The apparent slight overlap in the general distribution ranges of the subspecies does not detract from them being distinguished at subspecific level as the two subspecies have not been recorded from the same locality.

During a recent field trip, plants of typical *A. maculata* subsp. *ficksburgensis* were recorded from near Winburg in the Free State, which is situated about 100 km northeast of Bloemfontein, the provincial capital. In all characters plants were found to coincide with those of specimens referable to the subsp. *ficksburgensis*. Furthermore, the flowers of specimens found near Winburg are a uniform, bright orange colour, with a slight waxy bloom and bracts are as long as or slightly longer than their pedicels (Figures 2 & 3). This recent collection represents a range extension of ± 80 km to the west of existing records for *A. maculata* subsp. *ficksburgensis* in the Free State (Figure 1). The climate in the central

Free State is considerably harsher than in most other parts of southern Africa where typical *A. maculata* has been recorded, especially in terms of winter minimum temperatures (Mucina & Rutherford, 2006).

In the vicinity of Winburg *A. maculata* subsp. *ficksburgensis* co-occurs with *A. grandidentata* Salm-Dyck (Figure 4), of which the distinctly clavate flowers lack the basal swelling so characteristic of the group of spotted aloes comprising Section *Pictae* Salm-Dyck. The fourth, and only other maculate aloe known from the Free State, *Aloe davyana* Schönland, is recorded only from the northern extremes of the province, and has dusty pink to reddish flowers lined with white (Figure 5) (see Table 1).

Other specimens examined for Aloe maculata *subsp*. ficksburgensis

FREE STATE.—2826 (Brandfort): About five kilometers south of Winburg, on the southern side of the road leading to the N1 highway, (–DB), in rocky grassland vegetation, 1391 m, 4 September 2009, *G.F. Smith & E. Figueiredo 16* (PRE). 2827 (Senekal): Between Paul Roux and Senekal, (–BD), 29 September 1986, *P.C. Zietsman 59* (NMB, PRE); Senekal Dist., Farm Franshoek, (–DB), 3 July 1973, *N.A. Ferreira 5* (NMB); Korannaberg, (–CC), 15 April 1987, *P.J. du Preez 687* (BLFU); Ficksburg Dist., Molenspruit, 4 miles west of Ficksburg, (–DD), 24 September 1935, *G.W. Reynolds 1573* (PRE); 6 September 1936, *G.W. Reynolds 2085 & 2086* (PRE). 2828 (Bethlehem): Clarens Dist., Clifton, (–CB), 7 September 1988, *T. Saaiman 187 & 188* (NMB, PRE). 2927 (Maseru): Ladybrand, on hills 2 miles south of Ladybrand, (–AB), 25 September 1935, *G.W. Reynolds 1575* (PRE); 2 miles south of Ladybrand in sandstone hill, (–AB), 5 August 1936, *G.W. Reynolds 2084* (PRE); 6 miles southwest of Ladybrand (–AB), 19 August 1941, *L.K.A. Chippindall 304* (PRE).

LESOTHO.—2828 (Bethlehem): Leribe, (–CC), 1913, *A. Dieterlen 337* (PRE); 3 miles south of Leribe, (–CC), 24 September 1935, *G.W. Reynolds 1574* (PRE); 8 miles northeast of Ficksburg O.F.S., east of the Caledon River, (–CC), 8 September 1936, *G.W. Reynolds 2089* (PRE). 2927 (Maseru): Likhoele, mountain slopes (–CD), October + November 1915, *A. Dieterlen 127* (PRE).

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