



Reinstatement of *Aloe mutans* (Asphodelaceae subfam. Aloioideae), a distinctive, endemic, maculate aloe from the central Limpopo province of South Africa

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Abstract

Until 1987, *Aloe mutans* (Asphodelaceae subfam. Aloioideae) was accepted as a distinctive species of maculate aloe from South Africa's Limpopo province. However, this species thereafter often has been included in the synonymy of *A. greatheadii* var. *davyana*. Recently, *A. davyana* was separated from *A. greatheadii* at the rank of species, which requires reconsideration of the taxonomic status of *A. mutans*. It is shown that *A. mutans* differs from *A. davyana* in several vegetative and reproductive morphological characters so warranting its recognition at the rank of species. *Aloe mutans* is therefore here reinstated as an accepted species. Both *A. mutans* and *A. davyana* are illustrated and an amplified description is provided for *A. mutans*.

Key words: *Aloe davyana*, *Aloe* sect. *Pictae*, northeastern South Africa, taxonomy, typification

Introduction

Both *Aloe mutans* Reynolds (1936: t. 602) (Fig. 1) and *A. davyana* Schönland (1905: 288) (Fig. 2) are included in *Aloe* Linnaeus (1753: 319) sect. *Pictae* Salm-Reifferscheidt-Dyck (1837: Sect. 23, page unnumbered) (Asphodelaceae subfam. Aloioideae), which is an infrageneric group generally referred to as the 'maculate aloes' in the vernacular (Van Wyk & Smith 2014: 208–283). First in Glen & Hardy (1987: 490–491) and 13 years later in the *Flora of Southern Africa* treatment of *Aloe* (Glen & Hardy 2000: 50–68), the maculate alooid species concept that was widely accepted for nearly 40 years following publication of Reynolds (1950) was variously amended, which resulted in the number of maculate aloes then recognised being considerably reduced. This included treating *A. davyana* as a variety of *A. greatheadii* Schönland (1904: 121), as *A. greatheadii* var. *davyana* (Schönland 1905: 288) Glen & Hardy (1987: 490), and placing, inter alia, *A. mutans* in the synonymy of the latter. *Aloe mutans* was also not upheld as an accepted species by Van Wyk & Smith (1996: 196), Van Wyk & Smith (2003: 200), Grace (2009: 115), Carter *et al.* (2011: 177), and Newton (2020: 570), but more recently Van Wyk & Smith (2014: 256–257) and Klopper (2015: 348, 602) accepted it.

It is therefore clear that the concept of *A. mutans* of Reynolds (1936) was not well established. In the first edition of the seminal work of Reynolds that appeared in 1950, a full colour photograph of the species was published as Plate 25 on the page facing p. 261. However, in the several subsequently published editions of this work, only a black-and-white illustration of a floral series (bud to early fruit) of the species was included. This likely contributed to the species remaining little-known.

Aloe davyana, as well as several of the other maculate aloes placed in the synonymy of *Aloe greatheadii* var. *davyana* by Glen & Hardy (1987, 2000), have recently been reinstated at species level (see Klopper *et al.* 2011, 2014, Smith *et al.* 2020, 2021, Smith & Klopper 2021, 2022, Smith & Figueiredo 2023). This necessitates a formal reconsideration of the taxonomic status of *A. mutans*.

Following recent fieldwork across much of the natural geographical distribution range of *A. davyana* in north-central South Africa, and that of *A. mutans* in the central Limpopo province in the northeast of the country, the taxonomic status of *A. mutans* was reassessed. We here reinstate *A. mutans*. Both *A. mutans* and *A. davyana* are illustrated and an amplified description is provided for *A. mutans*.

Material and Methods

The description of *A. mutans* is based on detailed, comparative morphological studies of material of this species in the veld in the Limpopo province of South Africa, and of *A. davyana* as found in South Africa's Gauteng and adjacent provinces. Measurements were taken by hand using a ruler, except for floral measurements below 4 mm, which were taken using hand-held magnifying equipment.

The description of *A. mutans* follows the Aloes of the World descriptive template (see Smith *et al.* 2008a, b and Klopper *et al.* 2010, 2013).

Throughout this paper, '*A. davyana*' refers to the autonymic variety only, because *A. davyana* var. *subolifera* Groenewald (1939: t. 732) (see Smith *et al.* 2021: 210) and *A. davyana* var. *magdae* Smith (2022: 266) have considerably more westerly and southwesterly natural geographical distribution ranges, respectively, than *A. mutans*. Morphologically, these two varieties differ from autonymic *A. davyana*, and significantly so from *A. mutans* (see Smith *et al.* 2021: 210 and Smith 2022: 266).

Unless more up-to-date information is available, author attributions of scientific plant names cited follow IPNI (2023+), albeit in the notation required by *Phytotaxa*, i.e., by citing the protologues of the names as full bibliographic references.

Herbarium codes follow Thiers (2023 [continuously updated]).

Nomenclatural issues accord with the Shenzhen *Code* (Turland *et al.* 2018).

Place and river names are standardised on Raper *et al.* (2014).

Results

Differences between *A. mutans* and *A. davyana* are summarised in Table 1. *Aloe mutans* can form clumps of up to 14 rosettes, while *A. davyana* generally have two to four rosettes in a clump (Figs 2, 4A, and 4C). However, both species can also be found as solitary specimens (see Figs 1 and 3A for *A. mutans*). The adaxial leaf surface of both species is copiously spotted with \pm H-shaped whitish maculations (Figs 1 and 2) and the abaxial leaf surface is light green to greyish green. However, the adaxial leaf surface of *A. mutans* is brownish to yellowish green (Figs 3A and 3D), while that of *A. davyana* is dark brownish green.

TABLE 1. Characters according to which *Aloe mutans* can be separated from *A. davyana* [var. *davyana*].

#	Character	<i>A. mutans</i>	<i>A. davyana</i> [var. <i>davyana</i>]
A. Vegetative			
1.	Growth form	Rosettes solitary or suckering to form groups of 10(–14)	Rosettes solitary or sometimes suckering to form groups of 2–4
2.	Leaf length (cm)	10–20	Up to 30
3.	Leaf colour (adaxial)	Brownish to yellowish green	Dark brownish green
B. Reproductive			
4.	Pedicle length (mm)	14–16	20–25
5.	Basal swelling of flower	Abrupt; slightly flattened above	Gradual; rounded above
6.	Raceme dimensions (cm)	15–30 \times 7–8	15–20 \times 7–8
7.	Floral density	Rather sparsely flowered	Subdense to dense
8.	Flower colour	Apical $\frac{1}{3}$ to $\frac{1}{2}$ yellow, transitioning through orange to strawberry pink basally	Uniformly pale flesh-pink to dull brick-red

The branches of the inflorescences of *A. mutans* diverge from the vertical, i.e., from the peduncle, at an angle of $\pm 45^\circ$, while those of *A. davyana* diverge at a narrower angle.

Floral characters are the most obvious ones according to which *A. mutans* can be separated from *A. davyana*. The swollen base of the flowers of *A. mutans* is longitudinally somewhat compressed so giving the impression of it being slightly flattened above (Fig. 3F), whereas that of *A. davyana* is more gradually rounded above (Fig. 4D). This results in the basal swelling of the flowers of *A. mutans* appearing more prominent than that of *A. davyana*.

In the case of *A. mutans*, the flowers are yellow in the apical $\frac{1}{3}$ to $\frac{1}{2}$, which transitions through orange to strawberry pink at the base—this transition in flower colour is the character for which the species was named [from Latin ‘mutatio’ = change (Grace *et al.* 2011)] (Fig. 3F). In contrast, the flowers of *A. davyana* are pale flesh-pink to dull brick-red throughout (Figs 4B–D), with the tips sometimes slightly duller than the rest of the perianth (Fig. 4D).

Nomenclature of *Aloe mutans*

Aloe mutans Reynolds (1936: t. 602) (Figs 1 and 3).

Also treated in: Groenewald (1941: 85, 105, 117, 135), Reynolds (1950: 261), Judd (1967: 55, plate 14, top, second from the left), Jeppe (1969: 91, plate on following, unnumbered page), Bornman & Hardy (1971: 122–123), Jacobsen (1977: 90), Jacobsen (1986: 182), Grace *et al.* (2011: 107), Van Wyk & Smith (2014: 256–257), and Klopper (2015: 348, 602).

Type:—SOUTH AFRICA. Limpopo province. Pietersburg [Polokwane] district, Boschplaats, [Mphathleles Location, 20 miles [32 km] south of Chunies Poort [Chuenespoort], fl. 11] August 1935, *G.W. Reynolds 1527*, “and in *Nat. Herb.* 20215” (holotype, PRE barcodes PRE0086199-1! and PRE0086199-2! [2 sheet gathering]; isotypes PRE [3 sheets, but not labelled “20215” as in the holotype], BOL barcodes BOL140154!, BOL140155!, and BOL140156!, K barcodes K000256634! and K000256635!, SRGH barcode SRGH0106230-0!, W barcode W19610000092!).

Notes on the typification of the name *Aloe mutans*:—Reynolds (1936: t. 602) indicated the type of the name *A. mutans* as “TRANSVAAL: Pietersburg distr.; Boschplaats, Aug. 1935, *Reynolds 1527* (typus), and in *Nat. Herb.* 20215”. Crucially, the number ‘20215’, which refers to the PRE accession number given to this gathering, was unambiguously mentioned in the protologue (Reynolds 1936: first text page accompanying plate 602). This particular *G.W. Reynolds 1527* specimen is the only one mentioned and can be regarded as the holotype, following Turland *et al.* (2018: Art. 9.1). This was also the only specimen later mentioned in Reynolds (1950: 261), albeit with additional locality detail, thus providing additional evidence that its status is that of holotype. The holotype consists of two sheets, indicated as ‘Sheet I’ and ‘Sheet II’ written in pen on the mounting boards (available online at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.pre0086199-1> and <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.pre0086199-2>). Duplicates of this collection were cited from Herbs. BOL and SRGH in Glen & Hardy (2000) and further duplicates are known from Herbs. K and W (JSTOR Global Plants 2023).

The three duplicates of *G.W. Reynolds 1527* in Herb. BOL are treated as three specimens, since they were not accessioned as sheets of the same collection. All three have a label affixed that reads ‘Type No.’ and all three specimens bear the date ‘10 Aug 1935’. The holotype and protologue (Reynolds 1936: t. 602) only cite ‘Aug 1935’ as the date of collecting, but Reynolds (1950: 261) indicates that the material flowered on 11 August 1935. Two of the specimens (BOL140154 and BOL140155; available online at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.bol140154> and <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.bol140155>) have the locality ‘Boschplaats, Transvaal’, while the third cites the locality as “Boschplaats, 14 m. [miles] S [south] of Chunes Poort [Chuenespoort] Police Post, – 7 m. [miles] N [north] of Olifants River Bridge” (BOL140156; available online at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.bol140156>). Reynolds (1950: 261) indicates the type locality as “North-eastern Transvaal: Pietersburg Dist. [Polokwane]: Boschplaats, Mphathleles Location, 20 miles south of Chunies Poort [Chuenespoort]”, while the protologue only mentions “TRANSVAAL: Pietersburg distr.; Boschplaats” in the type citation and further on in the text it is stated that the material was collected “at Boschplaats, Mphathlele’s Location, 42 miles south of Pietersburg [Polokwane] in the northern Transvaal [now the Limpopo province of South Africa]” (Reynolds 1936: t. 602). Despite these minor discrepancies, the Herb. BOL duplicates are here regarded as isotypes.

The two duplicates at Herb. K were also not accessioned or indicated to be sheets of the same collection and are regarded as two specimens (K000256634 and K000256635; available online at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.k000256634> and at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.k000256635>). Both contain a similar Herb. PRE label with the date “10-8-35” and the locality “Boschplaats, 19½ miles S [south] of Chuenespoort [Chuenespoort] + 7 m. [miles] N [north] of Olifants River Bridge”. The PRE accession

number (20215) linked to the holotype is not present on these specimens. There is no indication of type status on the Herb. K specimens. The Herbs. SRGH and W duplicates have similar labels to those of the Herb. K specimens with corresponding information, and also lack the PRE accession number (20215). The Herb. SRGH duplicate further bears a label stating “ISOTYPUS” (SRGH0106230-0; available online at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.srgh0106230-0>), while the Herb. W duplicate bears a 2005 determinavit slip by H. Rainer with “TYPUS” added in red ink (W1961000092; available online at <https://plants.jstor.org/stable/viewer/10.5555/al.ap.specimen.w1961000092>). These are all considered to be isotypes.



FIGURE 1. Three solitary specimens of *Aloe mutans* growing between Morotse and Malekapane in South Africa’s Limpopo province. Usually only a single, 3- or 4- to 7-branched panicle is produced per rosette per season. Photographer: Gideon F. Smith.



FIGURE 2. A two-headed specimen of a form of *Aloe davyana* [var. *davyana*] with pale flesh-pink, greenish to greyish white-striped flowers. Photograph taken between Donkerhoek and Pretoria, Gauteng province, South Africa, by Gideon F. Smith. Note that each rosette has produced two inflorescences.



FIGURE 3. *Aloe mutans* growing near Morotse in South Africa's Limpopo province. **A.** A solitary specimen. **B.** A two-headed specimen showing the brownish to yellowish green adaxial leaf surface. **C.** Solitary and multi-headed specimens, some of which are in flower while others are already in fruit. **D.** The leaf sap dries dark purplish. Abaxially the leaves are uniformly light green to greyish green; longitudinally indistinctly dark green-lined; and sometimes obscurely white-spotted, as here. **E.** Plants often grow in the shade of low-growing shrubs and small trees that act as nurse plants with only the inflorescences protruding above the shrub layer. **F.** The apical $\frac{1}{3}$ to $\frac{1}{2}$ of the perianth is yellow, which transitions through orange to strawberry pink basally. The basal swelling of the flowers is longitudinally more abruptly flattened than in *A. davyana*. All photographs by Gideon F. Smith.

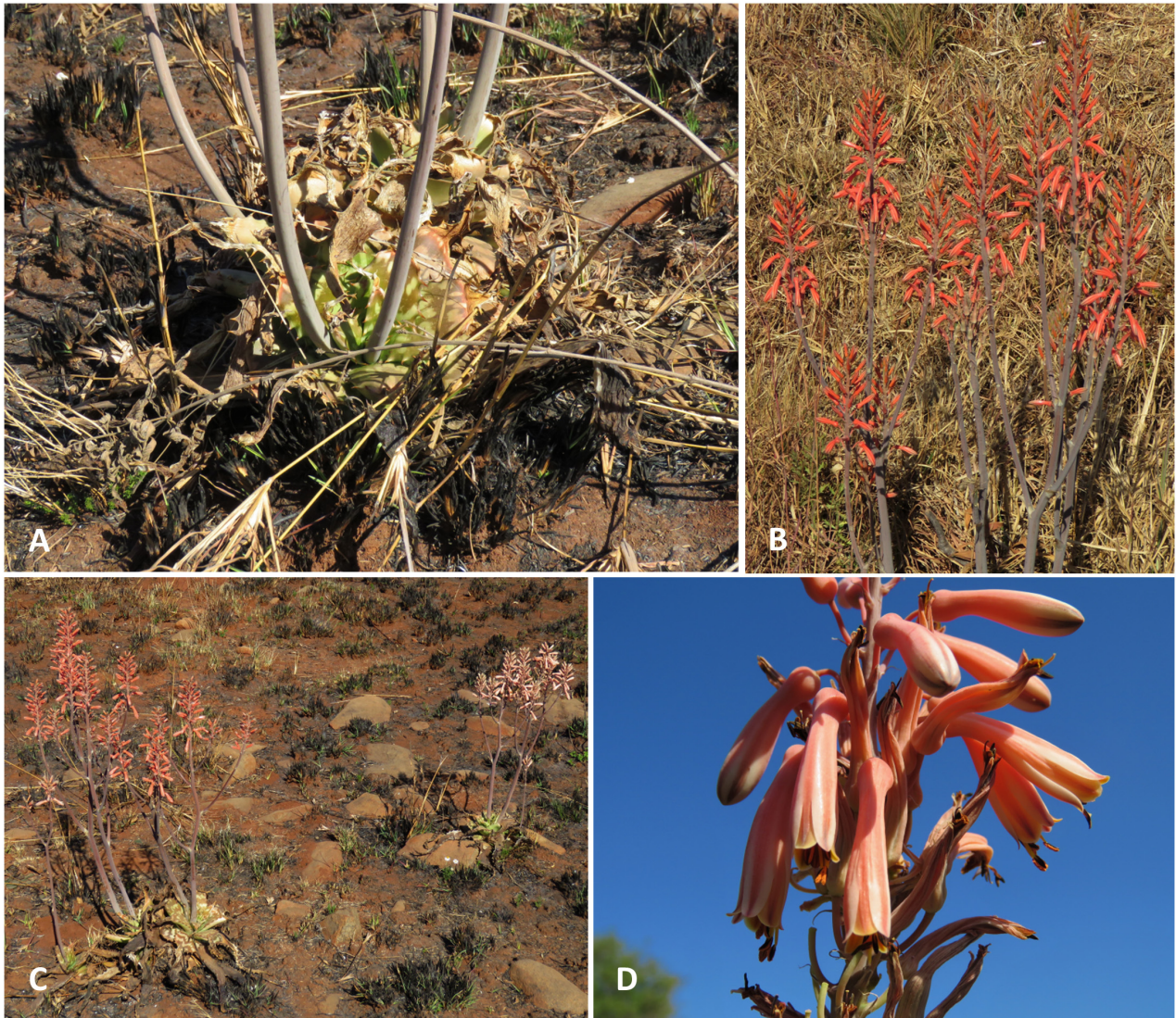


FIGURE 4. *Aloe davyana* growing near Pretoria, Gauteng province, South Africa. **A.** A three-headed specimen, with each rosette simultaneously producing two inflorescences. **B.** A form with uniformly dull brick-red flowers. **C.** Two flower colour forms (dull brick-red on the left and pale flesh-pink on the right) growing in close proximity. **D.** The flowers are uniformly chromatic, not multi-coloured as in *A. mutans*. All photographs by Gideon F. Smith.

In addition, a further duplicate of the type (consisting of three sheets) is also present at Herb. PRE. This specimen has the same label information as the duplicates held at Herbs. K, SRGH, and W but, importantly, lack the uniquely defining Herb. PRE accession number, “20215”, that Reynolds (1936: t. 602) cited in the protologue. This particular specimen contains a note in the handwriting of Reynolds that indicates that this three-sheet gathering was deposited together with the holotype material, but with an instruction to the herbarium curator that the holotype material was wrapped separately from it. The somewhat illegible text, written vertically on the note that is attached to the *G.W. Reynolds 1527* isotype (i.e., not the holotype qualified by “20215”) reads: “What [I would?] like[?] as the type please is wrapped up separately”.

Description:—Plants small, low-growing, solitary or forming clumps of up to 10(–14) rosettes, rosette erect, up to (15–)20 cm tall. *Stem* ± absent, short, simple or once-branched, thickened lower down if present, clothed in persistent, twisted, dried leaves. *Leaves* densely rosulate, at first erect, then horizontally spreading, 10–20 cm long, 5–7(–8) cm wide at base, brownish to yellowish green, deltoid-lanceolate, abaxially uniformly light green to greyish green, longitudinally indistinctly dark green-lined, lines narrow, not confluent, sometimes obscurely white-spotted, adaxially usually densely white-spotted, white spots ± H-shaped-oblong, in interrupted, wavy transverse bands or haphazardly arranged, rarely confluent to yield green-striped appearance, texture smooth; *margins* shiny-dark brown especially abaxially, sometimes concolorous, armed with short, prominent, very pungent, deltoid, shiny-brown, dark orange-

tipped teeth, $\pm 4\text{--}5\text{--}(6)$ mm long, $5\text{--}7\text{--}(8)$ mm apart, straight or more rarely variously curved towards leaf base; *leaf sap* drying dark purplish. *Inflorescence* a 3- or 4- to 7-branched panicle, usually one produced per season, $(0.5\text{--})0.6\text{--}0.9\text{--}(1.2)$ m tall, erect, branched below or at middle, branches erect at $\pm 45^\circ$ from peduncle, terminal raceme longer than others; *peduncle* rather stout, lacking sterile bracts below racemes, panicle branches subtended by prominent, rapidly-drying fertile bracts of $\pm 15\text{--}30$ mm long; *peduncular bracts* creamy white, irregularly lanceolate-triangular, longitudinally brownish-lined. *Racemes* cylindrical-acuminate, rather narrow, very gradually tapering upwards, $15\text{--}30$ cm long, $7\text{--}8$ cm wide where flowers are at anthesis, sparsely flowered; *buds* erect to erectly spreading. *Floral bracts* $10\text{--}22\text{--}(30)$ mm long, whitish grey, many-nerved, not prominent, as long as or slightly longer than pedicels, drying rapidly, narrowly lanceolate, variously twisted, much narrower than fertile bracts. *Pedicels* $14\text{--}16$ mm long, light pinkish when young, dark pinkish with age, sometimes lengthening when in fruit. *Flowers* pendulous at anthesis; *perianth*: covered in a bloom, buds strawberry pink, with alternating light greenish and white longitudinal stripes; open flowers copiously nectariferous, apical $\frac{1}{3}$ to $\frac{1}{2}$ yellow, transitioning through orange to basally strawberry pink, longitudinally white-striped, $(28\text{--})32\text{--}(33)$ mm long, $6\text{--}7\text{--}(8)$ mm across ovary, narrowed above ovary to yield distinct bulbous base, distinctly enlarged towards mouth from below middle, then constricted towards mouth; tips of segments very slightly flared, outer segments free for $\pm \frac{1}{3}$ of their length; *stamens* with filiform-flattened filaments, uniformly light yellowish green, hardly exerted, visible at mouth; *ovary* $6\text{--}7$ mm long, $2\text{--}4$ mm in diam., mid-green, distinctly grooved; *style* included to hardly exerted, uniformly light yellow; *stigma* tiny, very slightly capitate, same colour as style. *Fruit* a loculicidal capsule, $25\text{--}(28) \times 14\text{--}16$ mm, light green turning light brown-purplish with age, dry remains of perianth variously persistent. *Seed* not seen. *Chromosome number*: unknown.

Distribution:—*Aloe mutans* essentially occurs in the northern parts of the Springbokvlakte of the Limpopo province (note that there are several locations in South Africa with the name ‘Springbokvlakte’, see Leistner & Morris 1976: 467–468), where it is a component of *Combretum-Acacia* veld (Fig. 5). Plants grow in open places among rocks or, often, in the shade of low-growing shrubs and small trees that act as nurse plants.

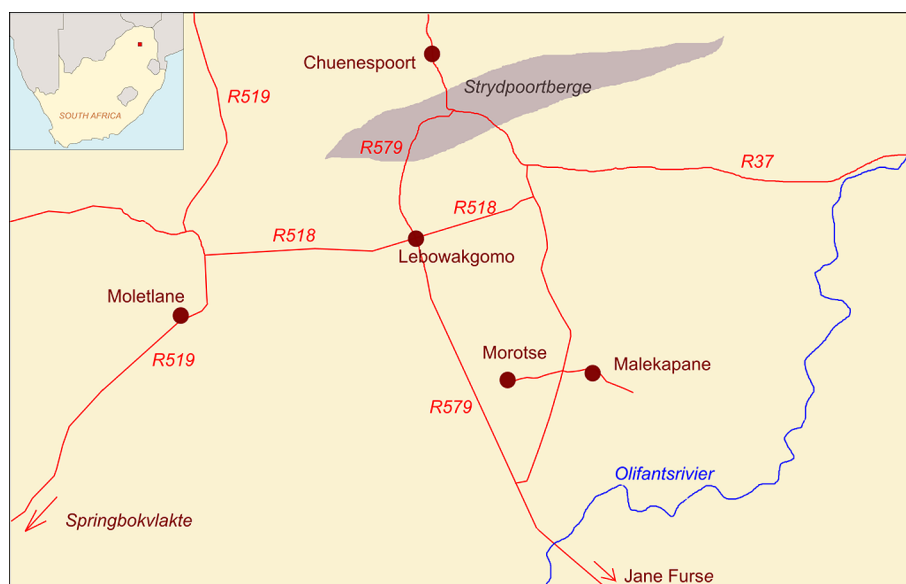


FIGURE 5. Map of where *Aloe mutans* occurs. The Strydpoortberge are shaded in grey. *Aloe mutans* grows south and southwest of Morotse and Malekapane, in the Springbokvlakte in South Africa’s Limpopo province. Main roads are shown in red and rivers in blue.

Aloe mutans is reasonably common around Morotse and Malekapane south of Lebowakgomo, and further south towards Jane Furse (Fig. 5). The area is subject to extensive urban development.

Additional specimen investigated:—SOUTH AFRICA. Limpopo. Adriaansdraai, F.Z. van der Merwe 75 (PRE).

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