

Aloe kaokoensis Van Jaarsv., Swanepoel & A.E. van Wyk, a new species allied to *A. littoralis* Baker, is described from the Otjihipa Mountains, Kaokoveld, northwestern Namibia. It is one of 28 currently recognized species of *Aloe* L. in Namibia (Rothmann 2004). Nine of them have been recorded in the Kaokoveld. This is the second new species recently described from the Kaokoveld, an indication of the poor state of botanical exploration in this arid, mountainous region. The first, *Aloe omavandae* Van Jaarsv. & A.E. van Wyk, was described from the cliff faces of the eastern Baynes Mountains (Van Jaarsveld & Van Wyk 2004; Van Jaarsveld *et al.* 2005).

Aloe kaokoensis Van Jaarsv., Swanepoel & A.E. van Wyk, sp. nov., *A. littoralis* affinis, sed caulibus senectis decumbentibus, foliis dense rosulatis laete glaucis cum dentibus nigris sursum spectantibus, perianthio 35 mm longo differt.

TYPE.—Namibia, 1712 (Swartbooisdrif): Kaokoveld, Otjihipa Mountains, ± 5 km ESE of Otjinhungwa growing on rocky outcrops, 1 000 m, (–BC), *Van Jaarsveld & Swanepoel 19504* (WIND, holo.).

Plants solitary, rosulate, up to 0.73 m tall and 1.3 m diam., shortly caulescent; stem up to 1 m long and 100 mm in diam., erect when young, becoming decumbent with age, covered with remains of old dry leaves; bark grey. *Roots* grey, 3–4 mm thick. *Juvenile leaves* distichous at first, lorate-triangular and biconvex, both surfaces distinctly spotted, some spots with short spines; apex mucronate. *Mature leaves* 35–40, in a dense rosette,

arcuate-ascending, lower leaves spreading, tough, with asymmetric keel near apex, triangular-lanceolate, 380–670 × 70–140 mm; upper surface flat, but becoming channelled in upper half, pale glaucous, slightly rough to touch, sparsely white-spotted in basal third, occasionally without spots, with lenticular spots irregularly arranged; lower surface flat to slightly convex at first, becoming convex, copiously white-spotted, with lenticular spots arranged in obscure white bands; margin yellowish green, cartilaginous, translucent, armed with deltoid-acuminate, small, black (yellowish to reddish brown at first) teeth 3–4 × 4–5 mm, 7–15 mm apart (8–9 mm apart near apex), projecting towards apex; apex acute, ending in 1–3 teeth. *Leaf sap* copious, yellowish, drying honey-coloured to dark brown to black. *Inflorescence*: 1 or 2 per plant, a much-branched panicle, 1.23–1.42 × 0.6–0.85(–1.12) m, bearing many lateral branches in upper half; peduncle biconvex, grey-green, up to 40 mm diam. at base and unbranched for up to 220 mm, with powdery bloom, flattened and marginiform (bearing an acute margin opposite to each other) at base for 150–200 mm; racemes cylindrical-acuminate, 330–470 × 700 mm; flowers laxly arranged; pedicels 11(–14) mm long; bracts ascending, navicular, linear-lanceolate, 10–12 × 3 mm, channelled, acuminate, whitish, thin, scarious. *Perianth* orange-red becoming slightly yellowish when open, cylindrical-trigonal, 35 × 6.0–6.5 mm, rounded at base; outer segments free to halfway down; inner segments free but dorsally adnate to outer over basal half; apices acute to subacute. *Stamens* included but sometimes shortly exerted; anthers oblong, 3 × 1 mm; filaments filiform-flattened, pale yellow, inner 3 narrower and slightly longer; pollen orange.

Ovary green, cylindrical, 6-grooved, $8 \times 2-3$ mm; *style* 25 mm long, shortly exerted (sometimes up to 7 mm); *stigma* capitate. *Capsule* cylindrical-triangular, erect, $20-26 \times 8-11$ mm. *Seed* 3×2 mm, angular, winged, grey-black. Figure 11.

Aloe kaokoensis is distinguished by its large, solitary rosettes (up to 1.3 m in diameter) of pale, glaucous leaves with black teeth, of which the apices project towards the leaf apex, and large dense panicles (young erect plant depicted in Figure 11) and stems that are invariably decumbent in old plants. It is clearly related to *Aloe littoralis* in its floral features. *A. littoralis* is found throughout Namibia in suitable habitats and also occurs in Angola, Zimbabwe, Mozambique and Botswana. *A. littoralis* always has an erect stem up to 3 m tall and greyish green leaves that are mottled or spotted when young, but usually without spots in adult plants. Furthermore, the leaves have brown to reddish brown teeth. The perianth of *A. kaokoensis* is 35 mm long, thus slightly longer than in *A. littoralis* (23–34) (Reynolds 1974). *A. kaokoensis* contains copious quantities of yellow leaf sap, which turns honey-coloured to dark brown when exposed to air. Its

large, branched, paniculate inflorescence bears ascending racemes of orange-red flowers, 35 mm long. *A. kaokoensis* may also be confused with two other aloes with pale glaucous leaves (Table 1). The first, *A. namibensis* Giess, is a much smaller species occurring to the south and its flowers are coral-pink. The second, *A. dewinteri* Giess, is a cliff dweller from the Sesfontein region, bearing coral-pink flowers that turn white when fully open.

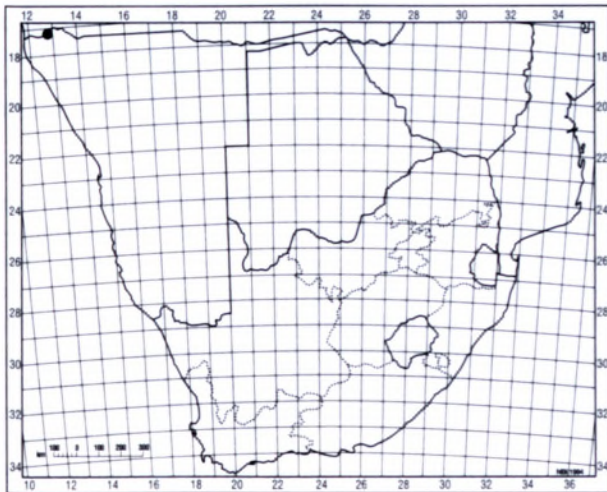
Aloe kaokoensis grows at altitudes of 700 to almost 2 000 m on the northwestern extreme of the granitic Otjihipa Mountains (eastern margin of the Marienfluss) (Figure 12). The plants are sometimes locally abundant where they grow in granitic soil and quartz fragments, usually in full sun. *A. kaokoensis* is a constituent of arid *Colophospermum mopane* (mopane) woodland, with several species of *Commiphora* prominent, for example, *Commiphora glaucescens*, *C. multijuga*, *C. tenuipetiolata*, *C. virgata* and *C. wildii*. Other associated species include *Adenium boehmianum*, *Aloe dinteri*, *Boschia tomentosa*, *Ceraria longipedunculata*, *C. carrissoana*, *Euphorbia guerichiana*, *E. monteiroi*, *E. virosa*, *Ledebouria* sp., *Lycium* sp., *Rhigozum virgatum*, *Sterculia africana*, *S.*



FIGURE 11.—*Aloe kaokoensis*. A, young adult plant (stem not yet decumbent) with inflorescence, $\times 0.08$; B, mature and juvenile leaf apex, $\times 0.8$; C, raceme, showing flowers, $\times 0.6$; D, infructescence showing capsules, $\times 0.6$. Artist: Lisa Strachan.

TABLE 1.—Main differences between *Aloe kaokoensis*, *A. dewinteri*, *A. namibensis* and *A. littoralis*

	<i>A. kaokoensis</i>	<i>A. dewinteri</i>	<i>A. namibensis</i>	<i>A. littoralis</i>
Habit	solitary, stem short, decumbent	solitary, stemless, rarely with short stem, decumbent	solitary, stemless, erect	solitary, erect stem up to 3 m tall
Leaf				
colour	pale glaucous, spotted when young, faintly spotted or not spotted	grey-green with slight powdery bloom, not spotted	glaucous, not spotted	grey-green, spotted when young, non spotted or sometimes spotted when mature
surface	slightly rough to touch (when mature)	smooth to touch	slightly rough to touch	smooth to touch
margin	yellowish to reddish brown teeth turning black	brown, deltoid teeth	brown, triangular teeth	brown to reddish brown teeth
sap	drying honey-coloured, dark brown to black	drying honey-coloured, dark brown	drying light yellow to honey-coloured	drying reddish-brown
Perianth	35 mm long, orange-red, slightly yellowish at mouth	30–33, coral-pink, at maturity turning white or yellowish	30 mm, coral-pink	23–34 mm, dull rose-red to bright red, turning yellowish at mouth

FIGURE 12.—Known geographical range of *Aloe kaokoensis*.

quinqueloba and a *Polygala* sp. The discovery of *Aloe kaokoensis* brings to four the number of *Aloe* species endemic or largely confined to the Kaokoveld Centre of Endemism (Van Wyk & Smith 2001), the others being *A. corallina* I. Verd., *A. dewinteri* and *A. omavandae*.

The flowering time of *A. kaokoensis* ranges from March to May. Dusky sunbirds (*Nectarinia fusca*) have been observed visiting the plants, and appear to be the main pollinators. Average annual rainfall in the Kaokoveld varies from less than 50 mm along the coast to ± 350 mm in the highlands (Mendelsohn *et al.* 2002). Rainfall is erratic and occurs mainly in the form of thundershowers in summer. On the Otjihipa Mountains where the new species is found, the average annual rainfall is estimated at ± 150 –200 mm. The coastal mountains are also subject to fog from the Atlantic Ocean (60 km from the Otjihipa Mountains).

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