Flowering Plants of Africa

Volume 63

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Flowering Plants of Africa

Since its inception in 1921, this serial, modelled on the former *Curtis's Botanical Magazine*, has published well over 2 000 colour plates of African plants prepared by some 80 artists.

The object of the serial is to convey to the reader the beauty and variety of form of the African flora, to stimulate an interest in the study, conservation and cultivation of African plants and to advance the science of botany as well as botanical art.

The illustrations are mostly prepared by artists on the staff of the South African National Biodiversity Institute, but we welcome other contributions of suitable artistic and scientific merit. Please see *Guide for authors and artists* on page 145.

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History of this series
(note Afrikaans translation and changes in title)

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Volume 25 (1945–1946) to Volume 26 (1947):
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Cover illustration: *Erica verticillata* (Plate 2296)

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Flowering Plants of Africa

A magazine containing colour plates with descriptions of flowering plants of Africa and neighbouring islands

Edited by

A. Grobler

with assistance of

G.S. Condy

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Aloe mitriformis subsp. *comptonii* Asphodelaceae

South Africa

Aloe mitriformis subsp. **comptonii** *(Reynolds) Zonneveld* in *Bradleya* 20: 10 (2002).

Aloe comptonii Reynolds was first named in *The Aloes of South Africa* (1950), with the description based on plants collected by Dr. G.W. Reynolds at Uniondale (Western Cape). However, this taxon was recently subsumed under *A. mitriformis* following genome studies by Zonneveld (2002). *Aloe mitriformis* subsp. *comptonii* belongs to *Aloe* (Section *Aloe*) Series *Aloe* (Glen & Hardy 2000 [following Reynolds 1950, Series *Mitriformes* (Salm-Dyck) Reynolds]), which is centred mainly in the southern and south-western parts of South Africa, an area that receives most of its rainfall during winter. Members of Section *Aloe* Series *Aloe* are easily recognised by their characteristic persistent firm ovate-acute green to glaucous, succulent leaves with white or yellowish marginal teeth and distinct capitate racemes. The plants are usually branched with short to long leafy, procumbent, decumbent, erect or pendent stems. Eight taxa are classified under Section *Aloe* Series *Aloe*, namely *Aloe arenicola* Reynolds, *A. mitriformis* subsp. *comptonii* (Reynolds) Zonneveld, *A. mitriformis* subsp. *distans* (Haw.) Zonneveld, *A. mitriformis* Mill. subsp. *mitriformis*, *A. dabenorisana* Van Jaarsv., *A. meyeri* Van Jaarsv., *A. pavelkae* Van Jaarsv., Swanepoel, Van Wyk & Lavranos, and *Aloe pearsonii* Schönland. Of all these taxa, *A. mitriformis* is the most variable and widespread in South Africa's winter rainfall region. Plants vary in habit (procumbent to decumbent), leaf size, leaf colour, as well as leaf margin prickle colour (yellow to white). These variations, however discrete, prompted Zonneveld to reduce both *A. comptonii* Reynolds and *A. distans* Haw. to subspecific level (Zonneveld 2002; Carter *et al.* 2011).

Glen & Hardy (2000) treated *Aloe comptonii* as a synonym of *A. perfoliata* without justifying this action. In spite of a floral specimen by Linnaeus, Reynolds (1950) was unable to determine the identity of *A. perfoliata*. This specimen (with short pedicels) does not match the distinct capitate raceme and long pedicels, which is characteristic of *A. mitriformis*, with Reynolds concluding and treating *A. perfoliata* as an imperfectly known taxon. Therefore the name *A. mitriformis* Miller takes priority based on the figure (iconotype) in Dillenius's *Hortus Elthamensis* 21, tab. 17, fig. 19 in 1732 (Carter *et al*. 2011).

Aloe mitriformis subsp. *comptonii* is characterised by its short decumbent stems, bearing ascending to erect rosettes and paniculate inflorescences consisting of up to eight distinctly rounded to pointed, capitate racemes. Flowering time is during spring and early summer (September–December). Its closest relative (subsp. *mitriformis*) has long procumbent stems (sometimes pendent from cliffs), leaves somewhat less glaucous and flowering during summer.

PLATE 2282.—1, flowering raceme, × 1; 2, decumbent stem with erect rosette, much reduced. Voucher specimen: *Van Jaarsveld 19527* in Compton Herbarium, Kirstenbosch. Artist: Gillian Condy.

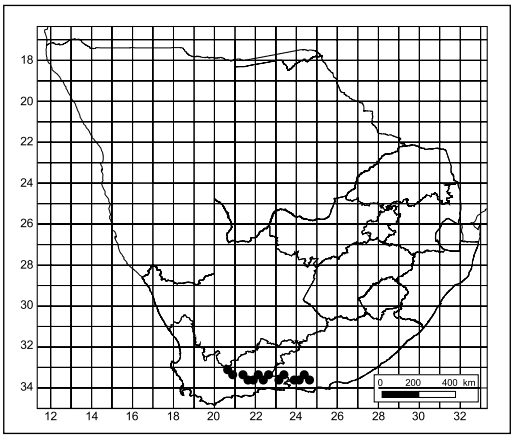

FIGURE 1.—Known distribution of *Aloe mitriformis* subsp. *comptonii*.

Apart from *Aloe pearsonii*, which is an erect branched shrub, all the other aloe members in Section *Aloe* Series *Aloe* have a procumbent, decumbent or pendent growth. These species are also more or less confined to the Succulent Karoo and Fynbos biomes. This includes mainly the Western Cape and the northwestern parts of the Northern Cape. *Aloe pearsonii* is the most distinct of the group. It is an erect, branched shrub occurring in dense stands in the lower Gariep River Valley (Central Richtersveld Mountain Shrubveld, and the adjacent northern Hunsberg in Namibia; Mucina & Rutherford 2006). *Aloe arenicola* occupies the sandy regions of the Namaqualand Coastal Duneveld (Mucina & Rutherford 2006). In terms of habitat preference, both *A. pearsonii* and *A. arenicola* occur in the Succulent Karoo and are geographically limited to the Northern Cape and adjacent Namibian territory. Three species (*A. dabenorisana*, *A. meyeri* and *A. pavelkae*) are confined to sheer cliffs of the hard metamorphic quartzitic or sandstone formations in the lower Gariep River Valley in the Desert Biome. The remaining three clearly form a related group where they occur in both the Succulent Karoo and Fynbos Biomes in the Western Cape (*Aloe perfoliata*, sensu Glen & Hardy 2000). *Aloe mitriformis* subsp. *distans* occurs in the Western Strandveld (Fynbos Biome), usually confined to sandy flats or granite outcrops of the Saldanha Bay to St Helana Bay coastal region. *Aloe mitriformis* subsp. *mitriformis* is the most widespread of the group. It occurs in the Western Cape, where it is usually confined to the Cape Fold Mountains, from the Bokkeveld Escarpment in the north to the Riviersonderend Mountains in the east, as well as the coastal region from Blaauberg (Cape Town), north to Lambertsbaai (north of Saldanha) and reaching as far north as Spoegriviermond (southern Namaqualand). Plants can be found growing on steep rugged quartzitic sandstone mountains in acidic soils, sometimes pendent from rock faces.

Aloe mitriformis subsp. *comptonii* grows further east than any other taxon in Section *Aloe* Series *Aloe* and is known from Whitehill, Laingsburg in the west to the Swartberg, east of Oudtshoorn, Uniondale, Western Cape, to the Baviaanskloof, Kouga River, Grootrivierspoort to about 60 km southeast of Steytlerville in the Eastern Cape. It grows both in mountainous terrains and the intermontane valleys, in soils derived from sandstone, Witteberg Quartzites or Enon Conglomerates, and to a lesser extent shale derived soil (usually confined to Succulent Karoo and smaller areas of Fynbos and Thicket biomes). Although the plants grow on gentle hills they are also found on sheer cliffs (Meiringspoort to Grootrivierspoort) at altitudes of 500–1 000 m. Their Succulent Karoo habitat consists mainly of Eastern Little Karoo, Willowmore Gwarrieveld and Steytlerville Karoo of the Rainshadow Valley

Karoo Bioregion (Mucina & Rutherford 2006). Rainfall in the region is during winter (mainly cyclonic) and summer (thundershowers) and ranges between 150–400 mm per annum. The substrate varies from rocky to sandy and slightly acidic soils. Various habitat observations were made at several sites throughout the species' distribution range. At Vanwykskraal, plants were found growing in flat to hilly terrain in weathered, reddish Enon Conglomerate soils. The plants grow scattered and sympatric with *Aloe striata*, *A. humilis* and *A. variegata*. Other prominent succulents observed in the immediate vicinity include *Cotyledon orbiculata* var. *spuria*, *Cotyledon papillaris*, *Gasteria brachyphylla* var. *brachyphylla*, *Haworthia truncata*, *Malephora lutea*, *Lampranthus haworthii*, *Senecio radicans*, *Tylecodon cacalioides* and *T. tuberosus*. At Rooinekpass (near Laingsburg), plants were growing among Witteberg quartz rocks on north-facing, gentle to steep mountain slopes among succulents such as *Crassula orbicularis*, *C. perforata*, *C. rupestris*, *Haworthia wittebergensis*, *Drosanthemum anemophilum* and *Tylecodon tuberosus.* The Kouga populations in the southeast (Eastern Cape) grow on Witteberg quartz formation in Groot Thicket. Associated succulent plants include *Bulbine retinens*, *Crassula rupestris* subsp. *rupestris* and *Dioscorea elephantipes*. The accompanying plate was illustrated from plants grown in the Botanical Society Conservatory, Kirstenbosch National Botanical Garden. These plants were collected from steep Enon Conglomerate slopes and cliffs on the farm Skuinsklip, east of Oudtshoorn. Associated plants include *Adromischus triflorus*, *Crassula cotyledonis*, *C. orbicularis*, *C. muscosa* var. *muscosa*, *C. perforata*, *Senecio crassulaefolius*, *Conophytum truncatum*, *Machairophyllum brevifolium* and *Lampranthus haworthii*.

Aloe mitriformis subsp. *comptonii* grows in groups with the heads mostly erect. The rounded capitate dull scarlet racemes (150 × 100 mm), in ascending panicles, grow up to a metre high and are very striking when in flower. These racemes attract sunbirds—the main pollinators of taxa in Section *Aloe* Series *Aloe*. On two occasions, yellow to orange-yellow flowering forms were observed. The first was found just north of Uniondale and the other in the Baviaanskloof, in both cases solitary clones, growing among the red-flowering forms. After flowering, the fruiting capsules, held in an erect position, ripen during summer and the seed is released during autumn. Dispersal mechanisms of semi-desert plants are generally well known and complex (Gutterman 1994). As in most aloes, the seed of *Aloe mitriformis* subsp. *comptonii* is dispersed by wind, and the erect position of the capsules enables the seed to become airborne in strong winds. Seeds germinate readily in crevices or other suitable sites, usually among other karoo shrublets. Growth is slow with plants in habitat reaching flowering size within seven years.

Reynolds named this species in honour of Professor Robert Harold Compton [1886–1979], longest serving director of the National Botanical Gardens (presently part of the South African National Biodiversity Institute). He was appointed in March 1919 and stationed at the Kirstenbosch National Botanical Garden where he remained for 34 years until 1953. Professor Compton, a graduate of Cambridge University, succeeded Professor Pearson, founder and first director of the National Botanical Gardens of South Africa (Gunn & Codd 1981).

Aloe mitriformis subsp. *comptonii* thrives in cultivation but is best grown in Succulent Karoo or dry Fynbos gardens (Van Jaarsveld 2010). Plants can be propa-

gated from seed sown during late autumn in sandy, slightly acidic soil. Cover the seed with a thin layer of sand (1–2 mm thick) and keep moist in a warm area with ample shade. Seeds germinate within three weeks. The seedlings, which are slow growing, should be transferred to individual small containers after about 12 months. These should flower about four years after sowing. Finally, plant in a sunny well drained position

Key to the species of Section *Aloe* Series *Aloe*

1a Leaves reflexed:
  2a Erect shrubs; leaves 70–90 mm . . . . . *Aloe pearsonii*
  2b Pendent from cliffs; leaves 350–400 mm . . . . . *Aloe dabenorisana*
1b Leaves not reflexed:
  3a Leaves blueish green, distinctly spotted . . . . . *Aloe arenicola*
  3b Leaves not spotted:
    4a Plants pendent from cliffs:
      5a Leaves green . . . . . *A. pavelkae*
      5b Leaves glaucous:
        6a Perianth longer than 25 mm . . . . . *A. mitriformis* subsp. *mitriformis*
        6b Perianth shorter than 25 mm . . . . . *A. meyeri*
    4b Plants not pendent:
      7a Plants procumbent:
        8a Leaves 180–200 mm long . . . . . *Aloe mitriformis* subsp. *mitriformis*
        8b Leaves 150 mm or shorter . . . . . *Aloe mitriformis* subsp. *distans*
      7b Plants decumbent rosettes ascending or erect . . . . . *Aloe mitriformis* subsp. *comptonii*

Description (after Reynolds 1950).—Plants solitary or branching, forming groups of 3 to 5 plants, with decumbent stems bearing erect rosettes up to 600 mm in diameter and 500 mm high. *Leaves* lanceolate-attenuate in a dense rosette of up to 300 × 90 mm; upper face flat but becoming slightly channelled during the dry season; lower surface convex, keeled in upper half; surface smooth, glaucous-green becoming reddish tinged during dry conditions; margin with white to yellowish teeth 2–3 mm long and 10–15 mm apart, becoming pale brown in older leaves. *Leaf sap* bitter, drying yellow. *Inflorescence* an ascending panicle bearing up to 8 racemes; bracts absent on main peduncle, few, scattered, ovate-acuminate, sub-amplexicaul, dry, white, 15 × 7 mm; racemes capitate and densely flowered, up to 150 × 90–100 mm, rounded to pointed at apex; pedicels up to 35 mm long, becoming shorter upwards; floral bracts ovate-lanceolate, 3-nerved, acuminate, white, scarious, 7 × 3 mm. *Perianth* 35–40 mm, dull scarlet, cylindric-trigonous, slightly curved and slightly enlarging in upper third; outer segments free to base, the apices sub-acute, slightly spreading; inner segments free, broader than outer segments and with obtuse apices; anthers and stigma exserted to 5 mm. *Ovary* 8.0 × 2.5 mm, green. Plate 2282.

REFERENCES

CARTER, S., LAVRANOS, J.J., NEWTON, L.E. & WALKER, C. 2011. *Aloes the definitive guide*. Royal Botanic Garden, Kew.

GLEN, H.F. & HARDY, D.S. 2000. Aloaceae (first part): *Aloe*. *Flora of southern Africa* 5(1): 1–167.

GUNN, M. & CODD, L.E. 1981. *Botanical exploration of southern Africa*. Balkema, Cape Town.

GUTTERMAN, Y. 1994. Strategies of seed dispersal and germination in plants inhabiting deserts. *The Botanical Review* 60: 373–425.

MUCINA, L. & RUTHERFORD, M.C. (eds). 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute. Pretoria.
REYNOLDS, G.W. 1950. *The aloes of South Africa*, The Aloes of South Africa Book Fund, Johannesburg.
VAN JAARSVELD, E.J. 2010. *Waterwise gardening in South Africa and Namibia*. Struik, Cape Town.
ZONNEVELD, B. 2002. Genome size analysis of selected species of *Aloe* (Aloaceae) reveals the most primitive species and results in some new combinations. *Bradleya* 20: 5–12.

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