Flowering Plants of Africa

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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 journal 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 (SANBI), but we welcome other contributions of suitable artistic and scientific merit. Please see *Guide for authors and artists* on page 159.

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Cover illustration: *Protea namaquana* (Plate 2327)

Flowering Plants of Africa

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with assistance of

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Contents

Volume 65

New taxa published in this volume

Esterhuysenia lucilleae Van Jaarsv. sp. nov., p. 96
Ruellia kaokoensis Van Jaarsv. sp. nov., p. 154

PLATE 2337 *Ipomoea bolusiana*

Ipomoea bolusiana Convolvulaceae

Tropical and southern Africa

Ipomoea bolusiana *Schinz*, Verhandlungen des Botanischen Vereins der Provinz Brandenburg, Berlin 30: 271 (1888); Hallier f.: 147 (1893); Hallier f.: 53 (1899); Baker & Rendle: 175 (1905–1906); Meeuse: 758 (1957); Roessler: 13 (1967); Adams: t. 122 (1976); Gonçalves: 100, t. 24 (1987); Van Wyk & Malan: 200 (1988); Gonçalves: 106, t. 23 (1992); Lejoly & Lisowski: 106, t. 15 (1992); Meeuse & Welman: 48 (1996); Fabian & Germishuizen: 334, t. 159c (1997); Roodt: 63 (1998); Meeuse & Welman: 107 (2000). *I. simplex* Hook.: t. 4206 (1846) *nom illegit*. *I. angustisecta* Engl.: 245 (1888). *I. mesenterioides* Hallier f.: 544 (1898). *I. bolusiana* Schinz var. *abbreviata* Hallier f.: 54 (1899). *I. bolusiana* Schinz var. *elongata* Hallier f.: 54 (1899). *I. praetermissa* Rendle: 56 (1901). *I. simplex* Thunb. var. *obtusisepala* Rendle: 174 (1905–1906). *I. bolusiana* Schinz var. *pinnatipartita* Verdc.: 118 (1967).

The genus *Ipomoea* contains about 650 species distributed worldwide in the tropical and warm temperate countries. Fifty-seven species occur in southern Africa, five of them are introduced and naturalised. The genus is paraphyletic and can be distinguished from *Convolvulus* by its spiny pollen and its stigma which is not linearly divided. It contains annuals as well as deciduous or evergreen perennials, climbing or prostrate herbs or shrubs or even small trees; some species have tubers while a few are caudiciform succulents. Several species are ornamental, some are cultivated for their edible roots, flowers, shoots and leaves, while the seeds or roots of other species provide drugs or medicine.

Mabberley (2008) listed a number of useful species that are either indigenous to Africa or cultivated on this continent. The tuberous *Ipomoea batatas* (L.) Lam. (sweet potato), a hexaploid cultigen with many cultivars, probably originally from Central America, is one of the world's most important starch foods and a staple crop in many tropical and warm areas. Some forms of *I. aquatica* Forssk. (water spinach), an Old World species, also occurring naturally in Namibia, Botswana and KwaZulu-Natal, are cultivated for their edible shoots in China and other countries and was introduced into the New World. *Ipomoea obscura* (L.) Ker Gawl. from the Old World tropics, also southern Africa, is a pot herb in Sri Lanka. A root infusion of *I. spathulata* Hallier f. from East Africa is used against eye disease. *Ipomoea pes-caprae* (L.) R.Br. from tropical and subtropical beaches, is a sand binder; the subsp. *brasiliensis* (L.) Ooststr., grows in KwaZulu-Natal and the Eastern Cape, South Africa. Hallucinogens are obtained from the seeds of some species of *Ipomoea*; the toxin is an indole alkaloid (Van Wyk et al. 2002). Several indole alkaloids are known from *Ipomoea*, such as ergine which is present in many species; large amounts can be fatal. Mabberley (2008) listed the ornamental *I. tricolor* Cav. from Mexico and Central America, where the effective hallucinogenic agent is ergoline. Apparently no South African species have so far been investigated for these alkaloids.

PLATE 2337.—1, flowering plant, × 1; 2, fruit, × 1; 3, fruit and seed, × 1. Voucher specimens: 1, *Condy 279*; 2, *Bremekamp & Schweickerdt 29552*; 3, *R. Leendertz 6620* all in National Herbarium, Pretoria. Artist: Gillian Condy.

With its usually prostrate stems and rather long and very narrow leaves or leaf lobes, *Ipomoea bolusiana*, one of the so-called 'wild morning glories', is almost inconspicuous in its natural environment when it is not flowering. However, its fairly large, usually bright pink, showy flowers attract immediate attention. This species is indigenous to Angola, the Democratic Republic of the Congo, Zambia, Zimbabwe, Mozambique, Namibia, Botswana, Swaziland and summer rainfall regions of South Africa (Limpopo, North-West, Gauteng, Mpumalanga, Free State and KwaZulu-Natal provinces, down to about 30 degrees south in the latter province) (Figure 1). Gonçalves (1987) noted that it is also found in Tanzania, but it was not included in the *Flora of Tropical East Africa* (Verdcourt 1963). Its occurrence in Madagascar (Meeuse 1957) could not be verified either.

Ipomoea bolusiana has a very wide ecological range and grows in grassland, various kinds of savanna, woodland or bushveld and shrub- or scrubland. The soil can be deep or shallow, poorly drained to well-drained sand of various colours, loam or clay which can be stony, rocky or gravelly. The substrate can be calcrete, dolomite, granite, ironstone, quartzite or sandstone. It can grow in rocky areas, as well as on dune ridges and in pans and depressions, also on the margins of wetlands. Because of its caudex (succulent and tuberous rootstock), *I. bolusiana* is very drought resistant; it can survive in disturbed areas like road- and railway sides, overgrazed and burned land, even on denuded, dry, hard, compacted soil. It can grow in shade, partial shade or full sun, on level to moderate slopes of all aspects. It has been recorded as solitary, rare, occasional to frequent or common. The flowering time is from August to April, mostly from October to March. The fruiting time is mostly from November to April. According to the information on specimen labels in the National Herbarium, Pretoria (PRE), this species can grow from about 45 to 1 525 m altitude in southern Africa. Gonçalves (1987) reported that in the *Flora zambesiaca* area, *I. bolusiana* grows in open woodland and savanna, grassland with scattered shrubs, in rocky and sandy soils at 0 to 1 465 m. According to Raimondo et al. (2009) the Red List status of *I. bolusiana* in South Africa is Least Concern.

Many succulent collectors include caudiciform plants in their collections. Rowley (1987) wrote of the Convolvulaceae: 'The perennial herbs regenerate from an underground reservoir which in a few African species is a solid, smooth-skinned black or brown caudex suited to grace the glasshouse of any devotee of caudiciforms. Unlike so many caudiciforms, Ipomoeas have large, showy bisexual flowers, and because these are borne freely low down and not just at the top of metres of vine, the plants are suitable for a small glasshouse or show bench. The caudex, which is sensitive to rot, should be planted above ground on a grit base and allowed to dry off during the dormant season when the branches die away.' Among the southern African species credited with having a caudex are *Ipomoea bolusiana*, *I. simplex* Thunb., *I. transvaalensis* A.Meeuse and *I. welwitschii* Vatke ex Hallier f. Some representatives of the closely related genus *Merremia* with white or yellow blooms may also qualify, such as the Namibian endemic *M. bipinnatipartita* (Engl.) Hallier f. Rowley (1976) stated, '… many South African Convolvulaceae have a massive perennial caudex, and the fact that it grows underground is no deterrent to the enthusiast who happily pots it above the soil so that he can admire its distinctive bark and noble contours. And the plants seem none the worse for such unnatural treatment.' He wrote the following notes on the cultivation of *I. bolusiana* in the northern hemisphere: 'It offers no special problems in cultivation. I keep it in the warmest section of the greenhouse and withhold water until the first signs of growth in

early spring. It is then watered freely. … the purple flowers appear in succession over a long period near the base of the annual branches. Each one lasts no more than a day …'

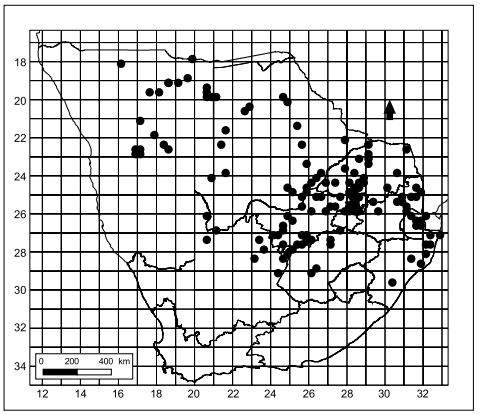

FIGURE 1.—Known distribution of *Ipomoea bolusiana* in southern Africa.

Roodt (1998) reported that, 'In the Kalahari, this species features very prominently as a source of moisture. The flattened tuber, which is about 15 cm wide, can be scraped and the moisture squeezed directly into the mouth.' According to *De Winter 3791* (PRE), collected in Namibia in December 1955, the tubers are 3 to 4 inches in diameter. Very young tubers are eaten and have a faintly sweet, watery taste. Elephants dig up and eat the tubers which are plentiful in some areas. *Snyman & Noailles 247* (PRE), collected in Botswana in February 1982, noted that the c. 80 mm tuber is stamped and the liquid squeezed out for drinking. The tuber is also cut in slices and cooked in milk for drinking. These two collectors made a survey of plants used by the Bushmen; the common name for *Ipomoea bolusiana* is *n//arii* and *irixa*. In Tswana it is called *kgane-ya mothlaba*. By contrast, *Story 6210* (PRE), collected in Namibia in January 1958, stated that the tuber is not eaten by the !khu Bushmen who call the plant *!garube*. *Mongalo 7* (PRE), from Blouberg in Limpopo Province, gave the local names as *monna ga a apare* and *se thea motse*. *Van der Walt 5799* (PRE), from the Kalahari Park in the Northern Cape in 1978, gave the name as *X'Horo*. *Repton 4778* (PRE), collected near Postmasburg in the Northern Cape in 1958, gave the common name as *duikerswortel*; duikers (small antelopes) eat the stems but not the bitter tubers. *Speedy 270* (PRE) from Vryburg in the Northern Cape in 1989, stated that it is drought resistant and readily eaten by cattle. *Burgoyne 3396* (PRE), collected in Namibia in March 1995, reported that the crushed leaves are non-aromatic, the cut twigs exude a clear sap, the flowers have no smell and that there can be several tubers to a plant.

The species name *bolusiana* commemorates the South African botanist and businessman Harry Bolus (1834–1911) who undertook collecting expeditions to various parts of South Africa. He described many new species and also produced his own illustrations. His main interests were the Orchidaceae and Ericaceae; he co-authored the Ericaceae for *Flora capensis*. The Bolus Herbarium at the University of Cape Town was named after him after he had donated his collections and library to that university (Gunn & Codd 1981).

According to Austin & Huáman (1996), *Ipomoea bolusiana* belongs to section *Erpipomoea* Choisy (section *Leiocalyx* Hallier f. *sensu stricto*) which falls under subgenus *Eriospermum* (Hallier f.) Verdc. ex D.F.Austin. This common and variable species is closely related to and can be confused with two other species in that section, namely *I. simplex* and *I. welwitschii*. *Ipomoea bolusiana* differs from the former by its large pink to purple corolla and from the latter by its leaf morphology and glabrous vegetative parts. *Ipomoea simplex* has a white corolla and is endemic to the central and eastern parts of southern Africa,

including Lesotho. The rare and variable *I. welwitschii* occurs in tropical Africa down to northern Namibia and Botswana. It is possible that these three species form one large, variable aggregate species.

The specimen used as voucher for the accompanying plate was cultivated at the Random Harvest Nursery in Muldersdrift, Gauteng, from the collection of indigenous plants built up by the late Charles Craib. It was originally collected in the Rustenburg/Brits area in the North-West Province.

Description.—Glabrous perennial geophyte. *Rootstock* tuberous, one to several light brown tubers per plant, mostly subglobose, also spindle-shaped to ovoid, up to 130 mm in diameter, frequently quite deep underground at the upper end of an up to 300 mm long taproot; ± milky inside. *Stems* annual, one or several, spreading, erect or prostrate, slender, woody at base, erect stems up to 300 mm high, prostrate ones up to 3 m or longer, pale green. *Leaves* either palmately 3–9-sect (mainly on prostrate stems) with segments 20–70 × 0.5–3.0 mm, or simple, linear to bilobed, 40–150 × 2–7 mm, sometimes pinnate, if 3 then terminal segments partly fused to form a common rhachis, keeled, dark green above, margins ± revolute, also serrated or undulate; petiole of dissected leaves up to ± 20 mm long, of simple leaves sometimes inconspicuous. *Peduncles* 1-flowered, usually very short; bracteoles often deciduous; pedicels short, thickened. *Sepals* lanceolate to elliptic or broadly ovate, acute or acuminate, equal or unequal, dark green with hyaline margins, persistent in fruit, 7–20 mm long. *Corolla* funnel-shaped, 40–70 × 40–60 mm, usually bright magenta-pink, lighter outside and darker in centre and on midpetaline areas, also lighter pink to reddish or purplish. *Capsule* subglobose-conical, red-brown, 10–12 mm long and in diameter, apex often depressed, apiculate by style base, splits into 4 sections. *Seeds* 4, 4.5–7.0 mm long, densely covered with 4–6 mm long, shiny, silky, fawn hairs. *Chromosome number*: unknown. Plate 2337.

REFERENCES

ADAMS, J. 1976. *Wild flowers of the northern Cape*. Department of Nature and Environmental Conservation, Cape Town.

AUSTIN, D.F. & HUÁMAN, Z. 1996. A synopsis of *Ipomoea* (Convolvulaceae) in the Americas. *Taxon* 45: 3–38.

BAKER, J.G. & RENDLE, A.B. 1905–1906. Convolvulaceae. In W.T. Thiselton-Dyer, *Flora of tropical Africa* 4,2: 62–206. Reeve, London.

ENGLER, H.G.A. 1888. Plantae marlothianae. Ein beitrag zur Kenntnis der Flora Südafrikas. *Botanische Jahrbücher* 10: 242–285.

FABIAN, A. & GERMISHUIZEN, G. 1997. *Wild flowers of northern South Africa*. Fernwood Press, Vlaeberg.

GONÇALVES, M.L. 1987. 117, 118. Convolvulaceae–Cuscutaceae. In E. Launert (ed.), *Flora zambesiaca*, Vol. 8,1.

GONÇALVES, M.L. 1992. 113. Convolvulaceae. *Flora de Moçambique*. Instituto de Investigaçào Cientifica Tropical. Centro de Botânica, Lisbon.

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

HALLIER, H. 1893. Convolvulaceae africanae. *Botanische Jahrbücher* 18: 81–160.

HALLIER, H. 1898. Beiträge zur Kenntnis der Afrikanischen Flora. Convolvulaceae. *Bulletin de l'Herbier Boissier* 6: 529–548.

HALLIER, H. 1899. Convolvulaceae africanae II. *Botanische Jahrbücher* 28: 28–54.
HOOKER, W.J. 1846. *Ipomoea simplex*. *Curtis's Botanical Magazine* 72: t. 4206.
LEJOLY, J. & LISOWSKI, S. 1992. Les genres *Merremia* et *Ipomoea* (Convolvulaceae) dans la flore d'Afrique Centrale (Zaire, Rwanda, Burundi). *Fragmenta floristica et geobotanica* 37,1: 21–125.
MABBERLEY, D.J. 2008. *Mabberley's Plant-book: a portable dictionary of plants, their classification and uses*, 3rd ed. Cambridge University Press, Cambridge.
MEEUSE, A.D.J. 1957. The South African Convolvulaceae. *Bothalia* 6: 641–792.
MEEUSE, A.D.J. & WELMAN, W.G. 1996. Convolvulaceae. New records, name changes and a new combination in southern Africa. *Bothalia* 26: 46–50.
MEEUSE, A.D.J. & WELMAN, W.G. 2000. Convolvulaceae. *Flora of southern Africa*, Vol. 28,1. National Botanical Institute, Pretoria.
RAIMONDO, D., VON STADEN, L., FODEN, W., VICTOR, J.E., HELME, N.A., TURNER, R.C., KAMUNDI, D.A. & MANYAMA, P.A. (eds). 2009. Red list of South African plants. *Strelitzia* 25. South African National Biodiversity Institute, Pretoria.
RENDLE, A.B. 1901. Notes on African Convolvulaceae. *Journal of Botany, British and Foreign, London* 39: 12–22, 55–64.
RENDLE, A.B. 1905–1906. Convolvulaceae. In W.T. Thiselton-Dyer (ed.), *Flora of tropical Africa* 4,2: 62–206. Reeve, London.
ROESSLER, H. 1967. 116. Convolvulaceae. In H. Merxmüller (ed.), *Prodromus einer Flora von Südwestafrika*. Cramer, Weinheim.
ROODT, V. 1998. *Common wild flowers of the Okavango delta, medicinal uses and nutritional value*. Shell Field Guide Series: Part II. Shell Oil Botswana, Gaborone.
ROWLEY, G.D. 1976. *Ipomoea bolusiana* Schinz. *Excelsa* 6: 61, 92.
ROWLEY, G.D. 1987. *Caudiciform and pachycaul succulents*. Strawberry Press, Mill Valley.
SCHINZ, H. 1888. *Verhandlungen des Botanischen Vereins der Provinz Brandenburg, Berlin*. Vol. 30.
VAN WYK, B. & MALAN, S. 1988. *Field guide to the wild flowers of the Witwatersrand and Pretoria region*. Struik, Cape Town.
VAN WYK, B-E., VAN HEERDEN, F. & VAN OUDTSHOORN, B. 2002. *Poisonous Plants of South Africa*. Briza, Pretoria.
VERDCOURT, B. 1963. Convolvulaceae. In C.E. Hubbard & E. Milne-Redhead (eds), *Flora of tropical East Africa*.
VERDCOURT, B. 1967. New Convolvulaceae from the *Flora zambesiaca* area. II. *Kirkia* 6: 117–122.

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