*Phytotaxa* 418 (3): 237–257
https://www.mapress.com/j/pt/


**Article**

ISSN 1179-3155 (print edition)
PHYTOTAXA
ISSN 1179-3163 (online edition)

https://doi.org/10.11646/phytotaxa.418.3.1

# Taxonomic revision of South African *Memecylon* (Melastomataceae—Olisbeoideae), including three new species

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## Abstract

Earlier works recognised two South African species *Memecylon bachmannii* and *M. natalense* within *M.* sect. *Buxifolia*, but recent molecular analyses have revealed that *M. natalense* as previously circumscribed is not monophyletic and includes several geographically outlying populations warranting treatment as distinct taxa. In this revision we recognise five endemic South African species of which *M. bachmannii* and *M. natalense* are both maintained but with narrower circumscriptions, and *M. kosiense*, *M. soutpansbergense* and *M. australissimum* are newly described. *Memecylon kosiense* is localised in north-eastern KwaZulu-Natal (Maputaland) and is closely related to *M. incisilobum* of southern Mozambique. *Memecylon soutpansbergense*, from Limpopo Province, was previously confused with *M. natalense* but is clearly distinguished on vegetative characters. *Memecylon australissimum* occurs in the Eastern Cape (Hluleka and Dwesa-Cwebe nature reserves) and has relatively small leaves like those of *M. natalense*, but the floral bracteoles are persistent and the fruit is ovoid as in *M. bachmannii*. We further designate a lectotype for *M. natalense*, provide an updated key to the South African species of *Memecylon*, and provisionally assess the status of each species in accordance with International Union for Conservation of Nature criteria.

## Introduction

*Memecylon* Linnaeus (1753: 349) is a paleotropical genus of shrubs to trees with 350+ species (Renner *et al.* 2007 onwards). In accordance with morphological and recent molecular findings (Jacques-Félix 1978, Bremer 1982, Stone 2006, Stone & Andreasen 2010, Stone 2014), it is now circumscribed to exclude the monospecific western and central African genus *Spathandra* Guill. & Perr. (in Guillemin *et al.* 1833: 313), the paleotropical *Lijndenia* Zoll. & Moritzi (in Moritzi 1846: 10) and the African-Madagascan *Warneckea* Gilg (1904: 100). In addition to these four Old World genera, the subfam. Olisbeoideae also includes the neotropical *Mouriri* Aublet (1775: 452) and *Votomita* Aublet (1775: 90).

In South Africa, recent treatments have recognised two species of *Memecylon* sensu stricto, viz. *M. bachmannii* Engler (1921: 768) and *M. natalense* Markgr. (in Mildbraed 1934: 1078), both of which are small evergreen trees of shaded forest-understorey environments (Van Wyk 1983, Coates Palgrave 2002, Germishuizen *et al.* 2006, Boon 2010). *Memecylon bachmannii* occurs near the coast in Pondoland (Eastern Cape) and southern KwaZulu-Natal, while *M. natalense* inhabits somewhat drier forests of the same region and has a wider but sporadic distribution northward to Mpumalanga and Limpopo. The range of *M. natalense* had also been reported as extending to northern Mozambique and southern Malawi (Fernandes & Fernandes 1972, 1978, 1980; but see below). Both species have been placed in *M.* sect. *Buxifolia* R.D.Stone (2014: 557) diagnosed by the combination of branchlets with successive nodes alternating between normal leaves and reduced, often inflorescence-bearing bracts, petals white with corolla rounded to apiculate in bud, and anther connectives bearing a dorsal oil-gland. A third South African species, previously identified as *M. sousae* A. Fernandes & R. Fernandes (1972: 67), is currently known as *Warneckea parvifolia* R.D. Stone & Ntetha (2013: 320).

*Accepted by Renato Goldenberg: 11 Sept. 2019; published: 25 Sept. 2019*

Recent studies based on nrDNA sequences (Stone 2014, Stone *et al.* 2017a) have revealed that *Memecylon natalense* as previously circumscribed is not monophyletic and includes some divergent evolutionary lineages best treated as separate species. These include the newly described *M. incisilobum* R.D.Stone & I.G.Mona from southern Mozambique, *M. nubigenum* R.D.Stone & I.G.Mona from northern Mozambique and southern Malawi, and *M. rovumense* R.D.Stone & I.G.Mona from northern Mozambique and southern Tanzania (Stone *et al.* 2017b). In South Africa, an isolated coastal population from near Kosi Bay (north-eastern KwaZulu-Natal) was found to have 100% nrETS and nrITS sequence identity with *M. incisilobum*, but morphological comparisons (based on flowering and fruiting collections) have shown it is amply distinct from both *M. incisilobum* and *M. natalense* sensu stricto. Another isolated population in the Soutpansberg (Limpopo Province) was previously treated as *M. natalense* but is evidently the sister-group of a clade consisting of *M. natalense* sensu stricto + *M. bachmannii* (Stone *et al.* 2017a). On the other hand, the nrDNA spacer sequences of *M. natalense* sensu stricto and *M. bachmannii* were found to be identical or nearly so, a surprising result given the clear morphological differences between these two species. Also belonging to this latter group is a small-leaved *Memecylon* from the Eastern Cape (Hluleka and Dwesa-Cwebe nature reserves) that has been misidentified as *M. natalense* or *M. bachmannii* by previous collectors.

In light of these findings, we undertook a morphological study of South African *Memecylon* with the aim of identifying taxonomically important characters (Mona 2019). This study was based on a sample of 227 collections kept in the NU or UDW herbaria, obtained on loan from other institutions (BNRH, K, NH, PRE, PRU) or collected in the wild (deposited in NU).

Here we provide a revised treatment of South African *Memecylon* that includes a narrower circumscription of both *M. bachmannii* and *M. natalense*, as well as the recognition of three new species. For each taxon, the extent of occurrence (EOO) and area of occupancy (AOO) were estimated using GeoCAT (Bachman *et al.* 2011), and their conservation status is provisionally assessed in accordance with the *IUCN Red List Categories and Criteria* (International Union for Conservation of Nature 2012). We also present a dichotomous key for identification of the five presently recognised species of South African *Memecylon*.

## Taxonomy

### 1. ***Memecylon kosiense*** R.D.Stone & I.G.Mona, *sp. nov.* (Figs. 1, 2A–B)

Type:—SOUTH AFRICA. KwaZulu-Natal: Kosi Bay Nature Reserve, ca. 0.8 km southwest of where the Sihadla (Siyadla) River flows into Lake Amanzimnyama, elev. ca. 20 m, 27°02′14.1″S, 32°48′45.8″E, in high, mature, lowland forest on loamy sand, 08 December 2016, *Stone & Mona 2795* (holotype NU!, isotypes BNRH!, K, NH, PRE).

Evergreen understorey to subcanopy tree 4–10 (–12) m tall; bark brownish grey, longitudinally fissured; young branchlets slender, quadrangular to narrowly quadrangular-alate; older branchlets terete, whitish grey, longitudinally fissured; nodes thickened; internodes between normal leafy nodes 2–3 (–6) cm long. Leaves subcoriaceous, dark green and glossy above, somewhat paler below; petioles 1.5–3 mm long; blades elliptic to obovate, (3–) 4–6 (–8) × (1.2–) 1.8–3 (–3.8) cm, cuneate at base (margins curved slightly inward) and confluent with the petiole, ± broadly and obtusely acuminate at apex, the acumen (2–) 3–6 (–8) mm long (sometimes indistinct or with apex acute); midnerve clearly visible, impressed on the adaxial surface, ± prominent abaxially (especially toward the leaf base); one pair of lateral nerves faintly visible on both surfaces, the course curvilinear and 1–3 mm from the margin in the basal half of the blade; transverse veins 4–5 pairs, faintly visible, oblique relative to the midnerve, ± prominent on both upper and lower surfaces in dried material. Cymes 1–3 (–5)-flowered, solitary or in fascicles of 2–3 at the defoliated nodes of older branchlets, less often in the leaf axils and at the bracteolate nodes alternating with those bearing fully developed leaves, occasionally borne terminally; peduncles (0.5–) 3–5 (–6.5) mm long; secondary axes 1–3 in number, mostly 2–3 mm long, additional axes when present of similar dimensions; bracts rapidly deciduous. Flowers borne individually at the ends of the inflorescence axes, on pedicels 1–2 (–3) mm long; hypantho-calyx green, obconic to cupulo-patellate, 3 × 4 mm, margin sinuate-dentate; lobes broadly rounded, each with scarious margin ca. 0.5 mm high, irregularly erose-denticulate (occasionally with one or more lobes incised to form larger teeth); corolla in bud rounded-apiculate; petals white, broadly ovate to suborbicular, 4 × 4−4.5 mm, apex apiculate; staminal filaments 4–6 mm long; anthers dolabriform, 1–1.25 × 1.5–1.8 mm, the connective yellow in colour and strongly incurved by the dorsal oil-gland, thecae positioned at the anterior end; style 8–10 mm long, epigynous chamber with membranous partitions forming

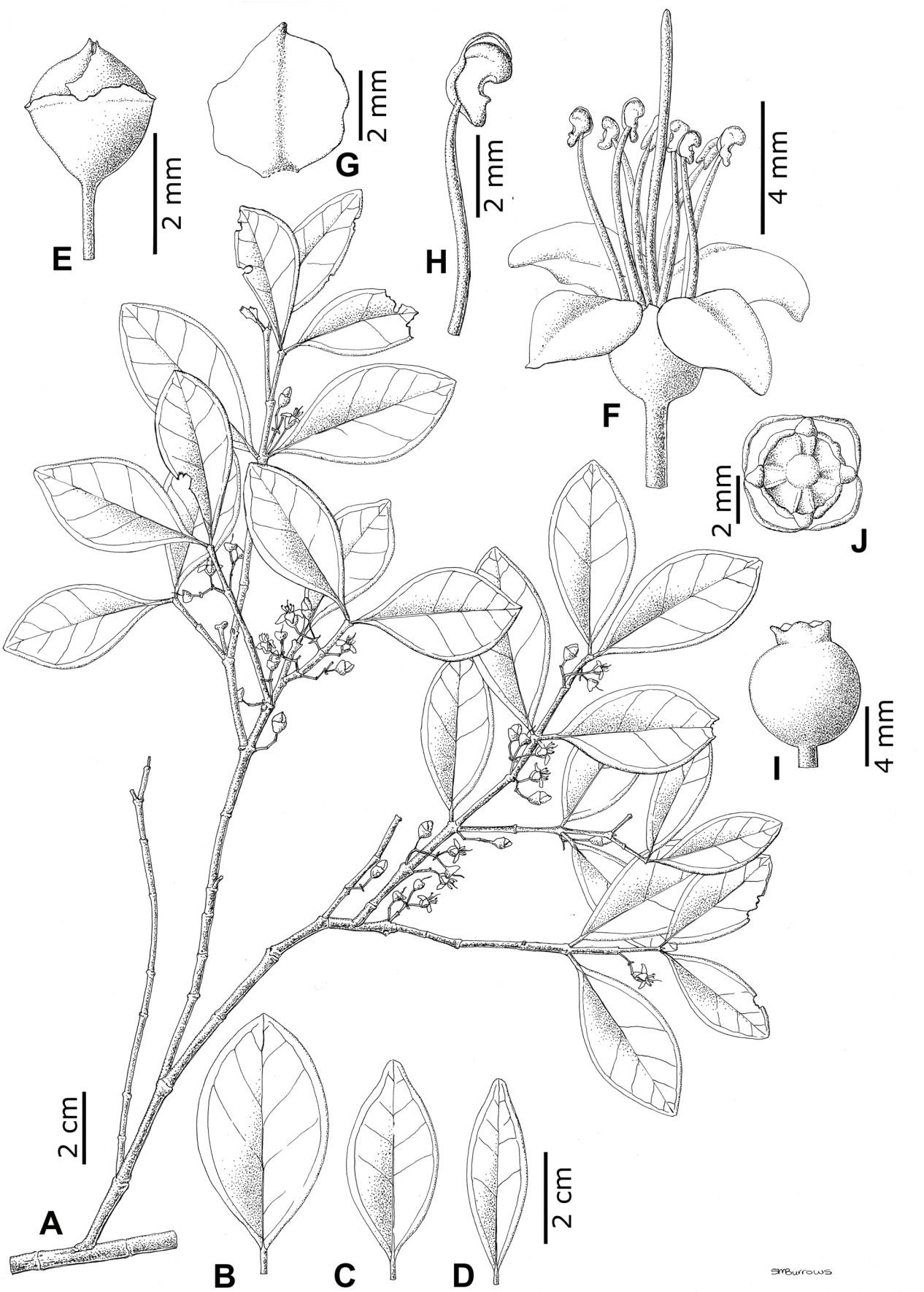


**FIGURE 1.** ***Memecylon kosiense***. **A.** Flowering branch. **B–D**. Leaves. **E.** Floral bud. **F.** Open flower. **G.** Petal. **H.** Stamen. **I.** Fruit. **J.** Epigynous chamber (top view). (**A–B**, **E–H** from *Stone & Mona 2795*; **C** from *Stone et al. 2806*; **D**, **I–J** from *Stone et al. 2807*. Illustration by Sandie Burrows.)

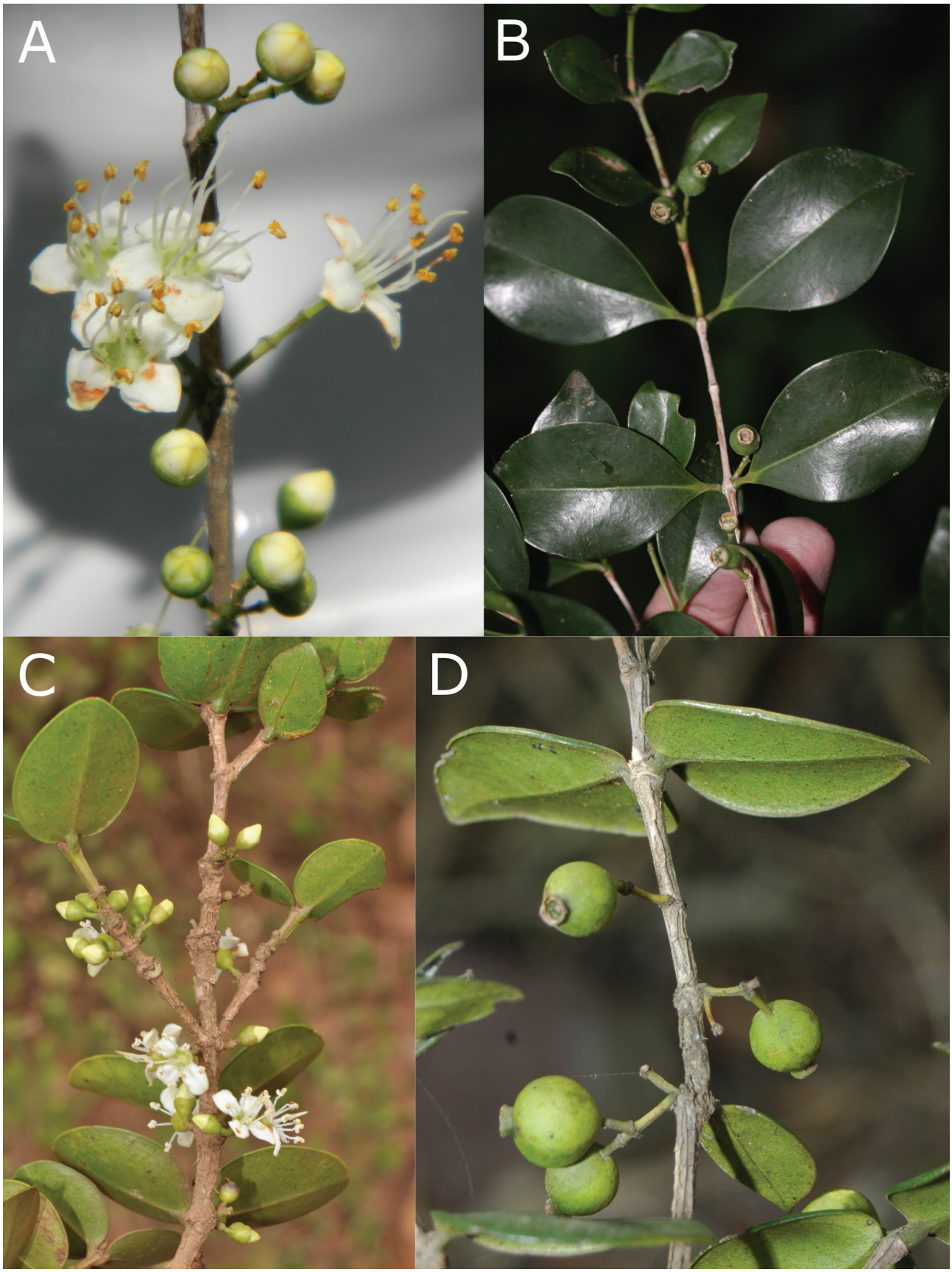


**FIGURE 2. A.** ***Memecylon kosiense***, flowers; **B.** ***Memecylon kosiense***, fruiting branchlet. **C.** ***Memecylon soutpansbergense***, flowering branch. **D.** ***Memecylon soutpansbergense***, fruiting branch. Photograph in **A** by R. D. Stone; in **B** by David Styles; in **C**–**D** by John Burrows.

a V-shaped structure beneath each petal and with a low, non-membranous ridge radiating from the base of style towards each episepalous stamen. Immature fruits green, subglobose, 7–8 mm in diameter, crowned by the persistent calyx 1.5–3 mm high, lobes rounded, scarious, erect.

**Distribution and habitat**:—Known only from the type locality in Kosi Bay Nature Reserve, north-eastern KwaZulu-Natal, South Africa (Fig. 3). Habitat in high, mature, lowland forest on loamy sand at ca. 20–25 m elevation. The population is possibly more extensive in the area around Lake Amanzimnyama; additional field-work needed to confirm this.

**Etymology**:—The species epithet refers to the Kosi Bay Nature Reserve, the only known locality of this species.

**Phenology**:**—**Flowers in early December; submature fruits in early February.

**Conservation status**:**—***Memecylon kosiense* is known from a single location with an AOO of 4 km$^2$ (assuming a 4 km$^2$ grid cell size). The population occurs within a formally protected area, the Kosi Bay Nature Reserve, which is part of the larger iSimangaliso Wetland Park administered by the iSimangaliso Authority. Threats in the area are not well documented but may include limited use of forest resources by local people (e.g., selective removal of timber) and uncontrolled bush fires which may enter the forest during extended periods of drought. There is also increasing human population pressure outside the reserve, in the vicinity of the town of Manguzi (KwaNgwanase). Of more immediate concern is the evidently small size of the *Memecylon* population (ca. 50 individual trees) and its very limited AOO, such that a single event with a large impact (e.g., fire) could conceivably affect all of the known individuals. *Memecylon kosiense* is thus provisionally assessed as 'Vulnerable' [VU D2].

**Discussion:**—*Memecylon kosiense* is closely related to the Mozambican *M. incisilobum*, as evidenced by the 100% nrDNA sequence identity between these two populations (Stone 2014, Stone *et al.* 2017a). Both populations are found in the region of north-eastern KwaZulu-Natal and southernmost Mozambique known as Maputaland (Van Wyk 1996, Van Wyk & Smith 2001), but are separated from each other by an airline distance of ca. 200 km.

The new species differs from *M. incisilobum* by having cymes solitary or in fascicles of 2−3 (vs cymes solitary or rarely geminate); inflorescence axes shorter (peduncles mostly 3−5 mm not 5–10 mm, secondary axes mostly 2−3 mm not 3.5−7 mm); flowers less numerous (mostly 1−3, rarely 4–5 vs up to 9 flowers per cyme); hypantho-calyx obconic to cupulo-patellate (vs broadly cupuliform); calyx-lobes with scarious margin ca. 0.5 mm high and irregularly erose-denticulate or occasionally with one lobe shallowly incised (vs calyx-lobes with scarious margin ca. 1 mm and regularly incised ± to the base); corolla in bud rounded-apiculate (vs sharply apiculate with apiculum ca. 1 mm high); style 8–10 mm long (vs ca. 7 mm); and fruit with calycinal crown not thickened and collar-like, lobes erect (vs fruits with calycinal crown thickened and collar-like with lobes curved inwards). There also seems to be a difference in their respective flowering times (early December for *M. kosiense*, late October for *M. incisilobum*).

**Additional specimens examined:—**SOUTH AFRICA. KwaZulu-Natal: Kosi Bay Nature Reserve, Sihadla forest where Sihadla River flows into Lake Amanzimnyama, 01 December 2002, *Styles 1391* (NU!); Kosi Bay Nature Reserve, in tall mature lowland forest, 09 April 2011, *Styles 3539* (NH!); type locality, 07 February 2017, *Stone et al. 2806* & *2807* (BNRH!, NU!, NH, PRE); type locality, 29 November 2017, *Stone & Amarasinghe 2823* & *2824* (NU!).

**2. *Memecylon soutpansbergense*** R.D.Stone & I.G.Mona, *sp. nov.* (Figs. 2C–D, 4)

Type:—SOUTH AFRICA. Limpopo: E. Soutpansberg, ca. 5 km east of Tshumulungwi on road to Mufulwi, elev. 1,124 m, 22°43′50″S, 30°27′10″E, amongst rocks in bush clump on quartzite, 28 November 2013, *J. Burrows & S. Burrows 13905* (holotype BNRH!, isotypes K!, NU!).

Evergreen shrub or small tree 2–3 (–5) m tall; bark brownish grey, longitudinally furrowed; young branchlets green, acutely quadrangular to narrowly quadrangular-alate; older branchlets terete, pale brown to whitish grey, longitudinally fissured; nodes thickened; internodes between normal leafy nodes 1.8–4 (–5.4) cm. Leaves subcoriaceous, bright green and shining on upper surface, paler and dull beneath; petioles 0.5–2 mm long; blades ovate to broadly ovate or suborbicular, (2.5–) 3–4.5 (–5.5) × (1.8–) 2–3.5 cm, rounded to subcordate at base, rounded to obtuse, acute or ± broadly and vaguely acuminate at apex; midnerve clearly visible, impressed on the upper surface, ± prominent on the lower (especially toward the leaf base); one pair of lateral nerves faintly visible on both surfaces; transverse veins faintly visible and ± prominent on upper surface, obscure beneath, shallowly oblique to oblique relative to the midnerve. Cymes 1–1.5 (–2.5) cm long, 1–3-flowered, solitary or in fascicles of 2 mostly at the defoliated nodes of older branchlets (sometimes axillary and at the intervening 'aphyllous' nodes); peduncles 5–8 (–10) mm long; secondary

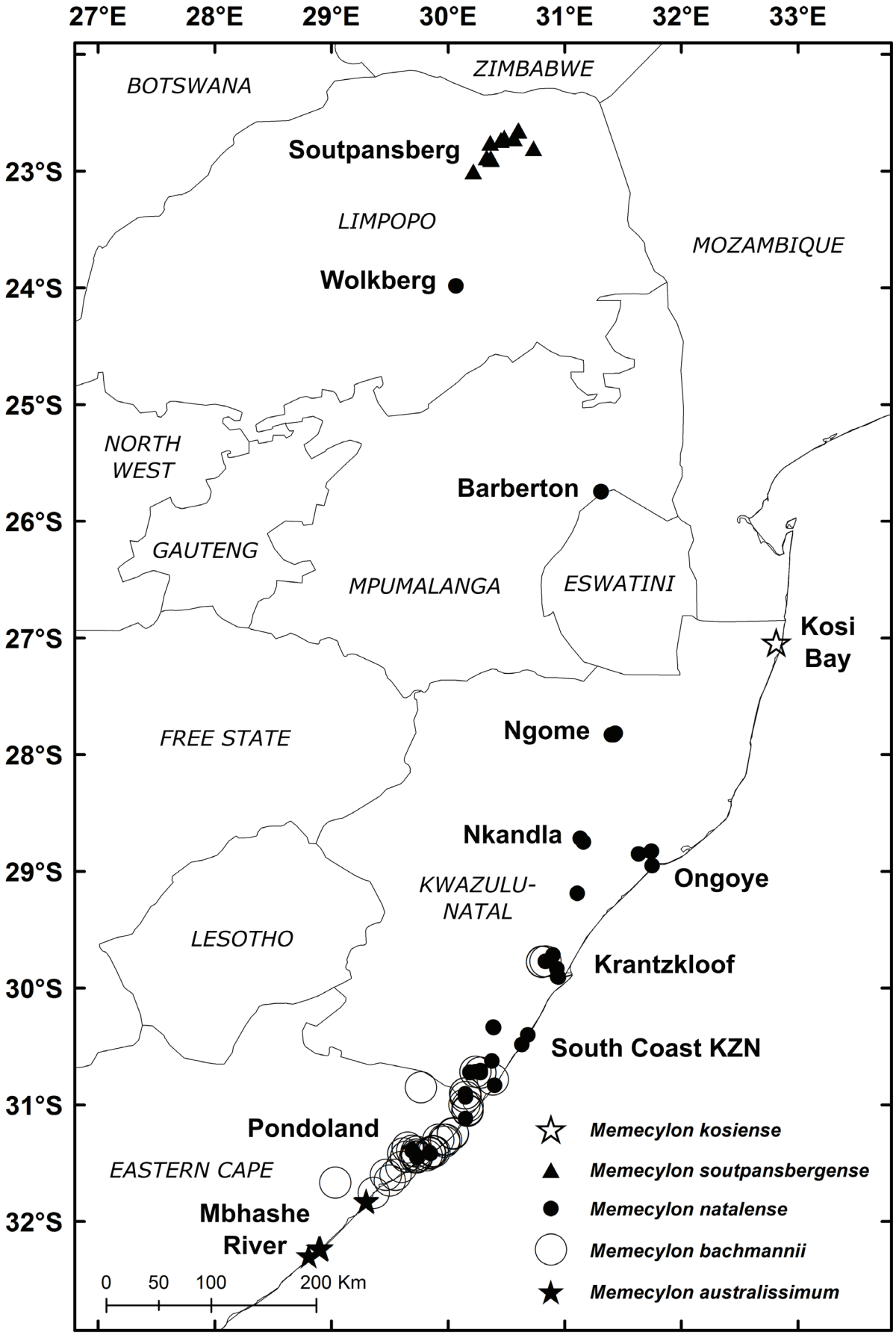


**FIGURE 3.** Distribution of *Memecylon* species in South Africa.

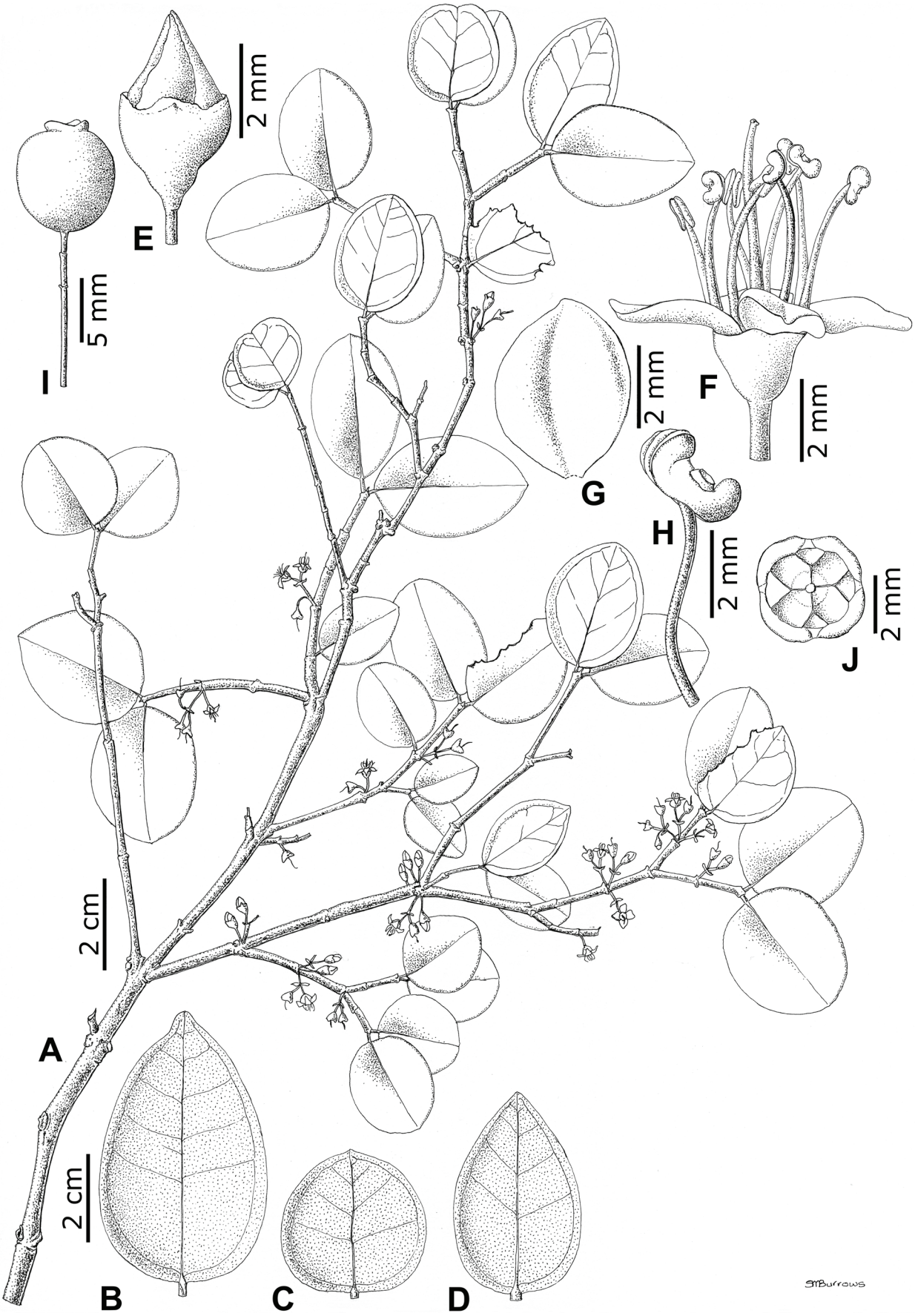


**FIGURE 4.** ***Memecylon soutpansbergense***. **A.** Flowering branch. **B–D.** Leaves. **E.** Floral bud. **F.** Open flower. **G.** Petal. **H.** Stamen. **I.** Fruit. **J.** Epigynous chamber (top view). (**A**, **E–H** from *Burrows 13905*; **B** from *Burrows et al. 13712*; **C** from *Burrows 10610*; **D** from *Burrows et al. 13710*; **I–J** from *Burrows 10610*. Illustration by Sandie Burrows.)

axes mostly 5–10 mm long; bracts rapidly deciduous. Flowers borne individually at the ends of the inflorescence axes on pedicels 3–4 (–5) mm; hypantho-calyx green, campanulate, 2–3 × 2–4 mm, margin shallowly sinuate-dentate; calyx-lobes broadly rounded to triangular, 1 × 1 mm; corolla in bud pale yellow, conical, apex obtuse; petals white, broadly ovate to suborbicular, 3–4 × 2–3 mm, apex apiculate; staminal filaments 5–9 mm long; anthers dolabriform, 1–1.5 × 1–2 mm, connective white, strongly incurved by the dorsal oil-gland, thecae positioned at the anterior end; style filiform, 6–10 mm, epigynous chamber with membranous partitions forming a V-shaped structure beneath each petal and with a low, non-membranous ridge radiating from the base of style towards each episepalous stamen. Fruits baccate, subglobose, to 7 mm in diameter, green becoming purple at maturity; persistent calycinal crown 1–2 mm high.

**Distribution and habitat**:—Endemic to the Soutpansberg mountain range of northern South Africa (Limpopo Province; Van Wyk & Smith 2001, Hahn 2002, Hahn 2017); elevation 920–1300 m (Fig. 3). Habitat in 'Northern Mistbelt Forest' (Mucina & Geldenhuys 2006) and streamside forest, and in the complex vegetational mosaic described as 'Soutpansberg Mountain Bushveld' (Rutherford *et al.* 2006), an unusual habitat for *Memecylon* that is neither forest nor savanna.

**Etymology**:—The species epithet refers to the Soutpansberg mountain range in Limpopo Province, South Africa.

**Phenology:—**Floral buds in late September; open flowers late November to early December; fruits early February to mid-April (also recorded in late June and early September).

**Conservation status**:—*Memecylon soutpansbergense* is known from 10 locations with an EOO of 850 km$^2$ and an AOO of 36 km$^2$ (assuming a 4 km$^2$ grid cell size). Most of these locations are on tribal land and receive no formal protection from anthropogenic activities such as wood harvesting for fuel and building materials or clearing of land for agriculture. Although these threats are not currently high, they are expected to increase as human population pressure increases in this region. The locations in the Entabeni and Thathe Vondo state forests are managed by the South African Dept. of Agriculture, Forestry and Fisheries (DAFF) and likely receive some degree of protection, although field-work is needed to verify this. *Memecylon soutpansbergense* is thus provisionally assessed as 'Vulnerable' [B1a,b(iii) + B2a,b(iii)].

**Discussion:—**In the nrDNA phylogeny of southern African *Memecylon* (Stone *et al.* 2017a), *M. soutpansbergense* belongs to an exclusively South African clade, and within this group it is sister to a clade consisting of *M. bachmannii* + *M. natalense* sensu stricto.

The new species has been previously confused with *M. natalense* but differs in having young branchlets acutely quadrangular to narrowly quadrangular-alate (vs slender and subquadrangular); leaves subsessile or on petioles to 2 mm long (vs distinctly petiolate, the petioles 2–4 mm long); leaf-blades broadly ovate to suborbicular (vs mostly elliptic-ovate to broadly ovate); leaf-bases rounded to subcordate (vs cuneate); leaf-apices rounded to obtuse, acute or vaguely obtuse-acuminate (vs distinctly and acutely acuminate); and corolla in bud conical-obtuse (vs rounded to subacute). There also appears to be a difference in the position of the inflorescence (mostly at the defoliated nodes of older branchlets in *M. soutpansbergense* vs mostly axillary and at the intervening 'aphyllous' nodes in *M. natalense*). However, this difference is not entirely consistent, because in the collection *Van Wyk 4275*, PRU (representing the population of *M. soutpansbergense* at the Mahovhohovho waterfall) the inflorescence position is axillary as in *M. natalense*.

**Additional specimens examined**:**—SOUTH AFRICA. Limpopo:** Entabeni Forest, patch forest on rocks on mountains, January 1925, *Keel* s.n. (PRE!); Sibasa district, Tate Vondo Forest Reserve, along Tshirovha River, elev. 1,035 m, 22°53′S, 30°22′E, 10 December 1977, *Hemm 420* (PRE!); Tate Vondo, elev. 1,050 m, rocky river bank in partial shade, 30 June 1978, *Hemm* s.n. (K!, MO!, PRE!); Vendaland, Tate Vondo, naby Mahovho-hovho Waterval, 19 April 1979, *Van Wyk 2803* (PRE!, PRU!); same locality, 20 April 1979, *Van Wyk 2852* (PRU!); Entabeni Staatbos, elev. 1,300 m, 13 June 1979, *von Breitenbach* s.n. (PRE!); Venda region, Tate Vondo, Mahovho-hovho waterval, 06 February 1980, *Van Rooyen* s.n. (PRU!); same locality, 06 February 1980, *Van Wyk 3634* (PRE!, PRU!); Venda region, Tshaulu, Mutanzhela, savanne, 10 April 1980, *Van Wyk 3872* (PRU!); Venda region, Thengwe, Vuvha, savanne, 11 April 1980, *Van Wyk 3931* (PRU!); Venda region, Dzimauli, savanne, 12 April 1980, *Van Wyk 4062* (PRU!); Venda region, ca. 1 km from Dzamba on the way to Rambuda, thicket, 12 April 1980, *Van Wyk 4085* (PRU!); Venda region, along the Tshirovha River at the Mahovho-hovho waterfall, forest, 13 April 1980, *Van Wyk 4154* (PRU!); same locality, 02 December 1980, *Van Wyk 4275* (PRU!); Thathe Vondo Forest Reserve, next to road between Wyllie's Poort and Thohoyandou immediately west of Thathe Vondo, elev. 985 m, dense forest in kloof, 23 March 1994, *P. van Wyk BSA 1980* (PRU!); Sibasa district, at FM tower north of Thengwe, elev. 1,015 m, open to dense woodland, 29 March 1994, *P. van Wyk BSA 1994* (PRU!); next to dirt road between Thengwe and Tshixwadza, elev. 923 m, woodland, 31

March 1994, *P. van Wyk BSA 2019* (PRE!, PRU!); E. Soutpansberg, east of Gundani village towards telecom. aerial, elev. 993 m, 22°38′59″S, 30°35′58″E, low woodland / thicket mosaic, 07 September 2008, *Burrows & Burrows 10604* (BNRH!); E. Soutpansberg, on road from Mufulwi to Tshixwadza, stream before (east of) Tshumulungwi, elev. 993 m, 22°42′34″S, 30°28′53″E, riparian forest, 07 September 2008, *Burrows & Burrows 10610* (BNRH!); E. Soutpansberg, east of Masakadza, unpaved road along ridgetop east of Gundani village, ca. 2 km west of cellphone tower, elev. 989 m, 22°38′55″S, 30°36′16″E, in mixed semi-deciduous woodland, 24 September 2013, *Burrows et al. 13706* (BNRH!, NU!); E. Soutpansberg, road from Mufulwi to Tshumulungwi, elev. 993 m, 22°42′34″S, 30°28′53″E, riparian vegetation along small perennial stream, 24 September 2013, *Burrows et al. 13710* (BNRH!, NU!); E. Soutpansberg, Entabeni pine plantation (Komatiland), edge of pool below waterfall, elev. 1,021 m, 22°53′43″S, 30°22′14″E, riparian forest, 25 September 2013, *Burrows et al. 13712* (BNRH!, NU!); E. Soutpansberg, Mavhuwa to Tshixwadza road, elev. 1,201 m, 22°45′15″S, 30°21′42″E, amongst rocks and shrubs, 28 November 2013, *Burrows & Burrows 13903* (BNRH!, NU!).

**3. *Memecylon natalense*** Markgr. in Mildbraed (1934: 1078) (Figs. 5A, 6A–B)

Holotype:—*Rudatis 149* (B, destroyed). Lectotype (designated here):—**SOUTH AFRICA. KwaZulu-Natal**: Natal-Colony, district Alexandra, station Dumisa, farm Fairfield, elev. 750 m, 15 November 1905, *Rudatis 149* (P! [P00412638]).

≡ *Memecylon australe* Gilg & Schlechter in Schlechter (1907: 94), *nom. illeg.*; not *M. australe* C. Moore in Moore & Betche (1893: 208).

Evergreen shrub or small tree 2–4 (–15) m high; bark light to dark brown, greyish brown or grey, finely longitudinally furrowed; young branchlets slender, subquadrangular; older branchlets terete, whitish grey, longitudinally fissured; nodes thickened; internodes between normal leafy nodes (1.5–) 2–4 (–4.5) mm. Leaves thinly coriaceous, bright green and shining on upper surface, pale green and dull beneath; petioles 2–4 mm long; leaf-blades elliptic-ovate to broadly ovate, (1.4–) 2–4.5 (–5) × (1.5–) 2–3.5 cm, base cuneate, apex acutely acuminate, acumen 1–5 (–10) mm long; midnerve clearly visible, impressed on the upper surface, ± prominent on the lower (especially toward leaf base); one pair of lateral nerves faintly visible on both surfaces; transverse veins ± obscure. Cymes to 2 cm long, 1–4-flowered, mostly axillary and at the intervening 'aphyllous' nodes; peduncles 0.5–5 (–7) mm long; bracts rapidly deciduous. Flowers borne individually at ends of secondary axes, on pedicels 1–3 mm long; hypantho-calyx green, obconic, ca. 2.75 × 3.75 mm, margin sinuate-dentate; lobes broadly rounded to triangular, 0.5–1 × 1.75–2 mm, green or suffused with dark purple; corolla in bud rounded to subacute; petals white, broadly ovate to suborbicular, 5 × 4 mm, apex subacute; staminal filaments 4–7 mm long; anthers dolabriform, ca. 2 mm long, connective white, strongly incurved by the dorsal oil-gland, thecae positioned at anterior end, posterior extremity obtuse; style filiform, ca. 10 mm long, epigynous chamber smooth (interstaminal partitions lacking). Fruits baccate, to 10 mm in diameter, subglobose to ± ellipsoid, green becoming blackish purple at maturity; persistent calycinal crown ca. 1 mm high, lobes erect to spreading.

**Distribution and habitat**:—*Memecylon natalense* is a South African endemic, sporadically distributed in the Eastern Cape and KwaZulu-Natal with some outlying populations in Mpumalanga and Limpopo (Fig. 3). It is found in coastal, scarp and mistbelt forests over a wide elevational range (ca. 60–1,300 m). In the Wolkberg (Limpopo Province), the trees occur at ca. 1,760 m elevation in forest classified as 'Afromontane' (Geldenhuys & Pieterse 1993).

**Etymology**:—The species epithet refers to the type locality in the former colony of Natal (now KwaZulu-Natal Province).

**Phenology**:—Flowers in early October to mid-December; fruits mostly early January to mid-July.

**Conservation status**:—*Memecylon natalense* is known from 19 locations (14 in KwaZulu-Natal, three in Eastern Cape, one in Mpumalanga and one in Limpopo). It has an EOO of 99,683 km$^2$ and an AOO of 104 km$^2$ (assuming a 4 km$^2$ grid-cell size). Because the distribution is highly fragmented, a status of 'Vulnerable' could be justified under criterion B2 if there are significant threats (IUCN 2012). However, roughly half of the known locations are in formally protected areas, including six that are managed by Ezemvelo KZN Wildlife: Umtamvuna Nature Reserve, Oribi Gorge Nature Reserve, Kenneth Stainbank Nature Reserve, Krantzkloof Nature Reserve, Nkandla Forest and Ongoye Forest. The species also receives protection in the Ntendeka Wilderness Area near Vryheid, KwaZulu-Natal (part of the Ngome State Forest managed by DAFF), the Songimvelo Game Reserve near Barberton (managed by the Mpumalanga Tourism and Parks Agency), and the Wolkberg Wilderness Area near Tzaneen (managed by the Limpopo Tourism and Parks Board). One subpopulation is most likely extirpated in Umdoni Park (South Coast of KwaZulu-Natal); the last collection from this site was in 1975, the forest appears now to be degraded, and attempts to rediscover

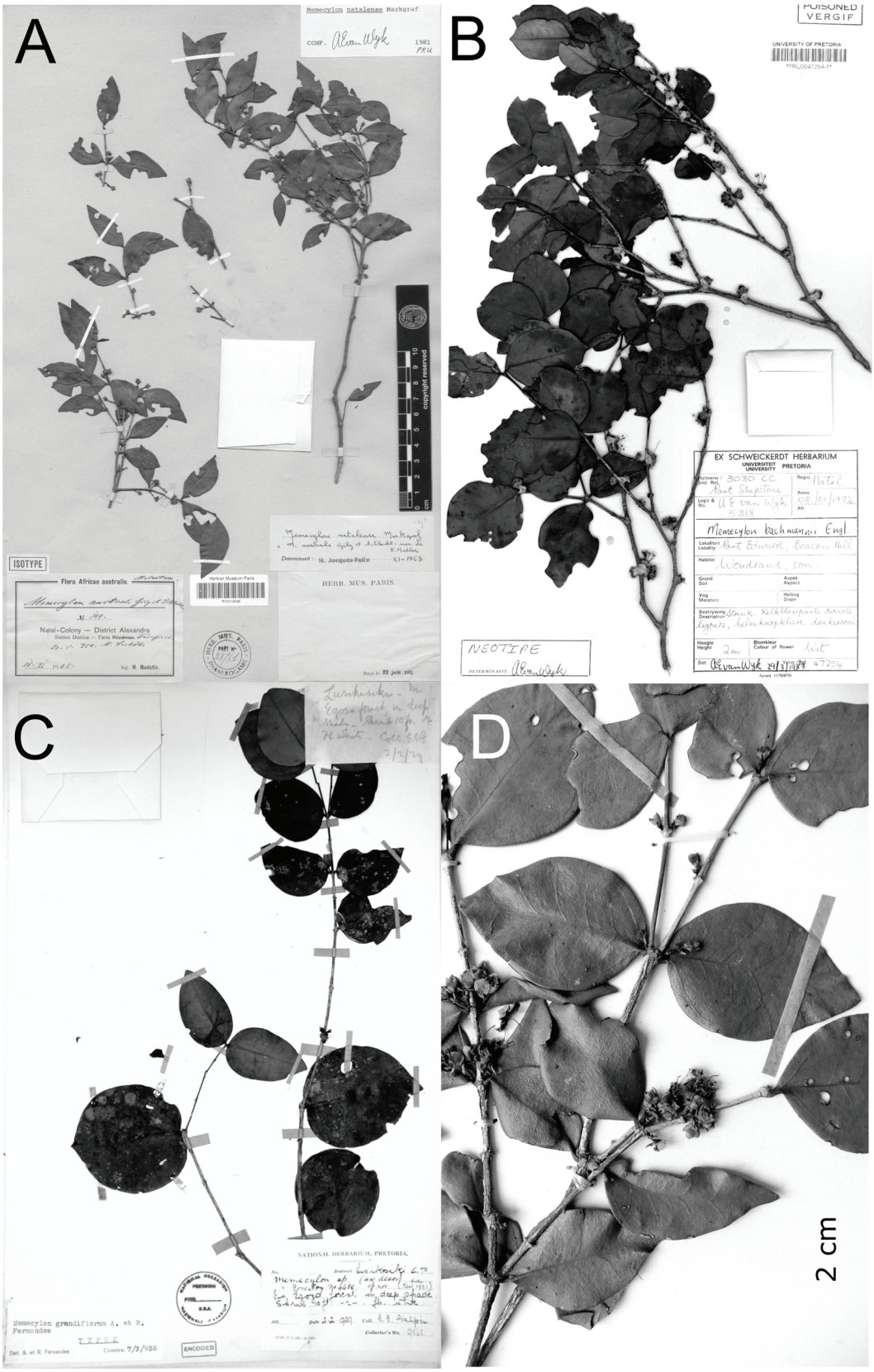


**FIGURE 5. A.** ***Memecylon natalense***, lectotype (*Rudatis 149*, P [P00412638]). **B.** ***Memecylon bachmannii***, neotype (*Van Wyk 5318*, PRU [PRU0047254-1]). **C.** ***Memecylon grandiflorum***, holotype (*Galpin 9568*, PRE). **D.** ***Memecylon australissimum***, part of holotype (*Gordon-Gray s.n.* on 25 November 1971, NU) showing inflorescences and flowers. (**A** from Muséum National d'Histoire Naturelle, Paris. <https://science.mnhn.fr/institution/mnhn/collection/p/item/p00412638>. **B** from H.G.W.J. Schweickerdt Herbarium, University of Pretoria. Photograph in **C** by Lindelwa Khumalo; in **D** by R. D. Stone).

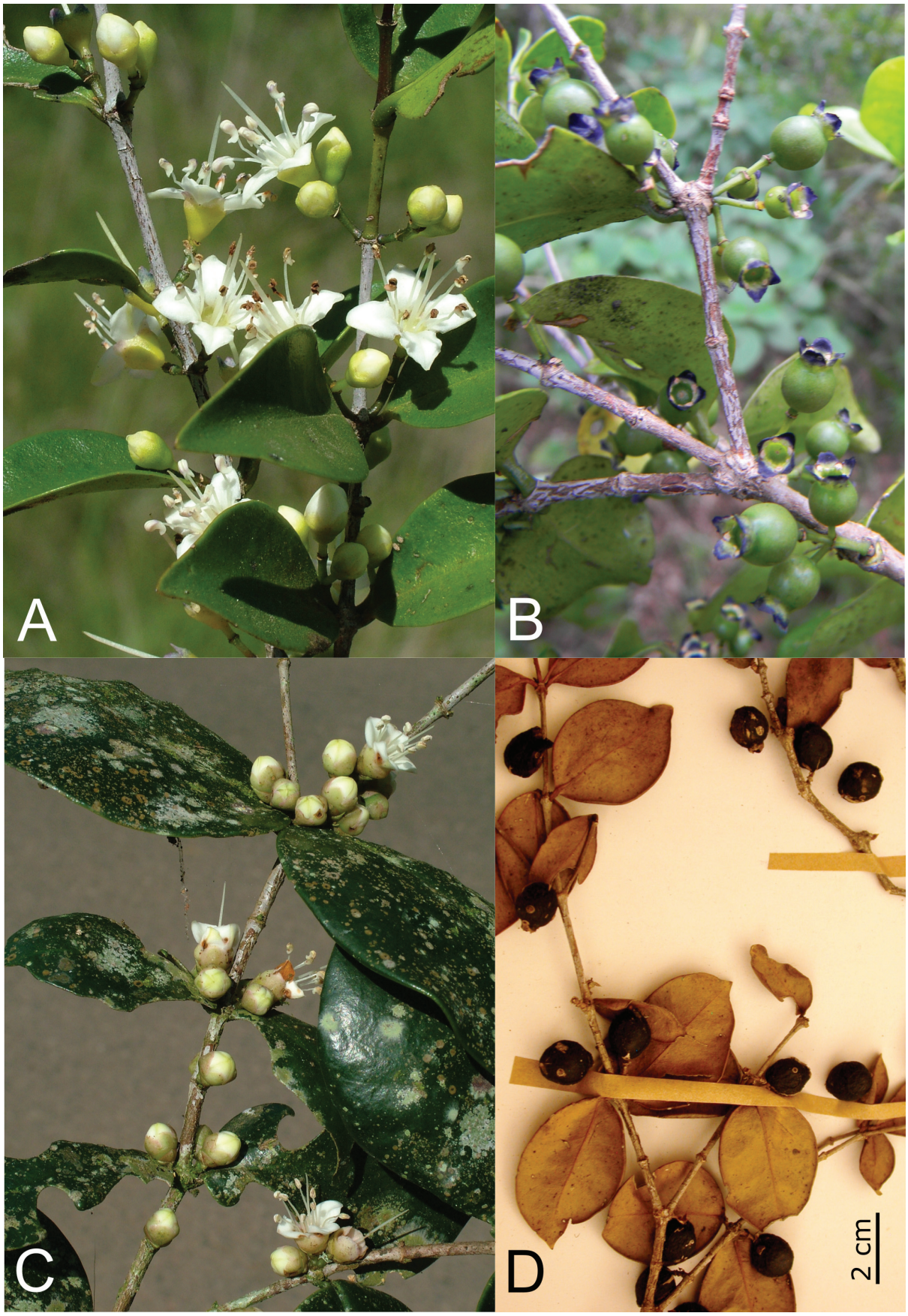


**FIGURE 6. A.** ***Memecylon natalense*** (Oribi Gorge), flowering branch. **B.** ***Memecylon natalense*** (Ongoye Forest), fruiting branch showing calyx-lobes suffused with dark purple. **C.** ***Memecylon bachmannii*** (Everton), flowering branch. **D.** ***Memecylon australissimum*** (Dwesa Nature Reserve), part of *Cooper 290* (NH) showing fruits. Photographs in **A**, **C** by Richard Boon; in **B** by R. D. Stone; in **D** by Lindelwa Khumalo.

the species in 2013–2016 ended in failure. In spite of its limited AOO, we suggest a continued status of 'Least Concern' for *M. natalense*, contingent on the continued effectiveness of conservation measures.

**Discussion**:—The name *M. australe* Gilg & Schltr. was illegitimate when published, being a later homonym of *M. australe* C. Moore, an entirely different species currently known as *Acmena australis* (C. Moore) L.A.S. Johnson (family Myrtaceae). The name *M. natalense* Markgr. was then proposed as a replacement name for *M. australe* Gilg & Schltr. The protologue was based on a specimen (*Rudatis 149*, B) that was evidently destroyed during World War II (Merrill 1943, Hiepko 1987), but a duplicate of this collection was found in P (Van Wyk 1983) and is designated here as the lectotype.

Fernandes & Fernandes (1972, 1978, 1980) later expanded the circumscription of *M. natalense* to include not only the South African plants but also some collections from inselbergs of northern Mozambique and southern Malawi (Mt Mulanje). These northerly populations are indeed morphologically similar to *M. natalense* but were recently placed in a separate species, *M. nubigenum*, based on nrDNA results indicating they are not closely related to *M. natalense* sensu stricto (Stone *et al.* 2017a, 2017b).

In the present treatment, *M. natalense* is a South African endemic and excludes plants from the Soutpansberg (Limpopo Province) described as *M. soutpansbergense*, as well as plants from the Hluleka and Dwesa-Cwebe nature reserves (Eastern Cape) described as *M. australissimum*. The geographic range of *M. natalense* partially overlaps that of *M. bachmannii* in southern KwaZulu-Natal and the adjacent Eastern Cape, and the nrDNA spacer sequences of these two species are identical or nearly so (Stone *et al.* 2017a). However, *M. natalense* is readily distinguished from *M. bachmannii* by its smaller, distinctly petiolate, ovate-acuminate, basally cuneate leaves (vs leaves larger, subsessile, broadly ovate to suborbicular, and basally rounded to subcordate); cymes to 2 cm long on peduncles to 7 mm (vs cymes <1 cm long on peduncles to 4 mm); bracteoles rapidly deciduous (vs persistent); smaller flowers (5–7 mm in diameter with petals 5 × 4 mm vs 10 mm in diameter with petals 6 × 6 mm); and fruits subglobose (vs ovate). These two species also differ in their respective habitat preferences and flowering periods (Stone *et al.* 2017a), although there is again some overlap, and both species are occasionally found growing together in the same forest. Some plants of *M. natalense* have calyx-lobes suffused with a dark purple colour, although this is evidently not a consistent feature amongst all populations and thus cannot be considered diagnostic.

**Additional specimens examined**:—**SOUTH AFRICA. Eastern Cape:** E. Pondoland, Egossa [Egosa], August 1899, *Sim 2473* (PRE!); Hlolweni 'S' bends, dry forest, 25 April 1985, *Abbott 2589* (NH!, PCE!, PRU!); Mbotyi–Ntsubane forest, elev. 300 m, 24 May 1986, *Abbott 3147* (NH!, PCE!, PRU!); Lusikisiki district, Lupatana [Luphuthana], forest, 10 December 1986, *Van Wyk & Mathews 7935* (M!, NH!, PRU!); Mpahlane River, elev. 75 m, riverine forest, 22 April 2004, *Abbott 8058* (PCE!, PRU!); Lusikisiki district, Ntsubane–Mbotyi road just above the hairpin bend, elev. 225 m, 31°26′28.3″S, 29°43′51.5″E, dense coastal scarp forest, 15 December 2016, *Stone et al. 2803* (NU!); same locality, elev. 199 m, 31°26′34.7″S, 29°43′55.9″E, 09 December 2017, *Stone & Amarasinghe 2830* (NU!); Luphuthana River drainage, elev. 116 m, 31°24′31.3″S, 29°50′32.5″E, in degraded forest along small tributary stream, 10 December 2017, *Stone & Amarasinghe 2834* (NU!).

**KwaZulu-Natal**: 'Natal', s. loc., s. d., *Gerrard 1646* (K!); Westville, 02 November 1893, *Medley-Wood 5232* (K!, NH!); Westville, elev. 150 m, November 1893, *Evans 589* (NH!); South Coast, 15 July 1923, *Pole-Evans 786* (K!, PRE!); Zululand, Ngome forest, Ngotshe district, 08 May 1944, *Gerstner 4497* (PRE!); Eshowe district, Ngoye [Ongoye] Forest, elev. ca. 400 m, 16 February 1961, *Edwards 2488* (NU!, PRE!); Mtunzini district, Ngoya [Ongoye] forest, 16 February 1961, *Wells & Edwards 15* (K!, NH!, NU!, PRE!); Vryheid district, Ngome Forest, elev. 1,100 m, 10 February 1962, *Edwards 2711* (EA!, K!, NU!, PRE!, WAG!); same locality, 10 February 1962, *Edwards 2715* (K!); Kloof [Krantzkloof] Nature Reserve, elev. 300 m, forest, 16 February 1966, *Moll 3025* (K!, PRE!); Pinetown district, Krantzkloof Nature Reserve, elev. 460 m, forest, 16 August 1966, *Moll 3297* (PRE!); same locality, 17 August 1966, *Moll 3305* (PRE!); same locality, 18 August 1966, *Moll 3313* (K!, MO!, PRE!); Umzinto district, Umdoni Park, in forest, 15 April 1968, *Cooper 42* (NH!, PRE!); Kloof, cult. in Mr. Butcher's garden from seed collected above krantzes in Kloof [Krantzkloof] Nature Reserve, 06 December 1968, *Bayer 6285* (K!, NH!, PRE!); Ngoye [Ongoye] forest, south fringe, elev. 300 m, scrub forest, 11 December 1968, *Codd 10719* (K!, PRE!); Ngoye [Ongoye] forest, 11 December 1968, *Ross 1867* (EA!, K!, NH!, PRE!); Mr. Butcher's garden, Wyebank, grown from seed collected at Krantzkloof Nature Reserve, 23 January 1969, *Ross 1890* (K!, NH!, PRE!); Krantzkloof Nature Reserve, 23 January 1969, *Ross 1891 & 1893* (EA!, K!, NH!, PRE!, WAG!); Kloof, in Mr R.R. Butcher's garden, 03 March 1969, *Bayer 6285a* (PRE!); Umdoni Park, forest off edge of fairway 13, 30 March 1969, *Jarman & Guy 193* (NU!); Port Shepstone district, Mgongongo, kloof forest, 30 March 1969, *Strey 8453* (NH!); Ngoye [Ongoye] forest, 02 August 1969, *Ross 2120* (EA!, K!, NH!, PRE!); Kloof [Krantzkloof] Nature Reserve, elev. 550 m, forest margin, 05 October 1969, *Bayer 6286* (EA!, K!, M!, NH!, NU!, PRE!, S!); Ngoye [Ongoye] Forest, 01 November 1969, *Garland 453* (PRE!); same

locality, 23 November 1969, *Garland* s.n. (PRE!); Kloof [Krantzkloof] Nature Reserve, elev. 550 m, 08 January 1970, *Bayer 6827* (E!, EA!, K!, M!, NH!, PRE!, S!, WAG!); Krantzkloof, 16 March 1970, *Bayer* s.n. (PCE!); Oribi Nature Reserve, Mfezi Path, forest, 21 July 1970, *Moll 5025* (K!, NH!, PCE!, PRE!); Oribi Nature Reserve, forest near Hoopoo [Hoopoe] Falls, 23 July 1970, *Moll 5041* (K!, NH!, PCE!, PRE!); Oribi, February 1971, *Davidson 1577* (PCE!); Ngoye [Ongoye] Forest margin, elev. ca. 600 m, 05 March 1972, *Moll 5625* (K!, NH!; PCE!, PRE!); Ngoye [Ongoye] Forest, elev. ca. 300 m, 04 June 1972, *Moll & Müller 5672* (K!, NH!, PRE!); Port Shepstone district, Umdoni Park, in woud, 10 December 1975, *Van Wyk & Venter 1376* (PRU!); Mtunzini, 'Twinstreams', December 1975, *Garland* s.n. (NU!); 'The Rocks', 12 April 1978, *Nicholson* s.n. (PCE!); Oribi Gorge, along view point walk, in forest, 02 June 1978, *Van Wyk 2339* (PRU!); Farm 'The Rocks' near Oribi Gorge, elev. 300 m, in forest along cliffs, 10 October 1978, *Nicholson 1878* (PCE!, PRE!); Oribi Bridge, 09 November 1978, *Nicholson* s.n. (PCE!); 'The Rocks', Izingolweni, elev. 300 m, in forested gorge above the cliffs, 13 December 1978, *Nicholson 1910* (PCE!, PRE!); Oribi Gorge Nature Reserve, Hell's Gate Gorge, elev. 300 m, densely forested area, 12 January 1979, *Nicholson 1918* (PRE!); Olympus Kloof, April 1979, *Nicholson* s.n. (PCE!); Oribi Gorge Nature Reserve, langs viewpoint wandelpad, 15 July 1979, *Van Wyk 2627* (K!, PRU!); Uvongo, Ngongongo kloof, naby pad na Gamalakhe, 11 December 1979, *Van Wyk 3288* (PRE!, PRU!); Umtamvuna Nature Reserve, Gogosa Kloof, forest, 06 October 1984, *Abbott 2175* (NH!, PCE!, PRU!); Zululand, Ngoye [Ongoye] Forest, 11 October 1984, *Lowrey & Van Wyk 1020* (PRU!); same locality, 12 October 1984, *Lowrey & Van Wyk 1043* (NH!, PRU!); Ngome staatsbos, Ntendeka wildernisgebied, woudrand, 04 December 1985, *Van Wyk 6985* (PRE!, PRU!); Nkandla Forest Reserve, 03 April 1986, *Van Wyk 7332* (PRU!); S. Coast, Paddock, Kranskloof 8100 [farm], elev. ca. 300 m, forest, 24 June 1987, *Heywood 110* (PCE!); Nqutu Falls, Krantzkloof, riverine forest, 17 September 1987, *Jordaan 1168* (NH!); Krantzkloof Nature Reserve, Nqutu Kloof, short shrub forest, edge of gorge, 17 September 1987, *Van Wyk 8117* (NH!, PRU!); Inanda District, Matabetule Plateau, Mzinyati Nature Reserve, 18 September 1987, *Van Wyk 8159* (NH!, PRU!); Umhlatuzana River, Stainbank Nature Reserve, 28°52′30″S, 31°37′30″E, river bank, 18 November 1994, *Nichols* s.n. (NH!); Thuthwini district, Ntimbankulu/Dweshula village, near foot path to Mabheleni, through Ntimbankulu Forest, 30°37′30″S 30°22′30″E, 24 May 2001, *Ngwenya 2327* (NH!); Krantzkloof Nature Reserve, forest in ravine accessed from Watsonia Place, 16 February 2003, *Styles 1584* (NU!); Ngome, Ntendeka Wilderness Area, evergreen forest at campsite, 11 June 2006, *Burrows & Burrows 9466* (BNRH!); Oribi, Lake Eland Game Reserve, elev. 587 m, dry krans thicket, 16 November 2006, *Abbott 8546* (PRU!); Lake Eland Game Reserve, along foot path near suspension bridge below north rim of Oribi Gorge, elev. 587 m, 30°43′12.4″S, 30°11′14.5″E, 23 January 2009, *Stone et al. 2690* (NU!); Kenneth Stainbank Nature Reserve, Durban, forest understorey along Red Trail and above south bank of Umhlatuzana River, 04 July 2013, *Stone & Cassimjee 2764* & *2765* (NU!); Krantzkloof Nature Reserve, northern edge of Molweni gorge near lower Bridle Road viewpoint, elev. 460 m, 29°46′12″S, 30°50′10″E, upper reach of ravine forest, 05 July 2013, *Stone et al. 2767* (NU!); Ngome State Forest, near designated camping site and along Forest Walk, 08 July 2013, *Stone et al. 2768*, *2769* & *2770* (NU!); Vulamehlo local municipality ca. 26.2 km WSW of Umzinto, near Moyeni Farm in scarp forest overlooking the Mtwalume River, elev. 725 m, 30°20′13″S, 30°23′26″E, 12 July 2013, *Stone et al. 2771* (NU!); ca. 25 km NW of KwaDukuza [Stanger], Mapumulo escarpment south of Tugela River, elev. 792 m, 29°11′15.2″S 31°06′30.0″E, remnant forest patch, 25 October 2014*, Styles 4877* (NU!); Ongoye forest ca. 15 km inland from Mtunzini, 17 July 2015, *Stone et al. 2788* & *2789* (NU!); Ongoye Forest ca. 15 km inland from Mtunzini, elev. 375 m, 28°49′37.6″S, 31°44′34.8″E, 07 December 2016, *Stone et al. 2793* & *2794* (NU!); Kenneth Stainbank Nature Reserve, Durban, forest understorey along Red Trail above Umhlatuzana River, elev. 70 m, 29°54′13.4″S, 30° 56′31.0″E, 17 November 2017, *Stone & Amarasinghe 2808* & *2808a* (NU!); Oribi Gorge Nature Reserve, along foot trail to Hoopoe Falls, in forest on north side of Umzimkulwana River near its confluence with Mbabala stream, elev. 274 m, 30°43′01.4″S, 30° 15′28.9″E, 20 November 2017, *Stone & Amarasinghe 2810* (NU!); Oribi Gorge Nature Reserve, in forest along Mziki trail, 21 November 2017, *Stone & Amarasinghe 2812* & *2813* (NU!); Umtamvuna Nature Reserve near Gogosa outpost, elev. 488 m, 30°54′20.6″S, 30°08′53.8″E, kloof forest, 23 November 2017, *Stone et al. 2817* (NU!); ca. 9 km SW of Dumisa, near Moyeni farm, scarp forest overlooking the Mtwalume River, 24 November 2017, *Stone & Amarasinghe 2820* & *2821* (NU!); Ongoye forest ca. 15 km inland from Mtunzini, elev. 390 m, 28°49′37.0″S, 31° 44′35.2″E, edge of low forest on south-facing slope below granitic outcrop on ridge-top, 28 November 2017, *Stone & Amarasinghe 2822* (NU!); Nkandla Forest Reserve, elev. 1080 m, 28°44′50.9″S, 31°09′39.9″E, in mist-belt forest along footpath below ridgetop, 29 November 2017, *Stone & Amarasinghe 2825* (NU!); Krantzkloof Nature Reserve, northern edge of Molweni gorge near lower Bridle Road viewpoint, ravine forest, 02 December 2017, *Stone & Amarasinghe 2827* & *2828* (NU!).

**Mpumalanga:** Barberton Mts, Bearded Man, elev. 1,260 m, 25°44.79′S, 31°18.72′E, forest understorey, 11 October 2000, *Lötter 893* (BNRH!); Barberton Mts., Songimvelo Nature Reserve, Bearded Man, elev. 1,400 m, evergreen mist-forest, 16 April 2005, *Burrows & Lötter 8936* (BNRH!); Barberton Mts, Songimvelo Nature Reserve, Bearded Man,

on border of Swaziland above Satico gum tree plantation, in shade of evergreen afrotemperate forest (cloud forest) on south-facing slope of ridgecrest, 26 September 2013, *Burrows et al. 13720*, *13721*, *13722* & *13723* (BNRH, NU!); Barberton Mts, Songimvelo Nature Reserve, Bearded Man, elev. 1,270 m, 25° 44′45.4″S, 31°18′45.1″E, 04 December 2017, *Burrows et al. 15259* (BNRH).

**Limpopo:** Wolkberg Wilderness Area, farm Wolkberg 634 LT, elev. 1,760 m, occasional at waterfall, 23 October 1985, *Venter 11081* (NU!); same locality, occasional in Wonderwoud, 23 October 1985, *Venter 11149* (MO!, NU!).

**4. *Memecylon bachmannii*** Engler (1921: 768) (Figs. 5B, 6C)

Holotype:—not specified (B, destroyed). Neotype (designated by Van Wyk 1983: 173).—**SOUTH AFRICA. KwaZulu-Natal**: Port Edward, Beacon Hill, woudrand, 08 January 1982, *Van Wyk 5318* (PRU! [PRU0047254-1]; isoneotypes K! [K000313570], NH! [NH0075786-0], NU! [NU0015538-0], PRE! [PRE0626741-0], PRU! [PRU0047254-2, PRU0047254-3]).

= *Memecylon grandiflorum* A. Fernandes & R. Fernandes (1955: 63, *tab. XVII*)

Type:—**SOUTH AFRICA. Eastern Cape**: Lusikisiki district, Egoza [Egosa] forest, in deep shade, 02 February 1929, *Galpin 9568* (holo- PRE!, iso- K! [K000313569]) (Fig. 5C).

Evergreen shrub or small tree 2–8 m high; bark pale brown or grey, finely longitudinally fissured; young branchlets terete to subquadrangular, new growth pale green to bronze or shiny dark purple; older branchlets terete, whitish grey, longitudinally fissured; nodes thickened; internodes between normal leafy nodes (2.5–) 4–8.5 (–10) cm. Leaves stiffly coriaceous, dark green and glossy above, pale green and dull below, subsessile (petioles 0.5–1 mm long); blades broadly ovate to ± suborbicular, (3.5–) 5.4–8.5 (–10) × (3.7–) 4–7.5 (–9) cm, base broadly rounded to subcordate (rarely cuneate), apex rounded then abruptly short-acuminate, acumen 2–4 (–6) mm long; midnerve clearly visible, impressed on upper surface, ± prominent on lower surface (especially toward leaf base); one pair of lateral nerves faintly visible on both surfaces; transverse veins 4–5 pairs, faintly visible, oblique relative to midnerve, ± prominent on upper surface in dried material. Cymes to 1 cm long, 1–3-flowered, solitary or in fascicles of 2 at the defoliated nodes of older branchlets, in the leaf axils and at the intervening 'aphyllous' nodes; peduncle compressed, to 4 mm long, apex dilated, bibracteate; secondary axes to 1.5 mm long. Flowers borne individually at ends of inflorescence axes, sessile (true pedicels absent), each flower closely subtended by 3 pairs of opposite-decussate, persistent bracteoles; lower bracteoles 2.5 × 2 mm, dorsally keeled, apex acuminate; median bracteoles broadly ovate-cordiform, 4 × 4 mm, also dorsally carinate; upper bracteoles ± clasping the base of the hypantho-calyx, 4 × 5.5 mm; hypantho-calyx green, cupuliform, ca. 3.5 × 5.5 mm; calyx-lobes subsemiorbicular, 3 × 5 mm, apex rounded; corolla in bud broadly rounded; petals white, broadly ovate to suborbicular, 6 × 6 mm, apex broadly rounded to obtuse or abruptly short-acuminate; staminal filaments ca. 8 mm long; anthers dolabriform, ca. 2.5 mm long, connective white, strongly incurved by the dorsal oil-gland, thecae positioned at anterior end, posterior extremity obtuse; style 12 mm long; epigynous chamber not seen (concealed by the incurved, persistent calyx-lobes). Fruits baccate, ovoid, ca. 10 × 8 mm, green becoming dark purple when ripe.

**Distribution and habitat**:—Endemic to the coastal region of Pondoland (Eastern Cape and adjacent southern KwaZulu-Natal; Van Wyk 1990, Van Wyk & Smith 2001), with an isolated location in the Molweni kloof just inland of Durban (Fig. 3). Habitat in shaded understorey of scarp forest at 25–550 m elevation.

*Memecylon bachmannii* is frequently encountered from near Port Shepstone southward to Lusikisiki, and its occurrence in this region is highly correlated with a ± continuous surface outcrop of Msikaba Formation sandstone (Busakwe 2015, Council for Geoscience 2018). Local populations are ± isolated from one another, being restricted to a series of forested river gorges separated by areas of unsuitable habitat (grassland-covered plateaux). Further south, in the vicinity of Port St Johns, the species is seemingly rare, since several occurrences documented by previous collections could not be relocated during field-work in 2015–2017.

**Etymology**:—The species epithet honours German doctor and naturalist F.E.T. Bachmann (1850–1937) who likely made the first collection of *M. bachmannii*, although no specimens were cited in the protologue.

**Phenology**:—Flowers in mid-December to mid-February; fruits mostly January to September.

**Conservation status**:—*Memecylon bachmannii* is known from 18 locations (including 14 in the Eastern Cape and four in southern KwaZulu-Natal). It has an EOO of 8,751 km$^2$ and an AOO of ca. 120 km$^2$ (assuming a 4 km$^2$ grid-cell size). Because the distribution is highly fragmented, a status of 'Vulnerable' could be justified under criteria B1 and B2 if there are significant threats (IUCN 2012). However, several of the known locations are in formally protected areas, including the Mkambati (Mkhambathi) and Silaka nature reserves (managed by Eastern Cape Parks), the Mthambalala State Forest (managed by DAFF), and the Umtamvuna, Oribi Gorge and Krantzkloof nature reserves

(managed by Ezemvelo KZN Wildlife). Even outside of these formally protected areas, many occurrences receive *de facto* protection in kloofs and river gorges that are difficult of access and unaffected by wood harvesting or grassland fires. In spite of its limited EOO and AOO, we suggest a continued status of 'Least Concern' for *M. bachmannii*, contingent on the continued effectiveness of conservation measures.

**Discussion**:—The protologue of *M. bachmannii* was presumably based on material housed in B and later destroyed during World War II (Merrill 1943, Hiepko 1987). No duplicates have been found in other herbaria, including KIEL where Bachmann's collections are mainly deposited (Dr Martin Nickol, pers. comm., 29 November 2018). We thus follow Van Wyk's (1983) neotype designation for *M. bachmannii*, as well as his treatment of *M. grandiflorum* as a taxonomic (heterotypic) synonym of *M. bachmannii*. The type of *M. grandiflorum* has nearly orbicular leaves, but this form occurs sporadically throughout the geographic range of *M. bachmannii* (e.g., at Egosa, Khebenge, Umtamvuna, Oribi Gorge, and near Paddock) and appears to be part of the normal range of variation.

*Memecylon bachmannii* is clearly distinguished from *M. natalense* by its larger, subsessile, broadly ovate to suborbicular, basally rounded to subcordate leaves (vs leaves smaller, distinctly petiolate, ovate-acuminate and basally cuneate); cymes <1 cm long on peduncles to 4 mm (vs cymes to 2 cm long on peduncles to 7 mm); bracteoles persistent (vs rapidly deciduous); larger flowers (10 mm in diameter with petals 6 × 6 mm vs 5–7 mm in diameter with petals 5 × 4 mm); and fruits ovate (vs subglobose).

*Memecylon bachmannii* differs from *M. australissimum* by its larger, subsessile leaves (blades mostly 5.4–8.5 × 4–7.5 cm, broadly ovate to ± suborbicular and basally rounded to subcordate vs blades mostly 3.5–4.5 × 3–3.5 cm, broadly elliptic to broadly ovate and basally cuneate to rounded, petioles short but distinct, 1–3 mm), larger flowers (10 mm in diameter with petals 6 × 6 mm vs. ca. 7 mm in diameter with petals 3 × 3 mm), and larger fruits (10 × 8 mm vs ca. 7 × 5 mm).

**Additional specimens examined**:—**SOUTH AFRICA**. **Eastern Cape**: E. Pondoland, Egossa [Egosa], August 1899, *Sim 2482* (PRE!); Lusikisiki district, Mkondoulotini Forest, December 1922, *Miller 166* (PRE!); Ngqeleni district, Mpimbo Forest, November 1923, *Miller* in Herb. Forestry *5439* (PRE!); Lusikisiki district, Mkambati Leper Inst., Umsikaba River near [its] mouth, forest in narrow deep kloof, 08 September 1956, *Marais 1182* (PRE!); Lusikisiki district, Magwa Falls, river[ine] forest, 14 July 1966, *Strey 6723* (K!, NH!, PRE!); Lusikisiki district, Magwa Falls, forest margin on banks of watercourse, elev. ca. 400 m, 14 July 1966, *Ward 5792* (NH!, NU!, PRE!, UDW!); 3129BD (Port St. Johns), s. loc., 22 May 1970, *Jenkins* s.n. (K!, PRE!); Goss Point, riverine forest understorey, 10 November 1970, *Strey 10154* (E!, K!, NU!, PCE!, PRE!, WAG!); Lusikisiki, Magwa-waterval, 10 December 1975, *Van Wyk & Venter* 1349 (PRU!); Ntsubane, Fraser Gorge, Mkozi stroom, 11 July 1976, *Van Wyk 1579* (PRU!); Ntsubane, 11 July 1976, *Venter 877* (PRE!); Mtentu River gorge, 2 km upstream from mouth, 10 December 1978, *Cooper 257* (BR!, K!, MO!, PRE!); Lusikisiki district, Khebenge [Kebenge], elev. 400 m, forest, 09 February 1982, *Cawe 174* (PRU!); Ntsubane, Fraser's Gorge, woud, 09 October 1982, *Van Wyk & Kok 5866* & *5868* (PRU!); ± 4 km vanaf Ntsubane na Mbotyi, woud, 09 October 1982, *Van Wyk & Kok 5874* (PRU!); Lusikisiki district, Mlambomkulu River just where it exits from the Isicezula Forest, forest margin, 04 December 1986, *Van Wyk & Matthews 7724* (NH!, PRU!); Isicezula Forest, bordering Mazizi Tea Estate, along main southern tributary of Mlambomkulu River, 08 December 1986, *Van Wyk & Matthews 7851* (MO!, NH!, PRU!); Port St. Johns, Lusikisiki district, Mkweni River, ± 1.5 km upstream from the sea, forest, 09 December 1986, *Van Wyk & Matthews 7883* (MO!, NH!, PRU!); Umtentu River, north banks ±1 km inland, outside reserve, forest, 10 December 1986, *Jordaan 964* (NH!, PRE!); Ntafufu, Mtambalala Forest Station, 12 December 1986, *Van Wyk & Matthews 7975* (NH!, PRU!); Mkambati Nature Reserve, Daza River, 13 December 1986, *Jordaan 1071* (NH!, PRE!); Port St. Johns, Mount Thesinger [Thesiger], forest near summit, 03 August 1988, *Van Wyk 8375* (PRU); Port St. Johns, Mount Sullivan, forest margin, 12 April 1990, *Van Wyk 10051* (PRU!); upper Bulawa Forest near Mpande, 22 June 1990, *Cooper 261* (G!, NH!, PRE!); Hlolweni River Gorge, 30°59′56.4″S 30°08′24″E, dense riverine woodland, 13 December 1993, *P. van Wyk BSA 1601* (PRU!); Hlolweni River at junction with Icwaka, elev. 250 m, 15 December 1994, *Abbott 6635* (PRU!); valley of NE tributary of the KwaDlambu in Tracor land, inland of the Superbowl, elev. 140 m, 27 April 1999, *Abbott 7668* (PCE!, PRU!); Magwa Gorge, accessed through Magwa Tea Estate, in forest on sandstone, 16 April 2002, *Styles et al. 898* (NU!); south side of Umtamvuna forest, 2 km upstream from old Pont Holiday Resort, opposite Leopard Beach, 19 August 2003, *Brand & Abbott 623* (NY!); Magwa Falls, right bank of Mzizangwa River just upstream of falls, elev. 400 m, riverine forest, 10 June 2015, *Stone & Tenza 2781* & *2782* (NU!); Silaka Nature Reserve, rocky ground on right bank of Gxwaleni River, elev. 50 m, 31°38′56.7″S, 29°30′01.6″E, forest understorey, 12 June 2015, *Stone 2785* (NU!); Ntsubane–Mbotyi road, understorey of dense coastal scarp forest, 15 December 2016, *Stone et al. 2804* & *2805* (NU!); north side of Mthentu River ca. 1 km inland from its mouth, elev. 29 m, 31°14′32.9″S, 30° 02′26.7″E, dense forest patch, 22 November 2017, *Stone & Amarasinghe 2816* (NU!); north side of Mkweni River ca. 1 km inland from its mouth, in forest on rocky south-facing

slope, 09 December 2017, *Stone & Amarasinghe 2831 & 2832* (NU!); Mazize forest, north side of road to Cutweni bordering Mazizi tea estate, elev. 454 m, 31°24′ 04.4″S, 29°43′49.6″E, 09 December 2017, *Stone & Amarasinghe 2833* (NU!); Luphuthana River drainage, in forest along small tributary, 10 December 2017, *Stone & Amarasinghe 2835 & 2836* (NU!); Mkambati Nature Reserve, in forest on north side of Msikaba River mouth, elev. 24 m, 31°19′03.7″S, 29°58′00.5″E, 11 December 2017, *Stone & Amarasinghe 2837* (NU!).

**KwaZulu-Natal**: Port Shepstone district, Holgate's Farm, Paddock, kloof forest, 06 August 1965, *Strey 5888* (K!, M!, NH!, NU!, PRE!, UDW!); Port Shepstone district, Farm Excelsior, Paddock, kloof forest, 20 December 1965, *Strey 6198* (K!, NH!); Port Shepstone district, Beacon Hill, ravine forest, 02 April 1966, *Strey 6502* (EA!, K!, MO!, NH!, NU!, PRE!, UDW!); Umtamvuna River tributary, 03 April 1966, *Nicholson 331* (NH!); upper Umtamvuna River, streambed forest, 03 April 1966, *Nicholson 338* (NH!); Beacon Hill, 03 April 1966, *Nicholson* s.n. (PCE!); Port Shepstone district, Ixotsha [Izotsha] upper region, kloof forest, 30 December 1966, *Strey 7173* (K!, NH!, NU!, PRE!); Umtamvuna River gorge?, 'plot 8 cliffs above & below,' 25 November 1968, *Nicholson* s.n. (PCE!); Port Edward, near Beacon Hill farm, in forest on steep N. bank of Umtamvuna River, elev. 250 m, 10 December 1968, *Codd 10714* (NH!, PRE!); Pinetown district, Everton, Eskotene, Molweni Kloof, below summit cliffs in forest, 11 January 1970, *Hilliard 4898* (E!, NH!, NU!); Beacon Hill Farm, 19 November 1970, *Nicholson* s.n. (PCE!); edge of Baboon spruit, Oribi, February 1973, *Davidson 2406* (PCE!); Drower's plot forest area, Oribi, 15 February 1973, *Davidson 2596* (PCE!); Umtamvuna Nature Reserve, 28 August 1973, *Nicholson* s.n. (PCE!); Umtamvuna Nature Reserve near Port Edward, 01 July 1974, *Nicholson 1462* (PCE!, PRE!); Port Edward, Beacon Hill west, kloofwoud, 11 December 1979, *Van Wyk 3285* (PRU!); Port Edward, Beacon Hill, woud, 23 February 1980, *Van Wyk 3628* (PRU!); Port Shepstone district (3030 CC), s. loc., against krans face in forest, 18 March 1982, *Abbott 49* (PRU!); Umtamvuna Nature Reserve, high forest, 29 December 1983, *Abbott 1589* (PCE!, PRU!); Umtamvuna Nature Reserve, Bulolo north of office, 29 April 1984, *Abbott 1947* (NH!, PCE!, PRU!); Umtamvuna Nature Reserve, Smedmore area, 'Outeniqua' trail, elev. 400 m, forest, 06 December 1984, *Balkwill & Cadman 2325* (E!); Umtamvuna River Gorge, under tall cliff forest on slopes above gorge, 20 December 1984, *Nicholson 2420* (NH!, PCE!); Umtamvuna, radio beacon, forest, 25 January 1985, *Abbott 2490* (PCE!, PRU!); Umtamvuna Nature Reserve, coastal forest, 11 April 1987, *Cunningham 2495* (NU!); Umtamvuna Nature Reserve, Smedmore Forest adjoining reserve, elev. 400 m, 04 September 1994, *P. van Wyk BSA 2577* (NH!, PRU!); Umtamvuna Nature Reserve, 31°00′40″S, 30°10′4″E, forest in gorge, 08 March 2001, *Gavhi et al. 30* (BR!); Krantzkloof Nature Reserve, in ravine equidistant between Watsonia Place and Bridle Road viewpoint, forest, 14 February 2003, *Styles 1579* (NU!); Oribi Gorge Nature Reserve, Mziki Trail, forest, 21 September 2003, *Styles 1573* (NU!); Umtamvuna Nature Reserve, along Fish Eagle Trail below Clearwater Rest House, forest, 21 January 2009, *Stone & Potgieter 2688 & 2689* (NU!); Umtamvuna Nature Reserve, Fish Eagle Trail, elev. 111 m, 31°03′10″S, 30°10′03″E, 23 March 2010, *Abbott 9150* (BNRH!); Everton, upper Molweni River drainage just above where crossed by Acutts Drive, elev. 550 m, 29°46′34″S, 30°48′18″E, 05 July 2013, *Stone et al. 2766 & 2766a* (NU!); Umtamvuna Nature Reserve, along Fish Eagle Trail below Clearwater Rest House, elev. 135 m, 31°02′37.9″S, 30°09′55.2″E, forest, 19 November 2017, *Stone & Amarasinghe 2809* (NU!); Oribi Gorge Nature Reserve, in forest along Mziki trail, elev. 500 m, 21 November 2017, *Stone & Amarasinghe 2814 & 2815* (NU!); Umtamvuna Nature Reserve, near Gogosa outpost, elev. 483 m, 30°54′02.8″S, 30° 08′53.7″E, kloof forest, 23 November 2017, *Stone et al. 2818* (NU!); Everton, upper Molweni River drainage just above where crossed by Acutts Drive, elev. 523 m, 29° 46′23.3″S, 30°48′21.6″E, forest on south-facing slope, 02 December 2017, *Stone & Amarasinghe 2826* (NU!).

**5. *Memecylon australissimum*** R.D.Stone & I.G.Mona, *sp. nov.* (Figs. 5D, 6D, 7)

Type:—SOUTH AFRICA. Eastern Cape: Gwibi [Cwebe] Forest, near Bashee [Mbhashe] River mouth, 25 November 1971, *Gordon-Gray* s.n. (holotype NU!, isotype PRE! [accession no. 51136]).

Evergreen shrub or small tree 2–4.5 m tall; bark finely longitudinally fissured; branchlets of new growth slender, quadrangular above 'aphyllous' node, terete below; older branchlets subquadrangular to terete, whitish grey, longitudinally fissured; nodes thickened; internodes between normal leafy nodes 2.5–3.5 (–5) cm. Leaves subcoriaceous, dark green and glossy above, pale green and dull below; petioles 1–3 mm long; blades broadly elliptic to broadly ovate, 3.5–4.5 (–5.5) × (2.5–) 3–3.5 (–4) cm; base cuneate to rounded; apex ranging from acute to acuminate-acute or acuminate-obtuse, acumen 3–4 (–5) mm long; midnerve clearly visible, impressed on upper surface, ± prominent on lower (especially toward the leaf base); one pair of lateral nerves faintly visible on both surfaces; transverse veins 4–5 pairs, faintly visible, oblique relative to the midnerve, ± prominent on both adaxial and abaxial surfaces in dried material. Cymes 1–3-flowered, solitary or in fascicles of 2–3 at the defoliated nodes of older branchlets, in the leaf

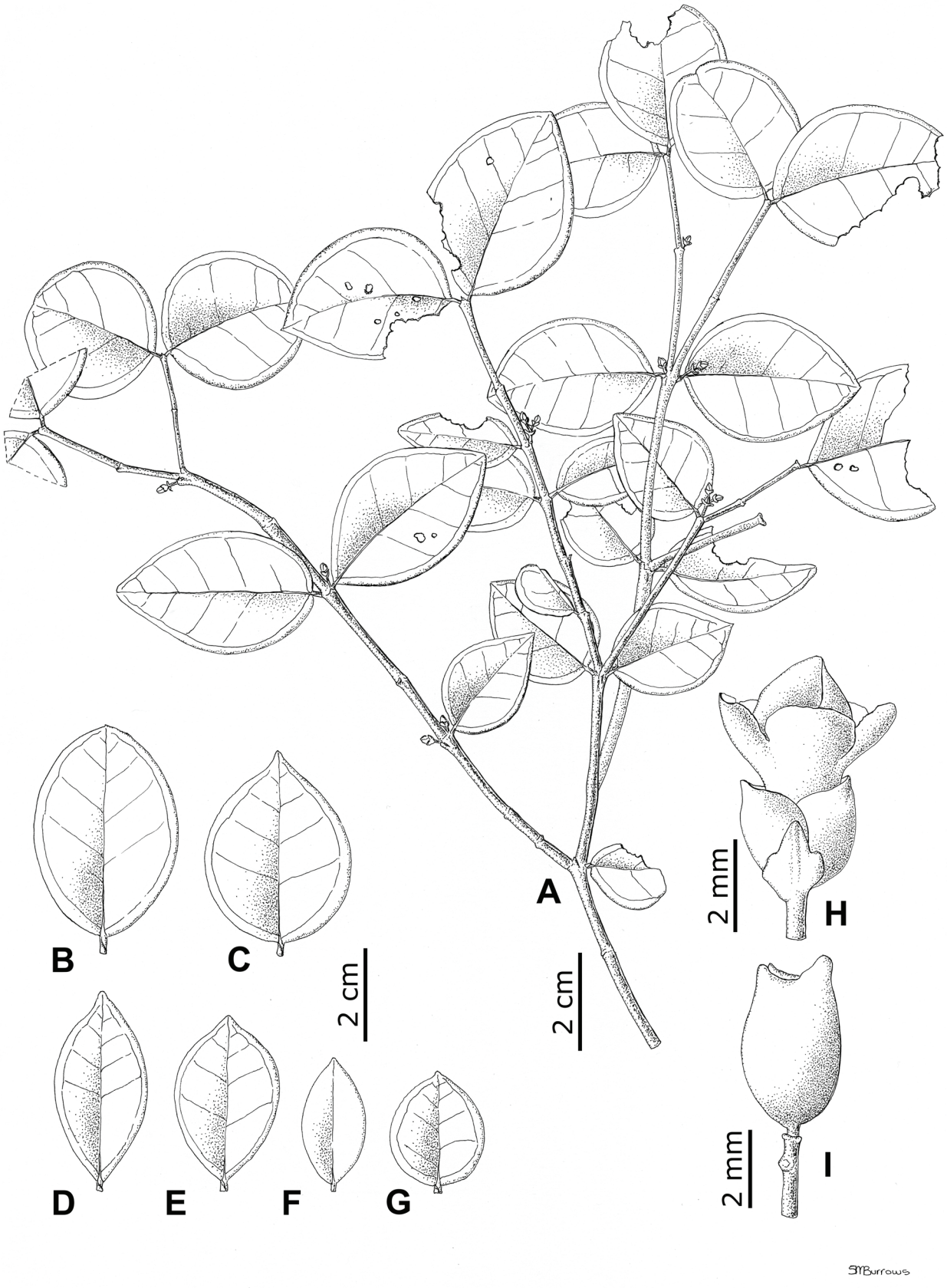


**FIGURE 7.** ***Memecylon australissimum***. **A.** Branchlet. **B–G.** Leaves. **H.** Floral bud. **I.** Fruit. (**A**, **C**, **H** from *Gordon-Gray* s.n. on 25 Nov. 1971; **B**, **I** from *Styles 4770*; **D** from *Stone et al. 2802*; **E** from *Stone & Mona 2800*; **F** from *Stone & Tenza 2783*; **G** from *Styles 4769*. Illustration by Sandie Burrows.)

axils and at the intervening 'aphyllous' nodes; peduncle compressed, 1–2 (–3) mm long, apex dilated, bracts rapidly deciduous; secondary axes 1–4 mm long. Flowers borne individually at the ends of inflorescence axes, subsessile, each flower closely subtended by 3 pairs of opposite-decussate, persistent bracteoles; lower bracteoles 1.5 × 1 mm, dorsally keeled, apex acuminate; median bracteoles broadly ovate-cordiform, 2 × 2 mm, also dorsally carinate; upper bracteoles immediately subtending the base of the hypantho-calyx, 2 × 3 mm; hypantho-calyx green, campanulate, 3 × 4 mm, lobes broadly rounded to subtriangular; corolla in bud rounded-apiculate; petals white, broadly ovate to suborbicular, 3 × 3 mm, apex broadly rounded to abruptly short-acuminate; staminal filaments ca. 5 mm long; anthers dolabriform, 2 mm long, the connective strongly incurved by the dorsal oil-gland, thecae positioned at anterior end; style 8 mm long; epigynous chamber not seen (concealed by the incurved, persistent calyx-lobes). Fruits baccate, ovoid, ca. 7 × 5 mm, green becoming blackish purple at maturity.

**Distribution and habitat**:—Known only from the Hluleka and Dwesa-Cwebe nature reserves, along the coast south of Port St Johns, Eastern Cape (Fig. 3). Habitat in scarp forest from near sea level to ca. 150 m elevation.

**Etymology**:—The species epithet refers to the fact that the Hluleka and Dwesa-Cwebe populations occupy the southern limit of *Memecylon* throughout its entire range in the Old World tropics. The occurrence of a member of this mainly tropical genus at 32°S latitude is noteworthy.

**Phenology**:—Flowers in late November; fruits in mid-December to July.

**Conservation status**:—*Memecylon australissimum* is known from three locations and has an EOO of 93 km$^2$ and AOO of 12 km$^2$ (assuming a 4 km$^2$ grid cell size). Given that all of the known locations are in protected areas managed by Eastern Cape Parks, and that the species is locally common in the Cwebe and Hluleka forests, a status of 'Least Concern' is proposed, with the caveat that this is contingent on the continued effectiveness of conservation measures in these areas.

**Discussion**:—Samples of *M. australissimum* from the Cwebe Forest (*Styles 4769*, *4770* & *4771*) and the Hluleka Nature Reserve (*Stone & Tenza 2783* & *2784*) have produced nrDNA sequences that are identical or nearly so to those of *M. bachmannii* and *M. natalense* sensu stricto (Stone *et al.* 2017a). For this reason, our concept of *M. australissimum* is supported thus far only by morphological evidence. One of the known locations (at Hluleka) is also separated by a distance of only ca. 10 km from the southernmost known occurrences of *M. bachmannii*, in the Mpimbo Forest, Ngqeleni district (*Miller 5439*, PRE) and the upper Bulawa Forest near Mpande (*Cooper 261*, G, NH, PRE). Ongoing phylogenomic and flow cytometry studies of South African *Memecylon* are expected to shed additional light on the nature of the species boundary between *M. australissimum* and *M. bachmannii* (Prabha Amarasinghe, pers. comm., 22 November 2018).

The persistent floral bracteoles and ovoid fruits of *M. australissimum* suggest a close relationship with *M. bachmannii*, but the new species differs by its smaller leaves on short but distinct petioles (blades mostly 3.5–4.5 × 3–3.5 cm, broadly elliptic to broadly ovate and basally cuneate to rounded, petioles 1–3 mm vs blades mostly 5.4–8.5 × 4–7.5 cm, broadly ovate to ± suborbicular and basally rounded to subcordate, subsessile), smaller flowers (ca. 7 mm in diameter with petals 3 × 3 mm vs 10 mm in diameter with petals 6 × 6 mm), and smaller fruits (ca. 7 × 5 mm vs 10 × 8 mm).

The leaves of *M. australissimum* are similar in size and shape to those of *M. natalense*, but the new species notably differs by its persistent floral bracteoles (vs rapidly deciduous) and ovoid fruits (vs subglobose to ± ellipsoid).

**Additional specimens examined**:—**SOUTH AFRICA. Eastern Cape:** Cwebe Forest, near Bashee [Mbhashe] River mouth, 27 May 1970, *Jenkins* s.n. (PRE!); Elliotdale district, The Haven, in forest, 27 Feb. 1971, *Gordon-Gray 2005* (NU!); Dweza [Dwesa] Nature Reserve near Willowvale, forest near Shone Cottage, 32°20′S, 28°58′E, 17 July 1985, *Cooper 290* (NH!); Dwesa Nature Reserve, dry forest, 10 August 1988, *Van Wyk 8299* (PRU!); Cwebe Nature Reserve, north of the Mbashe [Mbhashe] River, elev. ca. 100 m, 32°13′40.0″S, 28°53′44.5″E, 31 December 2013, *Styles 4769* (NU!); same locality, 02 January 2014, *Styles 4770* & *4771* (NU!); Hluleka Nature Reserve, along 'Management Road', coastal forest understorey, *Stone & Tenza 2783* & *2784* (NU); Cwebe Nature Reserve, along unpaved road leading from main gate towards the Haven Hotel, then after less than 1 km turn left onto unpaved road towards Gate 1 through dense coastal forest, elev. ca. 120 m, 32° 13′32.7″S, 28°54′22.6″E, 12 December 2016, *Stone & Mona 2800* (NU!); same locality, 12 December 2016, *Stone et al. 2801* & *2802* (NU!); same locality, elev. 112 m, 32°13′34.9″S, 28°53′49.6″E, 15 December 2017, *Stone & Amarasinghe 2838* (BNRH!).

## Key to the species of *Memecylon* in South Africa

1. Flowers on distinct pedicels 1–4 mm long; ends of secondary inflorescence axes with one pair of rapidly deciduous bracteoles leaving a scar; fruits subglobose to ± ellipsoid ..... 2
- Flowers ± sessile (true pedicels ± absent), closely subtended by 3 pairs of opposite-decussate, persistent bracteoles; fruits ± ovoid ..... 4
2. Leaf-base cuneate (margins curved slightly inward); leaf-apex broadly and obtusely acuminate; calyx-lobes with scarious margin ca. 0.5 mm high; anther connective yellow ..... ***M. kosiense***
- Leaf-base cuneate to rounded or subcordate (margins convex); leaf-apex as above or acutely acuminate; calyx-lobes green throughout (sometimes suffused with dark purple in *M. natalense*), lacking scarious margin; anther connective white ..... 3
3. Young branchlets acutely quadrangular to narrowly quadrangular-alate; leaves broadly ovate to suborbicular, rounded to subcordate at base, subsessile or on short pedicels to 2 mm long ..... ***M. soutpansbergense***
- Young branchlets slender, subquadrangular; leaves ovate-acuminate, cuneate at base, distinctly petiolate (petioles 2–4 mm long) ..... ***M. natalense***
4. Leaves subsessile; blades broadly ovate to ± suborbicular, mostly 5.4–8.5 × 4–7.5 cm, base rounded to subcordate; open flowers 10 mm in diameter; fruits 10 × 8 mm ..... ***M. bachmannii***
- Leaves on distinct petioles 1–3 mm long; blades broadly elliptic to broadly ovate (rarely suborbicular), mostly 3.5–4.5 × 3–3.5 mm, base cuneate to rounded; open flowers ca. 7 mm in diameter; fruits ca. 7 × 5 mm ..... ***M. australissimum***


## Acknowledgements

We are grateful to the curators of the following herbaria for providing loans of or access to specimens or specimen-images: B, BNRH, BR, E, EA, G, K, KIEL, M, MO, NH, NU, NY, P, PCE, PRE, PRU, S, UDW, WAG. Thanks also to Sandie Burrows for her fine work on the line drawings. Others who aided in important ways include Prabha Amarasinghe, Richard Boon, Brice Gijbertsen, Catherine Hanekom, Lindelwa Khumalo, Sharon Louw, Geoff Nichols, Renny Noble, Christina Potgieter, Ntombiphumile Perceverence Tenza, Braam van Wyk and Jan Wieringa. Collection of samples in the Kosi Bay Nature Reserve was done under Ordinary Permits OP 4416/2016 and OP 1102/2017 (issued by Ezemvelo KZN Wildlife to R.D.S.) and under a research agreement with the iSimangaliso Authority (signed by R.D.S. on 15 July 2014). The manuscript was improved thanks to comments by Frank Almeda and an anonymous reviewer; we also give our sincere appreciation to Renato Goldenberg the handling editor. I.G.M. gratefully acknowledges the support of the South African Department of Science and Technology (DST-NRF Innovation Masters Scholarship) and the Botanical Education Trust. S.R. and R.D.S. thank UKZN for research support.


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