



Commiphora namibensis (Burseraceae), a new species from Angola

W. SWANEPOEL

H.G.W.J. Schweickerdt Herbarium, Department of Plant Science, University of Pretoria, Pretoria 0002, South Africa. Postal address: P.O. Box 21168, Windhoek, Namibia. E-mail: wessel@kaokosafari.com

Abstract

Commiphora namibensis Swanepoel, described here as a new species, is known only from the Kaokoveld Centre of Endemism, southwestern Angola. It appears to be closely related to *C. virgata* Engl. Diagnostic morphological characters of *C. namibensis* include the mostly spinescent lateral branches and branchlets, trifoliolate leaves, rarely with a few simple ones also present, the leaflets which are shiny adaxially and a laterally slightly compressed putamen with a yellow pseudo-aril. Illustrations of the plant and a distribution map are provided. Mainly confined to near the coast, the new species is widespread but uncommon between Namibe and Santa Maria.

Introduction

At present about 222 described species of *Commiphora* Jacquin (1797: 66) are accepted worldwide (The Plant List 2013), of which 12 occur in Angola. Five of these species are endemic to the Kaokoveld Centre of Endemism, a biogeographical region with many restricted-range plants and animals in southwestern Angola and adjacent northwestern Namibia (Mendes 1964, 1967, Van Wyk & Smith 2001, Curtis & Mannheimer 2005, Figueiredo & Smith 2008). The Kaokoveld Centre is the principle focal point of endemism and diversity for *Commiphora* in southern Africa (Van Wyk & Smith 2001) and new members of the genus continue to be discovered in this biologically diverse but botanically poorly explored region.

In this contribution, a new species of *Commiphora* from the Kaokoveld Centre is described. During a botanical expedition to southwestern Angola in April 2010, the author encountered an unfamiliar *Commiphora* with bark peeling horizontally in strips and glabrous, trifoliolate leaves. It resembles *C. virgata* Engler (1894: 139) but with branches and branchlets mostly spinescent and with slightly discoloured, adaxially shiny leaves. The plants were sterile at the time. During a subsequent visit in December 2010, flowers and fruit were collected and these confirmed that this is an undescribed species. Plants were found in several localities on the coastal plain between Namibe and Santa Maria. Live material of the new species was studied in the field, and morphological characters in the following description are based on mature leaves, fresh flowering material and ripe fruit. Diagnostic features for *C. virgata* were determined through examination of live plants in southwestern Angola and in Namibia. Additional information for *C. virgata* was sourced from the literature (Van der Walt 1986, Steyn 2003).

Taxonomic treatment

Commiphora namibensis Swanepoel *sp. nov.* (Figs. 1 & 2)

Differs from *C. virgata* Engler in branches and branchlets mostly spinescent; leaves trifoliolate, rarely with few simple ones also present, leaflets shiny adaxially, slightly discoloured, obovate, obcordate, subrhombic, suborbicular or broadly elliptic; disc grooved in male flowers; putamen laterally slightly compressed; pseudo-aril yellow.

Type:—ANGOLA. Namibe Province: 13 km west of Caraculo along main road to Namibe, 1512BA, 526 m, 14 April 2010, *Swanepoel* 329 (holotype PRU!; isotype LUBA!).

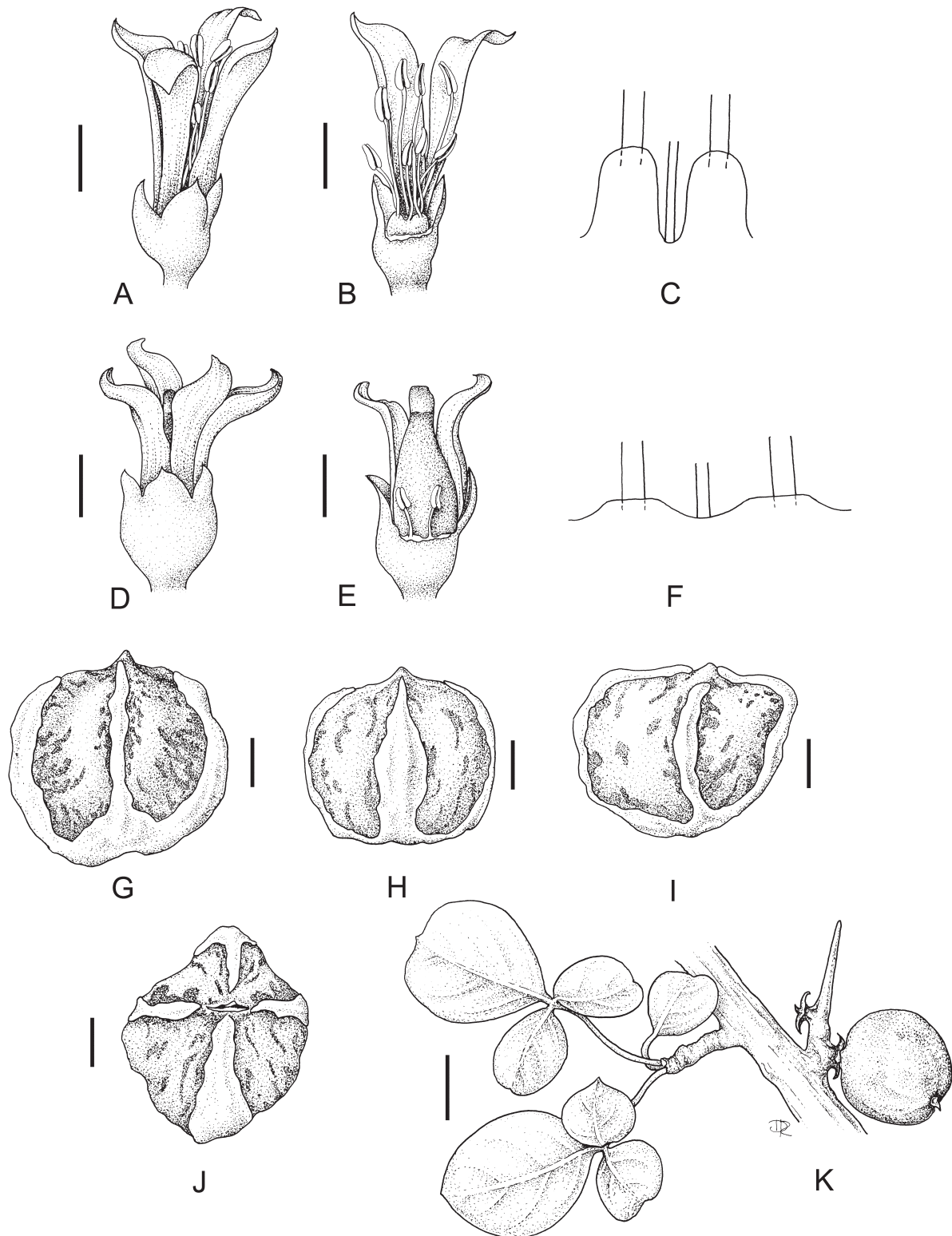


FIGURE 1. *Commiphora namibensis*. (A–C) Male flower; (B) with calyx and corolla partly removed, showing stamens; (C) disc as seen from the inside (schematic, not to scale). (D–F) Female flower; (E) with calyx and corolla partly removed, showing pistil and rudimentary stamens; (F) disc as seen from the inside (schematic, not to scale). (G–J) Putamen with pseudo-aril; (G) fertile locule; (H) sterile locule; (I) sutural view, fertile locule left, sterile locule right; (J) apical view. (K) Leaves and fruit; branch with trifoliolate and simple leaves. Scale bars (A–J) 1 mm, (K) 10 mm. Artist: Daleen Roodt. Vouchers: leaves from *Swanepoel* 329, 333, female flowers, fruit and seed from *Swanepoel* 334, male flowers from *Swanepoel* 335.

Dioecious shrub-like tree 0.4–3 m tall, 1–7 m diam. *Trunk* simple and short, up to 1 m long, 0.35 m diam., branching into relatively thick stems. *Bark* yellowish white to khaki, peeling around stems and older branches in papery strips exposing green to coppery brown under bark with light brown horizontal lenticels; on branches and branchlets brown, grey-brown, reddish brown or grey. *Branches and branchlets* glabrous with few small, prominent lenticels, mostly spinescent, dwarf lateral branchlets scarred. *Exudate* clear (achromatic), scant, drying to form a hard, pale yellow, translucent resin. *Leaves* mostly trifoliolate, rarely few simple leaves also present, clustered on branches, spines and on dwarf lateral branchlets but spirally on actively elongating shoots, petiolate, lamina green, shiny adaxially, slightly discoloured, glabrous or with very few short glandular hairs, leaflets sessile or subsessile, often sub-patent and sub-erect, 0.9–1.6 times as long as broad; lamina of simple leaves ovate or broadly elliptic, apex acute, emarginate or rounded, base cuneate 14–26 × 12–20 mm, lamina of terminal leaflets obovate, obcordate, subrhombic or suborbicular, apex acute, rounded, truncate or emarginate, often shortly acuminate, base cuneate or rounded, 6–34 × 5–28 mm, lamina of lateral leaflets broadly elliptic, obovate, obcordate or suborbicular, often asymmetric, apex rounded, acute, truncate or emarginate, often shortly acuminate, base cuneate or rounded 4–24 × 3–18 mm, terminal and lateral leaflets with margins entire or with 1 or 2 serrations each side towards apex, lateral leaflets smaller than terminal leaflet; midrib and lateral veins conspicuous on both sides, yellow-green; petiole glabrous, 3–27 mm long, pentagonal, trigonal or suborbicular in transverse section with 9–14 vascular bundles, sectional dimensions 0.7–1.5 × 0.6–1.4 mm. *Inflorescences*: axillary, clustered, flowers solitary or in reduced simple cymes, peduncle 0.5–0.7 mm long, glabrous. *Flowers* precocious, unisexual, hypogynous, subsessile, all parts glabrous. *Bracts* crescentic or semi-circular, 0.5–1.2 × 0.3–0.6 mm, margins with short glandular hairs. *Calyx* green, lobes deltoid, acute. *Male flowers* 3.5–4.5 mm long, calyx 1.5–1.8 mm long, calyx lobes ± 0.4 mm long, petals 3.5–3.9 × 1.0–1.2 mm (when flattened), abruptly spreading near apex, minute tip inflexed; disc cylindrical, not adnate to perianth, grooved on inside, fleshy with 4 distinct lobes, lobes not bifid; stamens 8, filaments filiform, 4 long stamens with filaments 2.2–2.6 mm long, inserted high up on outer margin of disc lobes, 4 short stamens with filaments 1.3–1.5 mm long, inserted between lobes on outer margin of disc, anthers on long stamens 0.8–0.9 mm long, on short stamens 0.6–0.7 mm long; gynoecium rudimentary, ± 0.2 long. *Female flowers* 2.7–3.6 mm long, 1.2–1.5 mm diam., calyx 1.3–1.7 mm long, calyx lobes 0.4–0.7 mm long, petals 2.2–3.0 × 0.7–1.1 mm, abruptly spreading near apex, minute tip inflexed; disc with 4 distinct, short lobes, lobes not bifid; staminodes 8, alternately long and short; ovary ovoid or ellipsoid, style relatively long, stigma obscurely 4-lobed; pistil equal in height to petals (top of flower), 2.0–2.4 mm long, 1.1–1.4 mm diam. *Fruit* a drupe, subglobose, suture convex, 6.0–8.2 × 5.0–6.4 mm; pericarp 2-valved; exocarp glabrous, cherry-red when ripe; mesocarp not very fleshy; putamen black, asymmetrical, laterally slightly compressed, rugose, ellipsoid or obovoid with one fertile and one sterile locule, 4.2–5.5 × 3.0–4.1 × 3.5–4.4 mm; fertile locule convex in apical and lateral view; sterile locule triangular in apical view, prominently keeled, especially towards apex; suture convex towards fertile locule; pseudo-aril yellow, covering putamen base, with 4 long arms reaching the apex; apical pits large.



FIGURE 2. *Commiphora namibensis*. Old stems showing flaky bark. (A) Base of plant with low branching, growing tightly wedged among rocks; (B) trunk.

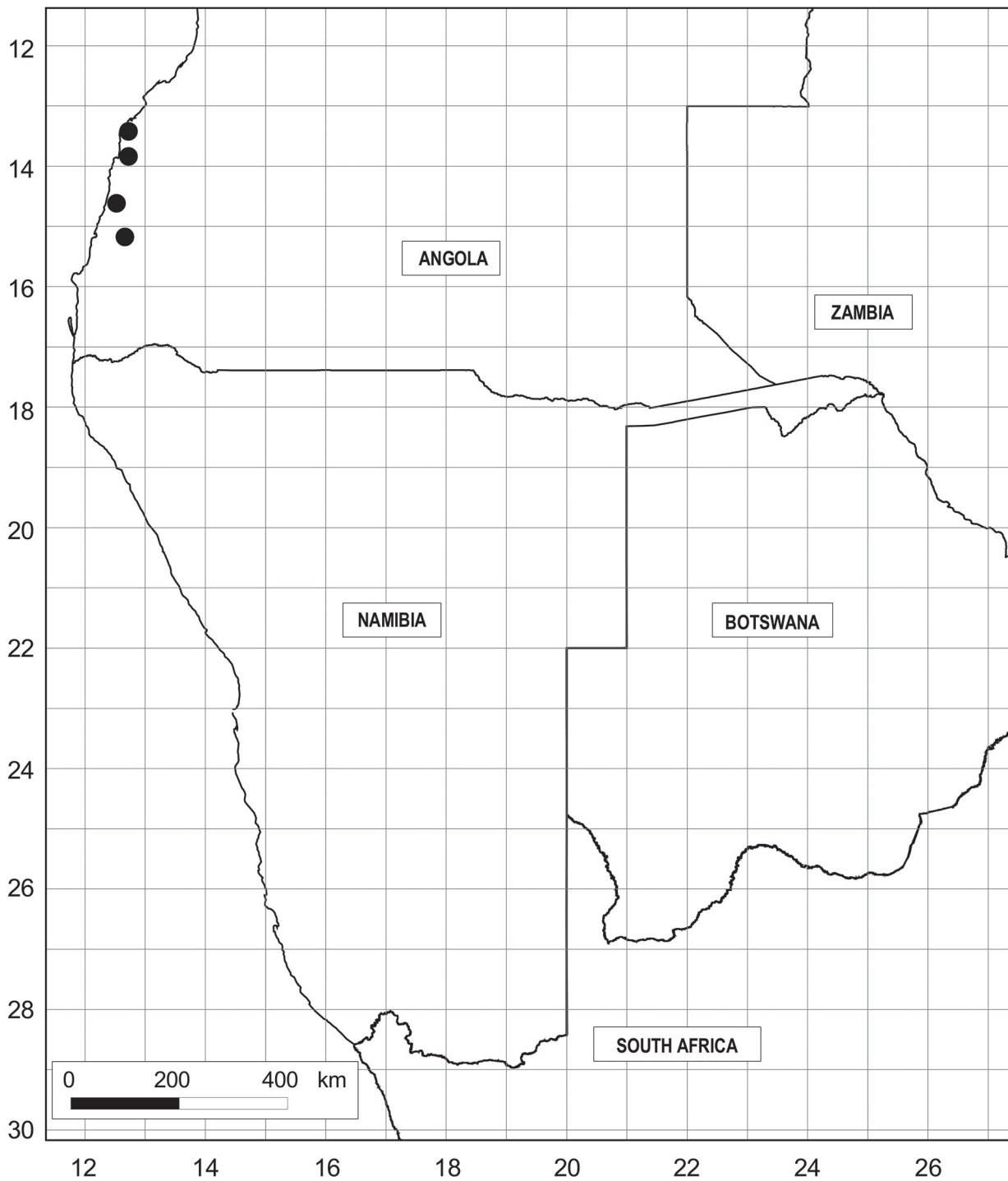


FIGURE 3. Known distribution of *Commiphora namibensis*.

Phenology:—*Commiphora namibensis* flowers in November and December.

Distribution and habitat:—*Commiphora namibensis* is presently known from various localities in the coastal zone of southwestern Angola from Namibe to ± 40 km inland and northwards to Santa Maria (Fig. 3). This arid area falls within the Kaokoveld Centre of Plant Endemism (Van Wyk and Smith, 2001) and is part of the Namib Desert. *C. namibensis* is uncommon and occurs with several other species of *Commiphora* on mountain slopes and level areas, in arid bushveld and desert shrubland at elevations of 20–600 m.

Conservation status:—*Commiphora namibensis* is not under any threat as the plants are located in remote, sparsely populated areas.

Etymology:—The specific epithet refers to the Namib Desert which, in its broadest definition, stretches along the Atlantic Ocean from San Nicolau in Angola through Namibia to the Olifants River in South Africa (Seely 2004). The

Namibe Province, one of the two politically demarcated provinces of Angola in which the new species occurs, as well as the town with the same name, is also named after the Namib Desert.

Additional specimens examined (paratypes):

ANGOLA. Benguela Province: Along track to Meva, (1312BC), 322 m, 25 April 2010, *Swanepoel 333* (PRU!). Namibe Province: 9 km from main road on track to Chicambi, (1312DC), 583 m, 18 April 2010, *Swanepoel 331* (PRU!); 15 km from main road on track to Chicambi, (1312DC), 524 m, 18 April 2010, *Swanepoel 332* (PRU!); 22 km SSE of Chapeu Armado in maritime hills, (1412CB), 438 m, 16 April 2010, *Swanepoel 330* (PRU!); 13 km west of Caraculo along main road to Namibe, (1512BA), 526 m, 14 April 2010, *Swanepoel 329* (PRU!); 13 km west of Caraculo along main road to Namibe, (1512BA), 526 m, 10 December 2010, *Swanepoel 334* (PRU!); 13 km west of Caraculo along main road to Namibe, (1512BA), 526 m, 10 December 2010, *Swanepoel 335* (PRU!).

Commiphora namibensis can be confused with *C. virgata*, with which it occurs sympatrically at several localities. The two species share a similar habit, bark peeling around the stems in papery strips, trifoliolate leaves, hypogynous, unisexual flowers and putamens which are humped on the sterile locule with a pseudo-aril which have 4 narrow arms reaching the apex. However, *C. namibensis* differs from *C. virgata* in some characters of the branches, leaves, flowers, and fruit (Table 1).

TABLE 1. Comparative table of the more prominent differences between *Commiphora namibensis* and *C. virgata*

Character	<i>C. namibensis</i>	<i>C. virgata</i>
Branches and branchlets	Mostly spinescent	Spineless
Leaves	Mainly trifoliolate, rarely few simple; shiny; slightly discoloured; often sub-patent and sub-erect	Trifoliolate; not shiny; not discoloured; not sub-patent or sub-erect
Lamina shape (terminal leaflets)	Obovate, obcordate, sub-rhombic or sub-orbicular	Narrowly obovate, elliptic or broadly elliptic
Lamina shape (lateral leaflets)	Broadly elliptic, obovate, obcordate or sub-orbicular	Narrowly obovate, elliptic or broadly elliptic
Lamina length vs. width	0.9–1.6 : 1	1.4–2.5 : 1
Disc	Grooved on inside in male flowers; lobes not bifid	Not grooved on inside; lobes bifid in female flowers
Putamen	Laterally slightly compressed	Not laterally compressed
Pseudo-aril	Yellow	White to reddish
Distribution	Confined to Kaokoveld Centre of Endemism in southwestern Angola	Kaokoveld Centre of Endemism in southwestern Angola and northwestern Namibia, south to western Hardap Region in central Namibia

Most of the branches and branchlets in *C. namibensis* are spinescent, whereas *C. virgata* is spineless. Leaves in *C. namibensis* are mostly trifoliolate with rarely a few simple ones also present, whereas those of *C. virgata* are invariably trifoliolate. In *C. namibensis* the leaflets are shiny adaxially, slightly discoloured and the shape is quite variable: obovate, obcordate, subrhombic or suborbicular in terminal leaflets and broadly elliptic, obovate, obcordate or suborbicular in lateral leaflets. The leaflets in *C. virgata* are neither shiny nor discoloured and the shape less variable: narrowly obovate, elliptic or broadly elliptic. The leaflets in *C. namibensis* usually are wider than in *C. virgata*, 0.9–1.6 times as long as broad, whereas in *C. virgata* the leaflets are 1.4–2.5 times as long as broad.

Male flowers in *C. namibensis* have a narrowly cylindrical disc which is grooved on the inside whereas the disc in *C. virgata* is comparatively broader and not grooved. In female flowers the disc lobes are not bifid in *C. namibensis* but bifid in *C. virgata*.

Differences in the fruit of the two species include the laterally slightly compressed putamen with a yellow pseudo-aril in *C. namibensis* and the white to reddish pseudo-aril with the putamen not compressed in *C. virgata*.

Acknowledgements

I would like to thank Prof. Abraham E. van Wyk for advice and support, Ms Hester Steyn for preparing the distribution map and Ms Daleen Roodt for the line drawings. The curator, National Herbarium, Pretoria, is thanked for access to their collections; the assistance of Ms Marie Jordaan is acknowledged with thanks. The University of Pretoria is thanked for financial support. For assistance and companionship during field trips, I am especially grateful to my wife Hannelie, friends Ernst van Jaarsveld and Tielman Haumann.

References

- Curtis, B.A. & Mannheimer, C.A. (2005) *Tree atlas of Namibia*. National Botanical Research Institute, Windhoek, 674 pp.
- Engler, A. (1894) *Plantae Gurichianae*. Ein Beitrag zur Kenntnis der Flora von Deutschsüdwestafrika. *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie* 19: 128–152.
- Figueiredo, E. & Smith, G.F. (2008) Plants of Angola/Plantas de Angola. *Strelitzia* 22: 1–279.
- Jacquin, N.J. (1797) *Plantarum Rariorum Horti Caesarei Schoenbrunnensis*, vol. 2. C.F. Wappler, Vienna, pp. 1–68, pl. 130–250. <http://dx.doi.org/10.5962/bhl.title.332>
- Mendes, E.J. (1964) Additiones ed adnotationes florum angolensi – VIII. *Boletim da Sociedade Broteriana* 2(28): 137, 138.
- Mendes, E.J. (1967) Additiones ed adnotationes florum angolensi – X. *Boletim da Sociedade Broteriana* 2(41): 155–164.
- Seely, M. (2004) *The Namib: Natural History of an Ancient Desert*. Desert Research Foundation of Namibia, Windhoek, 110 pp.
- Steyn, M. (2003) *A field guide, southern Africa Commiphora / 'n Veldgids, Suider-Afrika Commiphora*. Published by the author, Polokwane, 92 pp.
- The Plant List (2013) Version 1.1. Published on the Internet; <http://www.theplantlist.org/> (accessed 19 August 2014).
- Van der Walt, J.J.A. (1986) Burseraceae. *Flora of southern Africa* 18(3): 5–34.
- Van Wyk, A.E. & Smith, G.F. (2001) *Regions of floristic endemism in southern Africa: a review with emphasis on succulents*. Umdaus Press, Hatfield, Pretoria, 199 pp.