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A new species of *Sesamothamnus* (Pedaliaceae) from Namibia and Angola

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Abstract

Sesamothamnus leistneri is formally described as a new species with a restricted range, only known from the mountains along the Kunene River in the Kaokoveld Centre of Endemism, a biogeographical region that spans southwestern Angola and northwestern Namibia. The designations "*S. leistner(i)anus*" or "*S. leistneri*" have been previously used to refer to this species, but they were not validly published until now. These trees grow in rocky places on mountain slopes, in kloofs (gorges) and on plateaus. Diagnostic characters for *S. leistneri* include the pronounced tree habit with thickset semi-succulent stem and branches, relatively large green leaves, the corolla lacking a spur, and flowers with a white to cream-white corolla limb. A comparison of some of the more prominent morphological features to differentiate between *S. leistneri* and its possibly closest relative, *S. rivae*, as well as the other four species, *S. benguellensis*, *S. guerichii*, *S. lugardii*, and *S. busseanus* are provided. Based on IUCN Red List categories and criteria, a conservation assessment of Least Concern (LC) is recommended for *S. leistneri*.

Key words: endemism, flora, Iona National Park, Kaokoveld Centre of Endemism, Kunene Region, Sesamothamneae, sphingophily, taxonomy

Introduction

Sesamothamnus Welwitsch (1869: 49) is the sole genus of the tribe Sesamothamneae (Pedaliaceae) and comprises six species of which five have been known for more than 100 years. The sixth was only discovered in 1957 and is still awaiting formal description (Ihlenfeldt 2002, 2004, 2010). The genus is endemic to Africa and has a disjunct north–south distribution. At present three described species of *Sesamothamnus* are recognized in southern Africa, including the *Flora of southern Africa* region (South Africa, Namibia, Botswana, Eswatini, and Lesotho). *Sesamothamnus benguellensis* Welwitsch (1869: 50) and *S. guerichii* (Engler 1894: 151) Bruce (1953a: 418) is recorded from southwestern Angola and northwestern Namibia, whilst *S. lugardii* N.E.Brown ex Stapf (1906: 568) is recorded from southern Zimbabwe, eastern Botswana, and northern South Africa (Germishuizen & Meyer 2003, Ihlenfeldt 2010, Klaassen & Kwembeya 2013). In northeast tropical Africa, *S. busseanus* Engler (1902: 114) and *S. rivae* Engler (1897: 30) are recognized (Ihlenfeldt 2010). Ihlenfeldt (1967, 2001) hypothesized that *Sesamothamnus* may be very close to or even represent the putative ancestor of, the Pedaliaceae, a view subsequently not supported by molecular studies (e.g. Gormley *et al.* 2015).

In the present contribution, the sixth species of *Sesamothamnus*, endemic to the Kaokoveld Centre of Endemism, a biogeographical region rich in range-restricted plants and animals in northwestern Namibia and adjacent southwestern Angola (Van Wyk & Smith 2001) is formally described. In April 1957, during a pioneering botanical expedition to the Kaokoveld in northwestern Namibia, South African botanists Bernard de Winter (1924–2017) and Otto Albrecht Leistner (1931–) collected the first herbarium material of this taxon (Leistner 2022). Being sterile at the time, it was provisionally identified by Leistner as possibly *S. benguellensis*. This gathering, *De Winter & Leistner 5504*, has specimens in both Herbs PRE and WIND. In April 1966 the first fertile herbarium material of the taxon was collected by Namibian botanist Heinrich Johann Wilhelm (Willy) Giess (1910–2000), represented by *Giess 9381*

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in Herb. WIND. The specimens *De Winter & Leistner 5504* and *Giess 9381* in Herb. WIND were subsequently identified as representing a new species of *Sesamothamnus* by Willy Giess. On these specimens appear the designation "*Sesamothamnus leistneranus* Giess ms." written in Giess' hand.

In their treatment of Pedaliaceae for the *Prodromus einer Flora von Südwestafrika*, Merxmüller & Schreiber (1968), with the support of Hans Dieter-Ihlenfeldt (1932–2023), recognized two species of *Sesamothamnus* in Namibia, namely *S. benguellensis* and *S. guerichii*. They did, however, refer in the *Prodromus* to two apparently aberrant gatherings, *Giess 9381* and *De Winter & Leistner 5504*. Seeing that it contained flowers and fruit, *Giess 9381* displayed some distinctive morphological features, but also some that approached mainly those of *S. benguellensis*, but also *S. guerichii*. Hence it was suggested that the taxonomic status of both these gatherings deserve further study.

Ihlenfeldt (1967) provided comments on the taxonomy of the Pedaliaceae in Namibia based on his collaboration with Merxmüller and Schreiber, but also his own revisionary studies on the family. Seeing that the gathering *Giess 9381* was from the contact zone where the ranges of *S. benguellensis* and *S. guerichii* meet, Ihlenfeldt (1967) speculated that it might have been from a transitional form, perhaps even a hybrid, between the two species. He did, however, not make any mention of the *De Winter & Leistner 5504* gathering.

The designation "*Sesamothamnus leistneranus*" was, however, never published by Giess. The novel status of the taxon was subsequently supported by Ihlenfeldt who in 1984 affixed a determinavit slip to *De Winter & Leistner 5504* (sheets in Herbs PRE and WIND), as well as to the two sheets of *Giess 9381* in Herb. WIND, with the designation "*Sesamothamnus leistneranus* Giess ex Ihlenf." However, Ihlenfeldt also never validly published this designation. According to Leistner (2022) Ihlenfeldt, in an email dated 12 June 2011, mentions two reasons for this delay in publishing the new species: an uncertainty regarding the exact locality where *De Winter & Leistner 5504* was found, and the fact that he could not trace the prospective holotype: *Giess 9381*.

Our first experience with the new *Sesamothamnus* dates from 1990. In that year, during an expedition to the Kaokoveld, one of us (WS) noticed an unfamiliar, thickset tree with a single well-defined trunk, which on closer examination was found to be without flowers but with the remains of capsules typical of *Sesamothamnus* and leaves similar in colour to those of *S. benguellensis.* In January 2005 the same taxon, this time in both flower and fruit, was recorded by both of us in the Otjitanda area during a botanical expedition to the Kaokoveld, enabling fertile material to be collected and the plants to be identified as an undescribed species of *Sesamothamnus*, conspecific with the aforementioned earlier gatherings by De Winter and Leistner, as well as Giess. The tree habit is quite pronounced (Figs 1 & 2) and unlike the other three species in southern Africa, which are shrubs with several thick, tapering main stems arising from a swollen base. A study of the *Sesamothamnus* holdings in Herbs PRE and WIND revealed a number of other collections of the new species, several with determinavit slips and the designation "*Sesamothamnus leistneranus* Giess ex Ihlenf." The taxon was subsequently collected or recorded by one of us (WS) and other workers in several localities in the mountainous parts to the south of the Kunene River in the Kaokoveld of Namibia, as well as to the north of the Kunene River in bordering parts of Angola. The new species seems to form a link between the southern and northeastern groups of *Sesamothamnus* in Africa since it shares the same type of mucilaginous hairs with the northeastern group (more information on this intra-African disjunction under "Notes" as part of the taxonomic treatment). Judged from this, the new species was suggested to be phylogenetically probably more closely related to the northern group than the southern group (Ihlenfeldt 2010). Although the sharing of the same type of mucilaginous hairs with the northeastern group could be due to a shared recent ancestor, an alternative possibility is that this feature has evolved independently, perhaps linked to ecology.

In 2001 the new species was added to the Dendrological Society of South Africa's tree list as *Sesamothamnus sp. nov.* (Von Breitenbach *et al.* 2001). It is readily distinguishable in the field and has been recognized as a still-to-be-named species (without suggested specific epithet) in a number of subsequent publications (e.g. Coates Palgrave 2002, Curtis & Mannheimer 2005, Van Wyk *et al.* 2011, Von Dürckheim *et al.* 2014). In a checklist of Namibian plant species, Craven (1999) listed the new species as "*Sesamothamnus leistneri* ined.", thus deviating from the epithet "*leistneranus*" originally proposed by Giess. Ihlenfeldt (2004, 2010) also used the designation "*Sesamothamnus leistneri*" despite having used the epithet "*leistneranus*" on determinavit slips. Note that according to the *International Code of Nomenclature for algae, fungi, and plants* (ICN) (Turland *et al.* 2018), the correct form of the latter epithet is "*leistnerianus*". In yet another checklist of Namibian plants, the designation appeared with corrected spelling of the epithet, namely "*Sesamothamnus leistnerianus* Giess ex Ihlenf., ined." (Klaassen & Kwembeya 2013). "*Sesamothamnus leistneri*", together with an English description and illustrations, were published without indication that it is a designation not validly published in *Le Roux and Müller's field guide to the trees and shrubs of Namibia* (Mannheimer & Curtis 2009: 454). However, this name was not validly published by Mannheimer & Curtis (2009), because it was, amongst others, not furnished with a Latin diagnoses/description, a requirement at that time, nor with

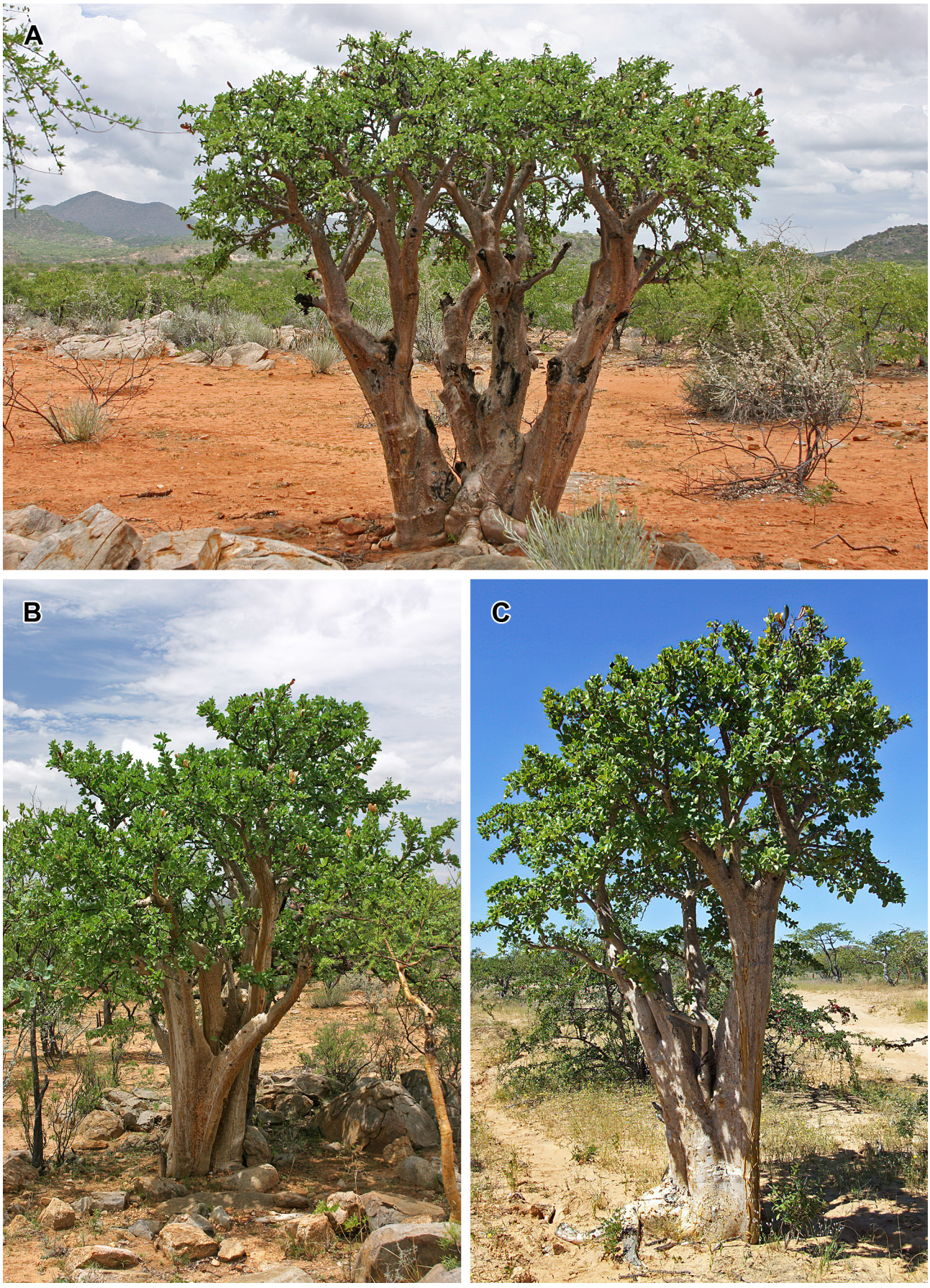

FIGURE 1. *Sesamothamnus leistneri*, habitat and habit. **A.** Multi-stemmed tree with distinct browse line caused by domestic stock. **B & C.** Trees showing typical upright habit and relatively dense green foliage during the rainy season. Photographs by A.E. van Wyk (A, B) and W. Swanepoel (C).

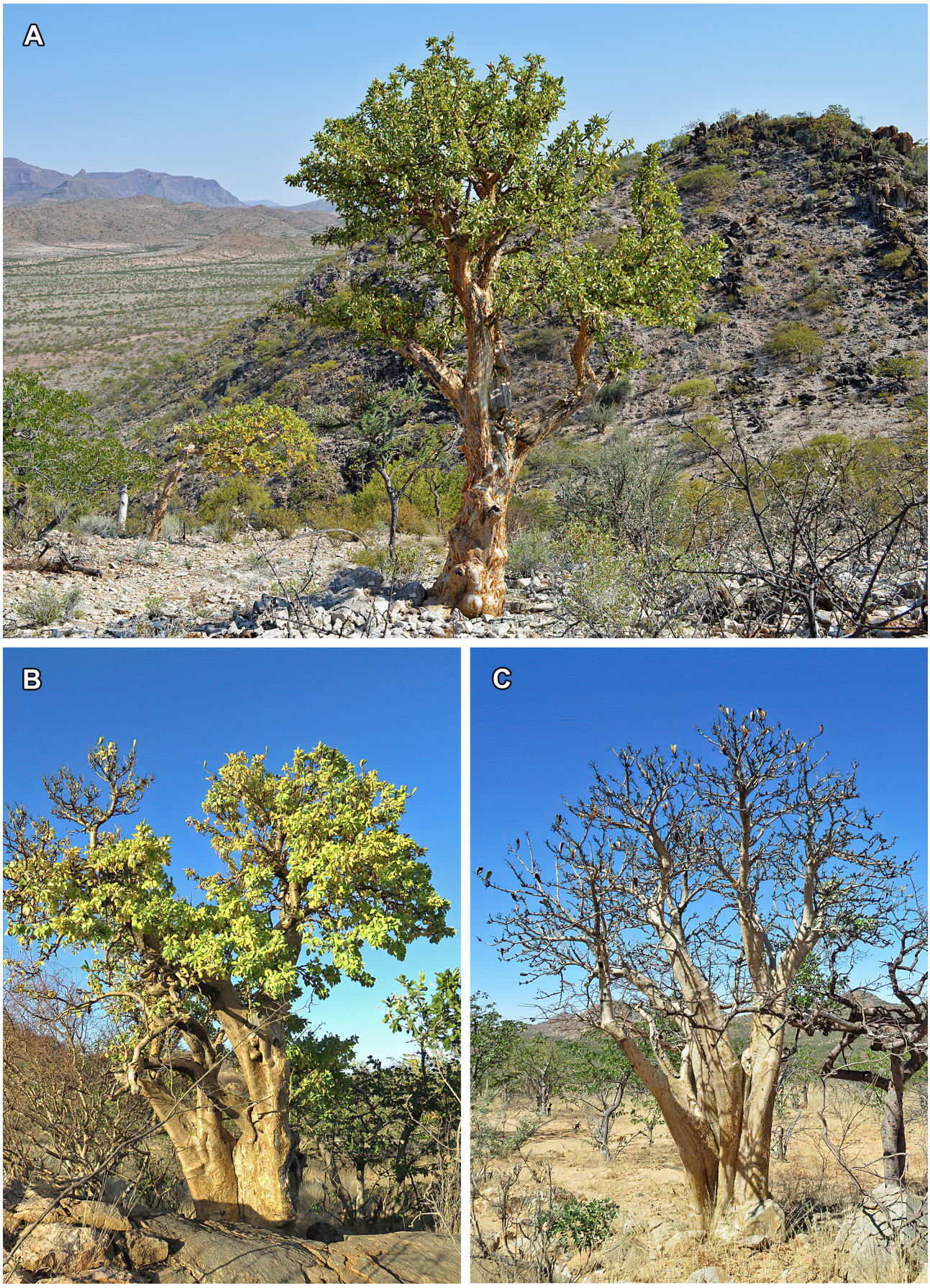

FIGURE 2. *Sesamothamnus leistneri*, habitat and habit. **A.** Typical single-stemmed tree. **B.** Tree with foliage starting to turn yellow in autumn. **C.** Leafless tree during the dry season (winter), with persistent dehisced fruit. Photographs by W. Swanepoel.

the designation of a type, both of which are requirements for valid publication according to the ICN (Turland *et al.* 2018: Art. 39.1, 40.1). This designation, still not validly published (although a Latin diagnoses/description was no longer required by the ICN), appeared in a second edition of this tree book (Mannheimer & Curtis 2018: 468). In this paper we validly publish the new species as *S. leistneri*.

Methods

Morphological descriptions and ecological information presented here are based on field observations and material collected following extensive field work in Namibia and southwestern Angola. This was supplemented by study of relevant literature and herbarium collections. Diagnostic features for *S. leistneri* and *S. benguellensis* were determined through examination of fresh material, herbarium material, and the literature (Welwitsch 1869, Ihlenfeldt 2010), for *S. busseanus* and *S. rivae* from the literature (Bruce 1953b, Ihlenfeldt 2010), and for *S. guerichii* and *S. lugardii* from herbarium material and the literature (Codd 1971, Ihlenfeldt 1988, 2010, Mannheimer & Curtis 2018). The herbaria of the National Botanical Research Institute in Namibia (WIND), the South African National Biodiversity Institute, Pretoria (PRE), and the University of Pretoria (PRU) were consulted for possible collections of the new species (herbarium abbreviations follow Thiers 2023). Locality information for specimens cited also provides the particular quarter degree grid squares following the degree reference system of Edwards & Leistner (1971). The distribution map was compiled from specimen data using ArcView 3.1 software. Conservation assessment follows IUCN (2012).

Taxonomic treatment

Sesamothamnus leistneri P.Craven ex Swanepoel & A.E.van Wyk, *sp. nov*. (Figs 1–5)

Diagnosis:—Single or usually multi-stemmed succulent tree, morphologically most similar to *Sesamothamnus rivae*, differing by being up to 8 m tall with high succulence of main stems (*vs*. small multi-stemmed tree up to 3 m tall, low succulence of main stems), flowers lacking a spur (*vs*. spur present), and flowering during the rainy season with developed leaves (*vs*. flowering before onset of rainy season when plants still leafless).

Type:—NAMIBIA. Kunene Region: Kaokoveld, 5 Meilen oestlich Otjihende. Auf Berghang [5 miles east of Otjihende, on mountain slope], (1712DB), 23 April 1966, *Giess 9381* (holotype WIND: 48985!; isotype WIND: 48986!).

"*Sesamothamnus sp. nov.*" in Coates Palgrave (2002: 1015); Curtis & Mannheimer (2005: 607); Van Wyk *et al.* (2011: 615). *Sesamothamnus leistneri* nom. inval. in Mannheimer & Curtis (2009: 454, 2018: 468).

Illustrations:—Curtis & Mannheimer (2005: 608, *Sesamothamnus sp. nov.*, photographs of habit and flower); Mannheimer & Curtis (2009: 455; 2018: 469, *Sesamothamnus leistneri* nom. inval, photographs of habit, bark, leaves, flower, and fruit); Ihlenfeldt (2010: 153, fig. 1; 158, fig. 7; 159, fig. 13, *Sesamothamnus leistneri* nom. inval, habit, flower, and mucilaginous hairs); Becker *et al.* (2021: 58, *Sesamothamnus leistneri* ined., habit); Leistner (2022: 64 & 65, *Sesamothamnus leistneri* ined., habit and flowers).

Single or usually multi-stemmed succulent tree up to 8 m tall; stems often fluted at base (Fig. 3A), branching fairly high, spiny; spines 1–3 per node, produced by modification of petioles (Fig. 3E), straight or slightly recurved, central one up to 30 mm long, laterals up to 10 mm long or absent. *Bark* cream-yellow, smooth, often peeling in papery strips (Fig. 3B). *Leaves* simple, petiolate (petiole 10–30 mm long) and spirally arranged on long shoots, subsessile (petiole 1–10 mm long) and fasciculate on dwarf lateral shoots in axils of spines (Fig. 3C), deciduous; lamina narrowly ovate, narrowly obovate or elliptic, 40–70 × 15–40 mm, green, often shiny (Fig. 3D), both sides sparsely covered with quadrangular-headed mucilage glands; apex obtuse, rounded or emarginate, base decurrent; margins entire, midrib and lateral veins prominent abaxially, sparsely covered with quadrangular-headed mucilage glands. *Inflorescences* racemose, terminal, up to 12-flowered, dark green, with ca. rectangular headed mucilage glands, glandular hairs and villose hairs. *Flowers* large, lacking a spur; pedicels 5–6 mm long; calyx 5-partite, dark green, indumentum similar to that of inflorescences, ca. 6 mm long, subequally lobed, posterior lobe smaller, lobes deltate, ovate or narrowly triangular, ca. 5 mm long, ciliate with villose hairs; corolla with developing tube straight at first, then recurved, green or black-green, eventually long, cylindrical, straight or only slightly curved, 95–150 mm long, 4–6 mm diam., slightly widened at base with posterior side slightly gibbous, inside glabrous, bright yellow (Fig. 4D), contrasting with white filaments (fused with tube), outside yellow-green to cream-white; limb spreading at first, later reflexed, 50–55 mm diam., white to cream-white, outside of corolla with indumentum similar to that of inflorescences; lobes 5, subcircular,

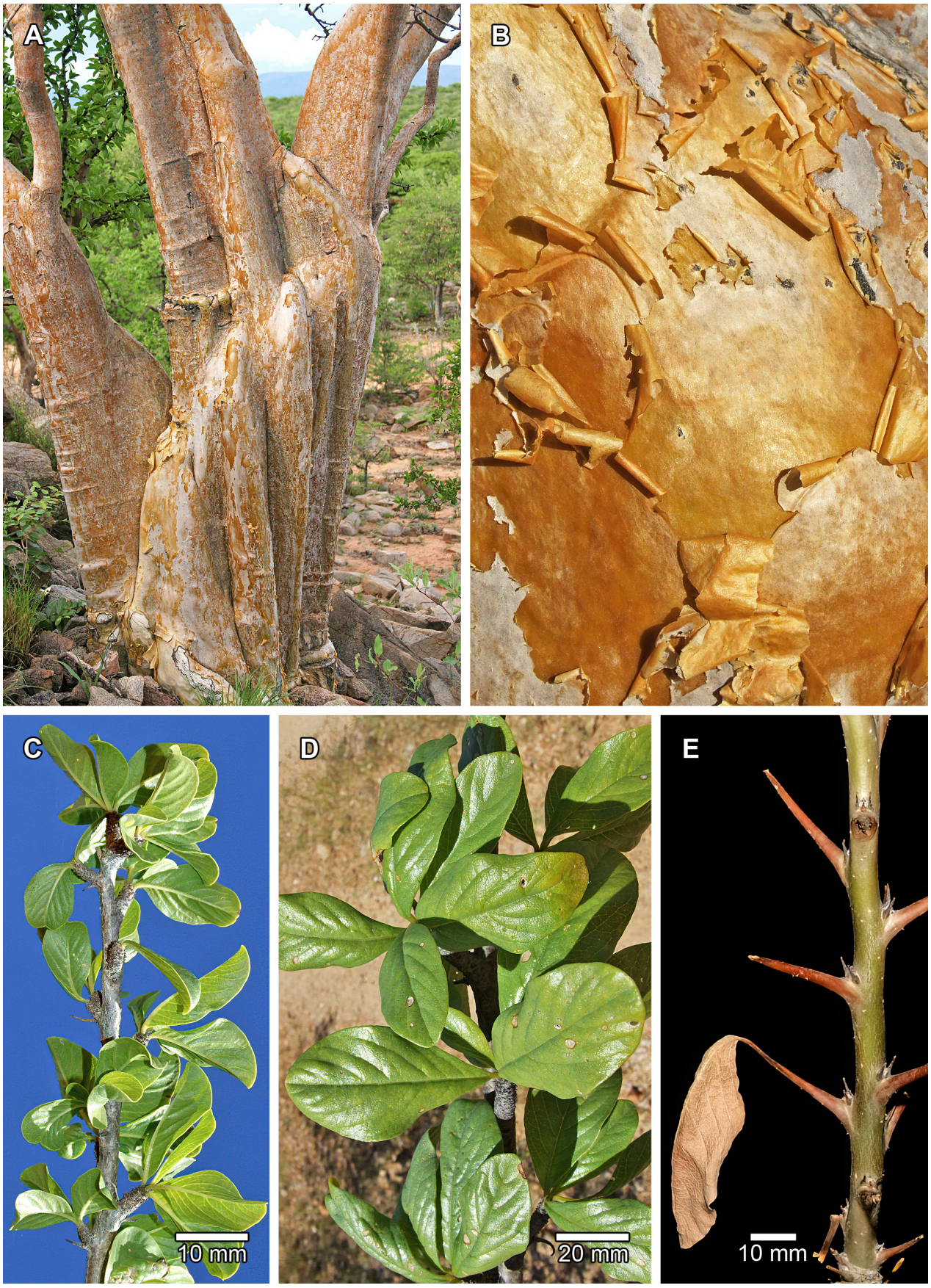

FIGURE 3. *Sesamothamnus leistneri*, vegetative morphology. **A.** Single-stemmed tree showing ± fluted trunk. **B.** Bark peeling in papery pieces. **C.** Long shoot with leaves clustered on lateral short shoots. **D.** Mature leaves showing green colour and ± glossy upper surface. **E.** Long shoot with spines derived from petioles; one dried leaf blade still attached. Photographs by A.E. van Wyk (A, E) and W. Swanepoel (B–D).

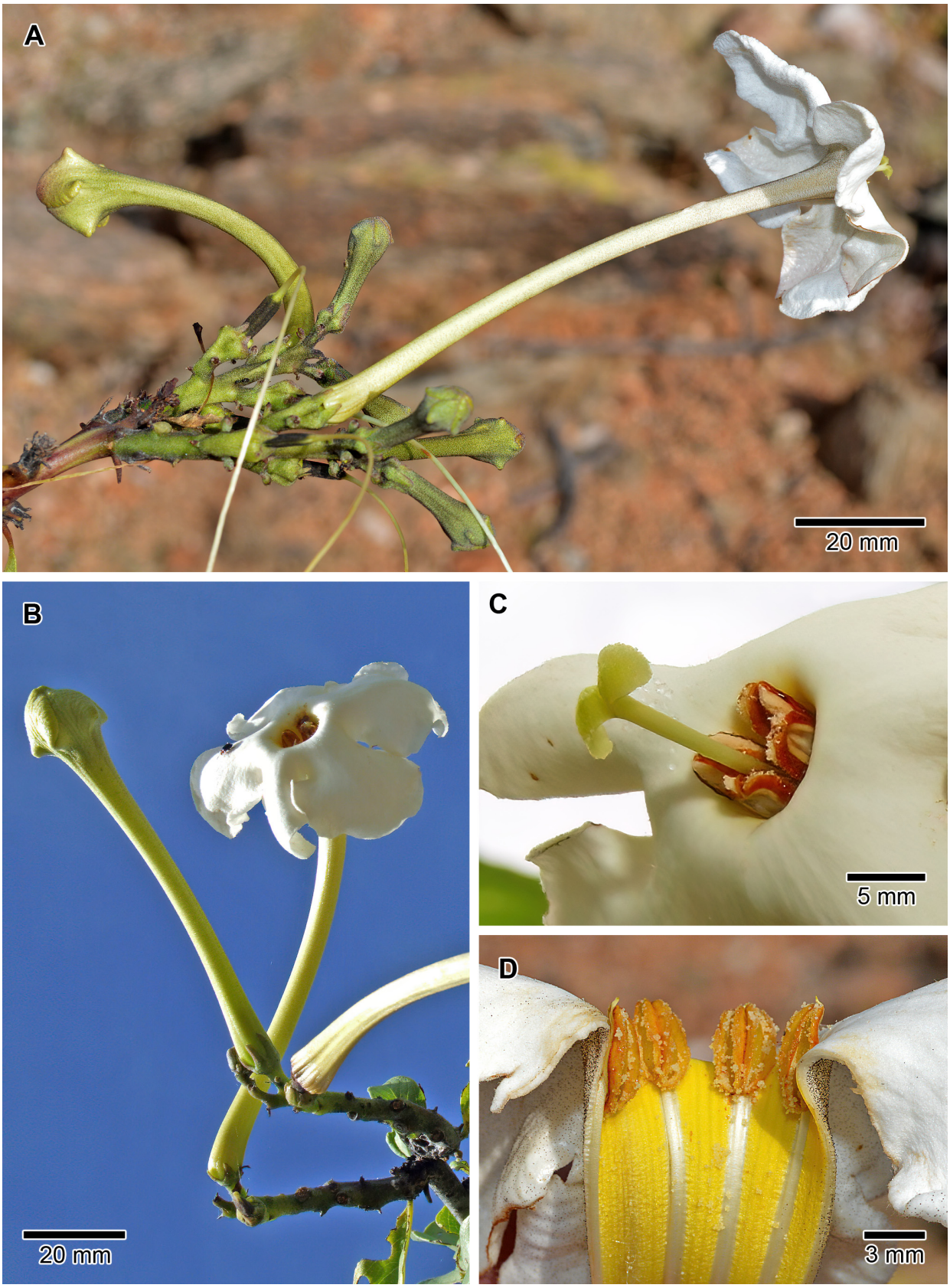

FIGURE 4. *Sesamothamnus leistneri*, flower morphology. **A.** Inflorescence showing one open flower, several flowers in different stages of development, and persistent styles (whitish, tipping blackish ovaries) of faded flowers following shedding of the corolla. **B.** Flowers, open and in bud; note both stamens and stigma positioned in mouth of the corolla tube, also the lack of a spur at the base of the tube. **C.** Flower showing style with bilobed stigma exserted about 10 mm from the mouth of the corolla tube. **D.** Distal part of corolla tube opened out to show the yellow inner surface of the tube, white filaments, and anthers positioned at the level of the corolla mouth. Photographs by W. Swanepoel (A, B, D) and A.E. van Wyk (C).

24–30 mm diam. Stamens 4, equal, inserted in mouth of corolla tube; filaments adnate to tube, free part ca. 1.5 mm long; anthers included in the corolla mouth, orange-yellow, ca. 5.5 mm long; pollen white. Ovary oblong, sometimes slightly widening towards apex, ca. 10 mm long, laterally compressed, indumentum similar to that of inflorescences. Style slender, equalling corolla tube; stigma reaching corolla mouth or exserted by up to 10 mm, broadly bi-lobed. *Fruit* a rigid woody capsule, narrowly obovate, 65–90 × 25–32 mm, laterally compressed, apex rounded to tapering or emarginate, apiculate, green, yellowish brown when ripe. *Seeds* flat, obovate, broadly winged, 16–24 × 10–14 mm (including wings).

Phenology:—Flowers were recorded from January to June. Fruit development is quick and mature ones may be encountered from February onwards. Seeds are released shortly after fruit maturation, usually well before the next rainy season.

Distribution, habitat and ecology:—*Sesamothamnus leistneri* is known from several localities in the mountainous region on both sides of the Kunene River, northwestern Namibia and southwestern Angola (Fig. 6), where it is localized and usually solitary. In Namibia it occurs from the Ehomba Mountain and Zebra Mountains in the east throughout the Baynes Mountains to the Otjihipa Mountains in the west and southwards to near Sesfontein. In Angola the species has been recorded near the summit of Serra Tchamalindi, Iona National Park (Becker *et al.* 2021), but it may eventually prove to be present on other mountains in the vicinity, as what appears to be suitable habitat is not limited to this specific mountain. *Sesamothamnus leistneri* grows on rocky mountain and valley slopes, in kloofs (gorges), less often on plateaus and at the base of hills, in *Colophospermum-Commiphora* woodland at elevations of 1000–1600 m, 83–220 km from the Atlantic Ocean. Average annual rainfall in the area is 100–300 mm (Mendelsohn *et al.* 2002).

Conservation status:—*Sesamothamnus leistneri* is rare and localised but widespread in uninhabited to sparingly inhabited parts of the Kunene Region of Namibia, and the far southeastern part of Namibe and most probably bordering southwestern parts of Cunene provinces in Angola. The species does not seem to be utilised by humans, but during times of drought is heavily browsed by domestic stock, mainly goats and cattle (Fig. 1A), which may result in considerable damage to plants. It should be considered as Least Concern (LC) since it is not endangered or vulnerable currently and is widespread in the extensive mountainous area on both sides of the Kunene River in Namibia and Angola (IUCN 2012).

Etymology:—The specific epithet honours Otto Albrecht Leistner, who, together with Bernard de Winter, first collected *Sesamothamnus leistneri* in 1957 during an epic collecting trip to the Kaokoveld (Leistner 2022). In our choice of name, we have chosen to use the epithet as a noun in the genitive case ("*leistneri*") rather than an adjective ("*leistnerianus*"). Either of these options have been used to designate the taxon in the past. We consider the genitive case to be more appropriate, as it indicates that this species is Leistner's particular discovery, not anybody else's.

Notes:—*Sesamothamnus leistneri* differs from the three other southern African members of the genus in habit, leaf, indumentum, and flower characters. It is morphologically more similar to the two northeast African species (hence our choice of *S. rivae* to compare it with in the Diagnosis) with which it shares an indumentum of mucilage hairs with quadrangular heads; the other three southern African species have mucilaginous hairs with distinctly stellate heads (Ihlenfeld 2010: 159, figs 13 & 14). It has also been suggested that *S. leistneri* may well be the most primitive member of the genus (Ihlenfeldt 1994).

The suggested closer affinity of *Sesamothamnus leistneri* with the disjunct northeast African *S. rivea*, rather than the three other southern African members of the genus, is not unexpected. There are well-known floristic (and faunal) links, often involving discontinuities in distribution, between arid areas in southern Africa and arid areas in East Africa, the Horn of Africa, and Arabia. These disjunct patterns indicate that at least the semi-arid habitats have been connected by an arid corridor, the periodic existence of which was presumably related to patterns of climate change, with arid episodes accompanied by, among other causes, periods of glaciation. Abundant botanical and zoological evidence support the existence of such a periodical arid corridor (e.g. Van Wyk & Smith 2001 and references therein, Thiv *et al.* 2011, Bellstedt *et al.* 2012, Linder 2014).

Apart from the differences in habit and morphological characters, the distribution of the three southern African taxa differs, with *Sesamothamnus leistneri* being confined to the mountainous areas immediately to the north and south of the Kunene River in the Kaokoveld Centre of Endemism in Angola and Namibia, and *S. benguellensis* to the northern part of the Kaokoveld Centre in Angola from the Benguella, Namibe, and Cunene Province southwards crossing the Kunene River into Namibia as far as the Rooidrom area (just south of the Marienfluss Valley). *Sesamothamnus guerichii* is confined to the southern part of the Namibian Kaokoveld from the Rooidrom area southwards to Omatjette near Omaruru in the Erongo Region. Only a single locality is known where *S. leistneri* and *S. guerichii* grow together (Ihlenfeldt 2010). Some of the more prominent morphological features to differentiate amongst all the currently recognised species of *Sesamothamnus* are supplied in Table 1.

TABLE 1. Prominent morphological differences amongst *Sesamothamnus leistneri*, *S. benguellensis*, *S. busseanus*, *S. guerichii*, *S. lugardii* and *S. rivae*.

Character	*S. leistneri*	*S. benguellensis*	*S. busseanus*	*S. guerichii*	*S. lugardii*	*S. rivae*
Habit	Single- or multi-stemmed tree, up to 8 m tall	Compact low shrub to 2 m tall, rarely a shrub up to 3.5 m tall	Shrub or small multi-stemmed tree, 2–5 m tall	Shrub, 3–5 m tall	Shrub, 3–5 m tall	Shrub or small multi-stemmed tree, 2–6 m tall
Succulence of main stems	High	High	Low	Medium to high	Medium	Low
Leaf lamina	Narrowly ovate, narrowly obovate or elliptic, 40–70 × 15–40 mm, green, often shiny	Obovate to oblanceolate to broadly elliptic, 40–60 × 20–30 mm, green, dull	Obovate, 20–50 × 10–25 mm, pale green to yellowish green, dull	Obovate to oblanceolate, 20–30 × 5–8 mm, grey-green, dull	Oblong to obovate, 10–25 × 4–6 mm, grey, dull	Obovate (occasionally ovate), 20–80 × 30–60 mm, grey, dull
Mucilage hairs	Sparse; heads ca. quadrangular	Dense on abaxial side of leaf lamina; heads stellate	Sparse; heads ca. quadrangular	Dense on abaxial side of leaf lamina; heads stellate	Dense on abaxial side of leaf lamina; heads stellate	Sparse; heads ca. quadrangular
Flowering period	During rainy season; plant with well-developed leaves	Prolonged and irregular; individual plant usually without leaves	Before onset of rainy season; plant still leafless	Before onset of rainy season; plant still leafless	Before onset of rainy season; plant still leafless	Before onset of rainy season; plant still leafless
Flower basic colour of corolla limb (before fading)	White or cream-coloured, tube may be purplish outside	White or cream-coloured, tube may be purplish outside	White or cream-coloured, tube may be purplish outside	Yellow	White or cream-coloured, tube may be purplish outside	White, cream-coloured or whitish brown
Corolla tube (shape & size)	Straight or only slightly curved, 95–150 mm long, 4–6 mm diam.	Slightly curved, 50–80 mm long, 4–5 mm diam.	Straight, 25–40 mm long, 3–5 mm diam. at base, widening to 7–11 mm diam. at throat	Curved, sometimes S-shaped, 50–65 mm long, ca. 4 mm diam.	Slightly curved, 80–100 mm long, 4–6 mm diam.	Straight, 50–70 mm long, 2.5 mm diam. at base widening to 6 mm diam. at throat
Corolla spur	Absent, posterior side of corolla tube base slightly gibbous	Present, 20–40 mm long	Present, 40–60 mm long	Absent but corolla tube base prominently gibbous	Present, 8–15 mm long	Present, 30–60 mm long
Filaments	Free part ca. 1.5 mm long	Free part ca. 2.5 mm long	Free part ca. 1.5 mm long	Free part 32–45 mm long	Free part 4–5 mm long	Free part 6–8 mm long
Position of anthers	In mouth of tube	In mouth of tube	In mouth of tube	Exserted from tube to just before mouth	In mouth of tube	In mouth of tube
Distribution	Far southwestern Angola, southwards over the Kunene Rivere into northwestern Namibia to near Sesfontein	Southwestern Angola: coastal plain southwards crossing the Kunene River into northwestern Namibia as far south as the Rooidrom area	Northeastern Africa in Ethiopia, Somalia, Kenia, and Tanzania	Northwestern Namibia: from the Rooidrom area southwards to Omatjette	Southern Zimbabwe, eastern Botswana and northern South Africa	Northeastern Africa in Ethiopia, Somalia, Kenia, and Tanzania

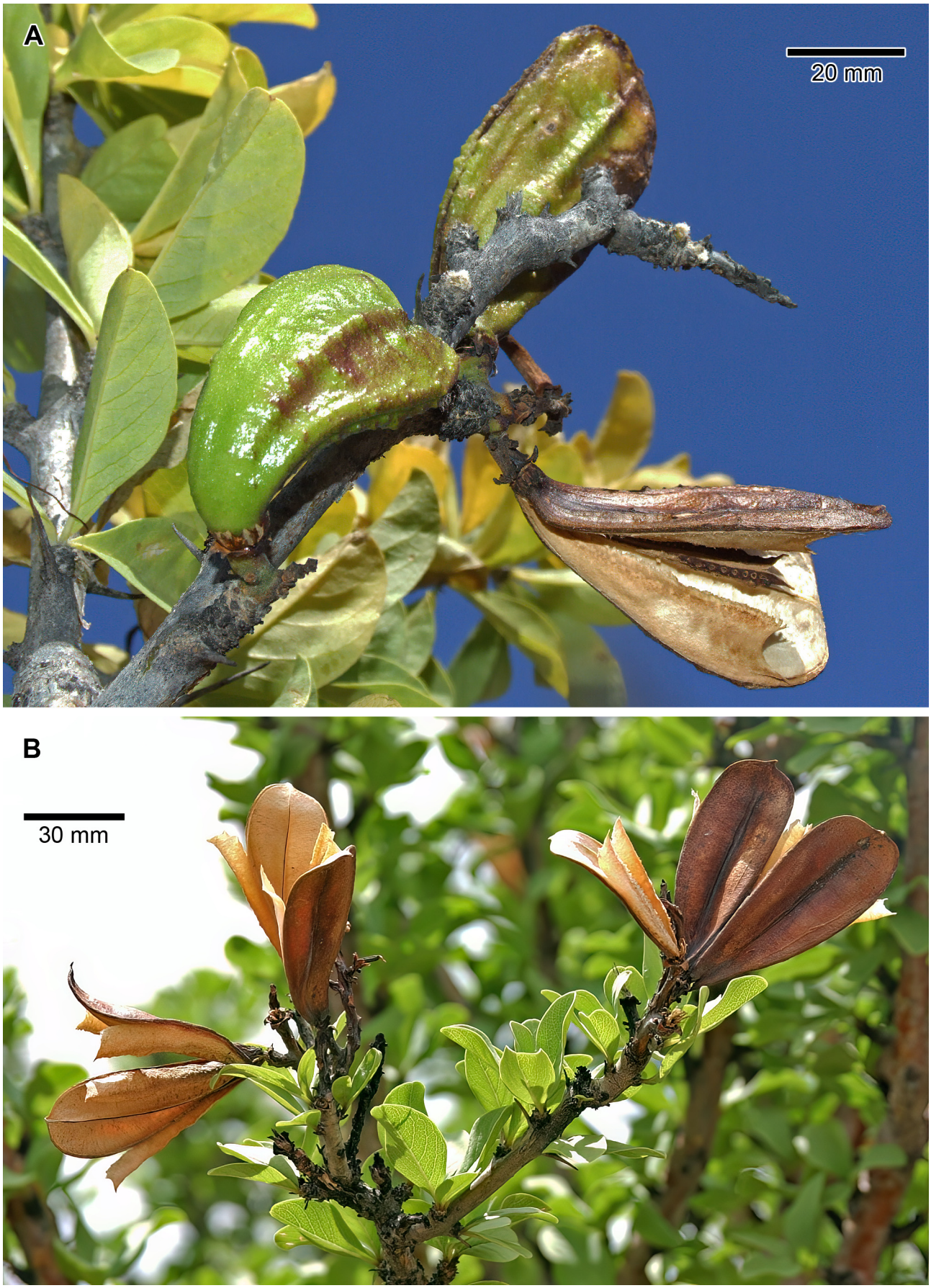

FIGURE 5. *Sesamothamnus leistneri*, fruit morphology. **A.** Two almost mature fruit and a dehisced one. **B.** Old dehisced fruit persist for some time on trees. Photographs by W. Swanepoel (A) and A.E. van Wyk (B).

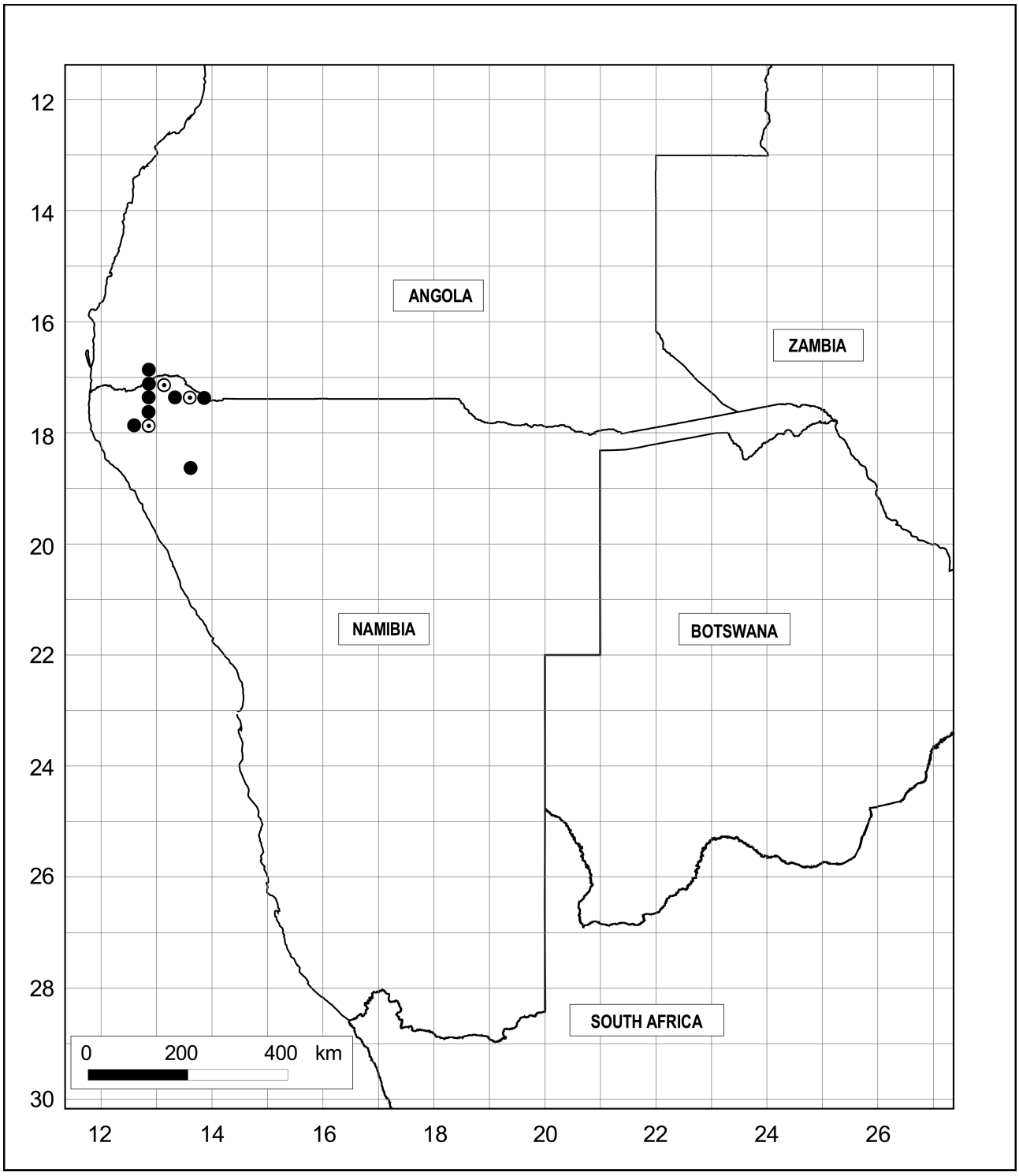

FIGURE 6. Known distribution of *Sesamothamnus leistneri*. Solid circles indicate localities supported by herbarium specimens in PRE and WIND; open circles with small central dots depict sight records only.

The floral traits of *S. leistneri* suggest that it is specialised for pollination by long-tongued hawkmoths (flowers display the sphingophilous syndrome), as is the case in all the other members of the genus (Ihlenfeldt 2004). Flowers open in the later afternoon and in the evening, are sweetly scented, and contain abundant nectar. They last only a single night before the corollas are shed. Further study is needed to investigate the significance of variation in the degree to which the style protrudes from the corolla tube in flowers. This variation may well result from differences in the timing of maturation between the male and female floral parts. According to Ihlenfeldt (2004), protogyny has been observed in *Sesamothamnus*, and it is possible that this type of dichogamy is present in *S. leistneri*.

Additional collections (paratypes):—ANGOLA, Namibe Province:—1612: Serra Tchamalindi, eastern part of range, (–DD), *Swanepoel, Van Jaarsveld & Gomes 622* (LUBA!).

NAMIBIA, Kunene Region:—1712: Kaokoveld, Otjomborombonga, main kloof to the south, (–BB), 14 July 1976, *Leistner, Oliver, Steenkamp & Vorster 162* (PRE!); Otjihipa Mountains, (–BD), 21 December 1999, *Bruyns 8042* (WIND!); Mountain slopes with large weathered boulders at Ombepera, (–DB), 11 April 1957, *De Winter & Leistner 5504* (PRE!, WIND!); Otjihende, where Otjihende Dam road forks ± half mile from Otjihende, (–DB), 24 February 1973, *Owen-Smith & Malan 291A* (WIND!); 8 km oos van Otjitanda (–DB), 23 June 1977, *Viljoen 432* (WIND!); 7 km towards Van Zyl's Pass from Otjitanda, 1300 m, (–DB), 24 February 1999, *Bruyns 8056* (WIND!); Opuwo District, Etengua along road to Otjitanda, 1413 m, (–DB), 31 January 2009, *Rugheimer, Klaassen, Lutombi, Haufiku, Hasheela & Aiyambo 2633* (WIND!); Marble ridge, 2 km north of Onyava [Onyuva], (–DC), 1156 m, 10 January 2004, *Swanepoel SWA3/110* (WIND!); Kunene, (–DC), 28 November 2004, *Curtis BC2191* (WIND!).—1713: Hill south of camp. Ombuku River, (–AD), 12 March 2003, *Curtis BC1976* (WIND!); Ehomba Village, 1176 m, (–BD), 16 January 2004, *Swanepoel 3/114* (WIND!).—1813: Ohohorwa (Poort ± 40 km south of Kaoko-Otavi), (–DA), 17 February 1973, *Owen-Smith & Malan 291* (WIND!); Robbies Pass, (–DA), 1420 m, 31 March 2002, *Curtis, Aronson & Le Floch CUR1659* (WIND!); Robbies Pass, 1360 m, (–DA), 6 January 2004, *Swanepoel SWA3/85* (WIND!); Ohumbameya, 1400 m, (–DA), 6 January 2004, *Swanepoel SWA3/87* (WIND!).

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