



A new species of *Combretum* sect. *Ciliatipetala* (Combretaceae) from South Africa

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Abstract

Combretum eugeneanum, a new species from northeastern KwaZulu-Natal, South Africa and confined to the Maputaland Centre of Plant Endemism, is described, illustrated, mapped, and compared with southern African members of the genus with which it may be confused. In a narrowly defined genus *Combretum*, the new species belongs to *Combretum* sect. *Ciliatipetala*. In herbaria, it has usually been confused with close relatives *C. apiculatum* and *C. edwardsii*, as well as several other more distantly related members of the genus, in particular *C. woodii*. The new species is also closely related to the recently described *C. stylesii*. It is readily distinguished as an essentially glabrous woody climber or scrambling shrub needing other vegetation for support, leaf apices rarely apiculate, tertiary veins raised on the adaxial leaf surface, inflorescences few-flowered and subcapitate, upper hypanthium cupuliform, flowers with orange-red centres (discs) and peltate scales comprised of essentially eight radial cells, most of which are subdivided by at least one tangential wall, the resulting outer and inner cell(s) often with at least one additional radial wall. *Combretum eugeneanum* grows in Sand Forest and associated sandy bushveld, and its range and habitat does not overlap with that of *C. edwardsii* or *C. stylesii*, both of which are also very often lianas.

Keywords: anatomy, Combretoideae, *Combretum eugeneanum*, endemism, Maputaland Centre of Endemism, peltate scales, scales, taxonomy

Introduction

Combretum Loefling (1758: 308) belongs to Combretaceae subfam. Combretoideae, tribe Combreteae (Engler & Diels 1899). The genus, when broadly defined, comprises about 276 species (POWO 2019) with a pantropical distribution mainly in tropical Africa and Asia, but absent in most of Australia and the Pacific Islands (Stace 2007; Mabberley 2017). The centre of diversity of the genus is on the African continent. If a narrow generic definition is used instead, and *Quisqualis* Linnaeus (1762: 556) and other segregate genera are excluded, about 252 species are included in *Combretum*.

Members of *Combretum* include trees, shrubs and woody climbers. The leaves are opposite, whorled (especially ternate), sub-opposite or rarely alternate, entire, lack stipules or stipules very small; and petioles sometimes persist and form \pm hooked spines. Flowers are bisexual, actinomorphic, 4- or 5-merous; the petals variously developed and coloured; the stamens twice as many as the petals, in 1 or 2 series; the ovary inferior and the fruit 4- or 5-winged (rarely an unwinged nut).

In the *Flora of southern Africa* (FSA) region (Namibia, Botswana, South Africa, Eswatini and Lesotho), 33 species of *Combretum* (narrowly defined and excluding one *Quisqualis* species) occur (Maurin *et al.* 2010; Jordaan *et al.* 2011b). In the present contribution we follow the traditional narrow concept of the genus. *Combretum* consists of three subgenera (Exell & Stace 1966): Subgen. *Combretum* comprises species with subsessile, peltate scales, in addition to unicellular, compartmented, non-glandular hairs with a basal compartment (= combretaceous hairs), but without glandular hairs, flowers usually 4-merous (petals usually not red); Subgen. *Cacoucia* (Aublet 1775: 450) Exell & Stace (1966: 10) includes species without scales, but with microscopic short, capitate, stalked glands, in addition to combretaceous hairs, and flowers 5-merous, or if 4-merous then petals usually red (Exell & Stace 1966; Exell 1978);

Subgen. *Apetalanthum* Exell & Stace (1966: 11) is monotypic and the single species has combretaceous hairs, stalked glands and scales, lacks petals, and occurs in Southeast Asia.



FIGURE 1. *Combretum eugeanum*. A. Trunk of a plant reaching the Sand Forest canopy at False Bay Park, Hluhluwe. B. Flowers at Tembe Elephant Park; note orange-red disc. C. Fruiting branchlet at Ndumo Game Reserve. Photograph taken in March when samaras fully grown, but before drying during autumn and early winter. Note glutinous seed pod. Photographs: R.G.C. Boon.



FIGURE 2. *Combretum eugeanum*, leaf and scale morphology. A. Leaves, showing adaxial (top) and abaxial (bottom) lamina surfaces. Note the thin glutinous (shiny) secretion on the lamina surfaces and raised tertiary veins on the adaxial surface. B. Selection of scales (stained with Sudan IV) from leaves of the same collection (*Ward 1970*) to show variation in size, shape and number of cells. Scale bar in mm refers to leaves; one in μm to scales. Photographs: R.G.C. Boon (leaves) and A.E. van Wyk (scales).

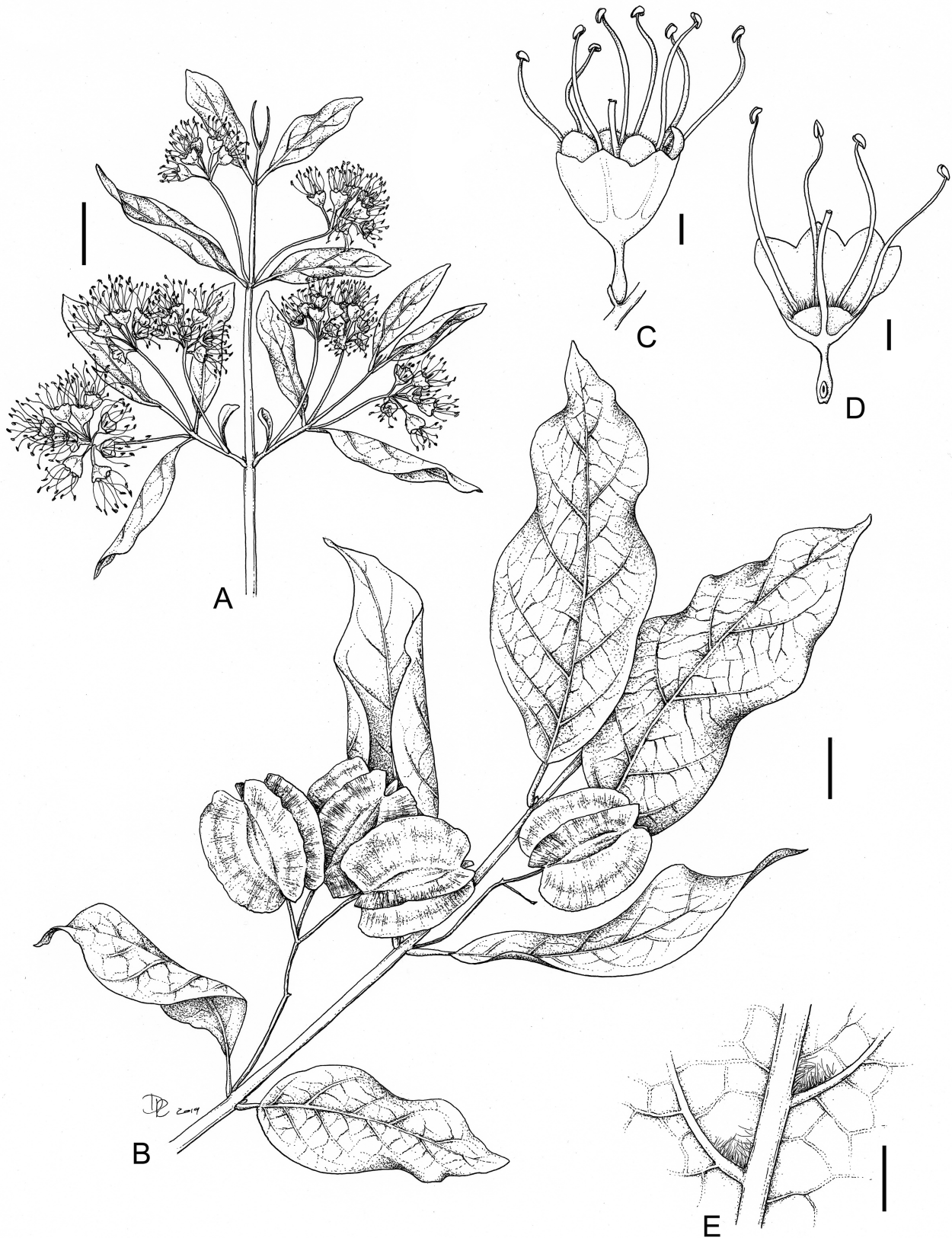


FIGURE 3. *Combretum eugeneanum*. A. Flowering branchlet. B. Fruiting branchlet. C. Flower. D. Flower with half removed. E. Hair-tuft domatia in principal lateral vein axils of abaxial leaf blade surface. Scale bar = 10 mm (A & B), or 1 mm (C–E). A based on *Ward 2644*, B based on *Moll 5632*, C based on *Ward 2661*, D based on *Moll 4359*. Artist: Daleen Roodt.

Combretum subgen. *Combretum* comprises 11 sections in continental Africa (Maurin *et al.* 2010; Jordaan *et al.* 2011a). The new species described here belongs to the diverse and taxonomically difficult section *Ciliatipetala*

Engler & Diels (1899: 32). This section is characterized by species with very small petals, 0.5–1.5 mm long, petal apices ciliate or pilose, except *C. petrophilum* Retief (1986: 44) and *C. psidioides* subsp. *glabrum* Exell (1968: 18), leaf apices often apiculate, flowers with disc margins short, free and pilose, fruit 4-winged, 15–30 mm long, scales relatively small, from 40–120 µm diameter, scattered, not overlapping (Maurin *et al.* 2010; Jordaan *et al.* 2011a). According to Stace (1980) this section comprises ten species and is restricted to Africa and the Arabian Peninsula. Gere *et al.* (2015), studying the origin of the family Combretaceae on the African continent, hypothesized that within subgenus *Combretum*, the most diverse section *Ciliatipetala* diverged ca. 13.2 mya and split into two main subclades, one comprising mainly southern African species and the other with species from the rest of Africa.

Molecular phylogenetic studies done on the Combretaceae by Maurin *et al.* (2010) showed that there are at least three undescribed species in *C.* sect. *Ciliatipetala*. One of these, (*C. sp. nov.* B), from the Tugela River Valley in KwaZulu-Natal, has since been described as *Combretum stylesii* Maurin *et al.* (2011: 106). A second species from Maputaland was provisionally referred to as *C. sp. nov.* C in Maurin *et al.* (2010) and the earliest known herbarium specimen was collected by Father Jacob Gerstner in 1944 (*Gerstner 4953* in PRE). Specimens of this taxon have sometimes been identified in herbaria as a possible new species of *Combretum*, but more frequently as *C. apiculatum* Sonder (1850: 45), *C. edwardsii* Exell (1968: 19) or *C. woodii* Dümmer (1913: 181), and occasionally as one of at least six other species of *Combretum*. The purpose of this paper is to formally describe this new species as *C. eugeneanum*.

Materials and methods

The morphological description was made by the standard herbarium procedures examining specimens of the following herbaria: BNRH, NH, NU, PCE, PRE, PRU and UDW (acronyms according to Thiers 2018). One of us (RGCB) visited the distribution area several times to make field and morphological observations. Godfrey Lang, a landowner near Hluhluwe, assisted with daily observations over eight weeks of a plant breaking dormancy and flowering in the spring of 2019. Descriptors used to indicate abundance and frequency follow Schmid (1982).

The distribution map was constructed using coordinates provided on or derived from specimen labels. In the section “Additional collections (paratypes)”, locality citations were reproduced as per the specimen labels. In some cases the spelling of the locality name was corrected and is shown in square brackets. Specimens are arranged according to the Degree Reference System proposed by Edwards & Leistner (1971); the quarter degree grid reference is supplied between brackets after each locality cited. The distribution map was compiled from specimen data using ArcView 3.1 software. The original base map is based on the GTOPO30 global digital elevation model, and colours were modified in Global Mapper v6.06.

A preliminary conservation assessment was conducted using the standard procedures based on IUCN guidelines (IUCN 2012). GeoCAT (Bachman *et al.* 2011) was used to estimate Extent of Occurrence (EOO) and Area of Occupancy (AOO) using a 2 km and 5 km cell width.

To study the structure of the peltate scales, young, still conduplicate leaves were removed from herbarium specimens and rehydrated by heating in distilled water. The rehydrated but intact leaves were then stained in a 1% solution of Sudan IV in 70% ethanol for at least 24 h (Stace 1965). Following staining, the surface of the leaves was gently scraped with a razor blade to collect some scales, taking care not to cut through the surface itself. Material collected along the edge of the blade was mounted (temporarily) by suspending it in a drop of glycerol on a slide. After applying a cover slip, the preparation was viewed under a light microscope. When comparing the structure of scales in *Combretum*, it is important to note that depictions of scales by means of line drawings provided by Stace (e.g. 1969) tend to be semi-diagrammatic. Those supplied by Verhoeven (1969) (also presented in Verhoeven & Van der Schijff 1973), and for section *Angustimarginata* Engler & Diels (1899: 25) by Van Wyk (1984) are more realistic.

Taxonomic treatment

Combretum eugeneanum R.G.C.Boon, Jordaan & A.E.van Wyk, *sp. nov.*, (Figs. 1–3)

Diagnosis:—Closely related to *Combretum apiculatum*, but easily distinguished from this species by being a scrambling shrub to woody climber (*vs.* usually a single-stemmed tree up to 8 m tall with a rounded canopy), leaf apex acute to obtuse, sometimes acuminate,

very rarely apiculate (*vs.* leaf apex always apiculate), inflorescence a few-flowered subcapitate spike of up to 15(–16) flowers, flowers compactly arranged (*vs.* an elongated many-flowered spike with about 25 flowers), upper hypanthium cupuliform (*vs.* campanulate), fruit 18–20 × 22–24 mm (*vs.* 20–30 × 15–25 mm), and scales of 8 radially arranged cells with most of these cells usually subdivided by at least one tangential wall, the resulting outer and inner cell(s) often with at least one additional radial wall (*vs.* usually simple 8-celled). Also related to *C. edwardsii* and *C. stylesii*; all three being scramblers or climbers, but the range of *C. eugeneanum* does not overlap and habitat differs. Older growth of the new species is almost totally glabrous, whereas *C. edwardsii* and *C. stylesii* have leaves, petioles and branchlets with dense hairs. Additionally, in *C. edwardsii* the red-brown scales are visible with the naked eye and the inflorescence is an elongated spike, whereas in *C. eugeneanum* the scales are invisible without magnification and the inflorescence is subcapitate.

Type:—SOUTH AFRICA. KwaZulu-Natal: Ndumu [Ndumo], 2632CC [2632 CD], 21 November 1967, *Strey & Moll 3758* (holotype NH; isotypes K, PRE).

Combretum sp. nov. in Boon (2010: 408).

Illustrations: Boon (2010: 409, *Combretum sp. nov.*, three photographs in second row from top).

Deciduous, multi-stemmed, scrambling shrub, or often a woody climber reaching the canopy when growing in forest, up to 7(–12) m tall, main stem(s) to 135 mm diameter (Fig. 1A); branchlets terete, glabrous; ultimate shoots slender and twining, usually sparsely hairy when very young (at least the first internode). *Bark* ± grey and smooth on young plants becoming rougher and flaking in small pieces (Fig. 1A), bark on branchlets pale grey with black spots. *Leaves* opposite, rarely 3-whorled (*Moll 5632* in NH), nearly always glabrous when mature, new growth on the same plant may be glabrous or pilose with white combretaceous hairs (unicellular, non-glandular hairs with a basal compartment), hairs mostly lost within 4 weeks, inconspicuous hair-tuft domatia present in some vein axils on the abaxial surface (Fig. 3E) and a few combretaceous hairs may be present on the midrib below; coppice growth hairy; new leaves reddish bronze becoming pale bronze-green, thin, shiny, membranous and somewhat viscid, lamina in young growth narrowly elliptic to oblong, 20–30(–40) × 10–16 mm, apex rounded to retuse, rarely attenuate or apiculate, base rounded; older growth with leaves (Fig. 2A) mid green above, slightly paler with a yellowish wash and somewhat shiny below, becoming orange-red in autumn and winter before falling, coriaceous, lamina elliptic, ovate, obovate or lanceolate, (22–)30–80(–90) × 7–30(–40) mm, apex tapering into a short to long obtuse point or acuminate, rarely apiculate, base cuneate, rounded to sometimes slightly lobed, margin entire and flat, slightly undulate in mature leaves, lamina often revolute especially in new leaves and again in the dry, winter season; midrib sunken above, prominently raised below, secondary and tertiary reticulation prominently raised on adaxial surface, reticulation less obvious below than above, 4–7 pairs of principal lateral veins, looping before reaching the margin; petiole 2–4 mm long, glabrous or with few hairs, scaly. *Axillary bud* prominent, ± 1 mm long, black. *Scales* (Fig. 2B) best seen under magnification on very young leaves, scattered, not overlapping, about (50–)60–90(–110) µm in diameter, with round to slightly undulate margins, often concealed by glutinous secretions, comprised of essentially 8 radial cells but most of these subdivided by at least one (occasionally more) tangential wall, and the resulting outer cell often with at least one additional radial wall, resulting in 8–16 marginal cells, the latter squarish or tangentially elongated, the resulting inner cell(s) sometimes with one additional radial wall, resulting in usually 8–10 inner cells. *Inflorescences* (Fig. 1B & 3A) short, axillary, subcapitate spikes, ± 8–15(–16)-flowered, glutinous; rachis ± 10(–20) mm long; peduncle 15–21 mm long, glabrous, scaly; bracts filiform, caducous, ± 0.5 mm long. *Flowers* (Fig. 3C & D) 4-merous, creamy-white to greenish white with an orange-red centre (disc), strongly sweetly scented (*Ward 2644* in PRE). *Lower hypanthium* ± 1.5–2.0 × 1 mm, scaly. *Upper hypanthium* cupuliform, ± 1.5 mm long, scaly. *Sepals* ± widely deltoid, ± 0.5 mm long, usually tinged reddish purple. *Petals* narrowly spatulate, ± 1.5–2.5 × 1.5 mm, glabrous or with a few scattered hairs on the margin at apex. *Stamens* 8, ± 1-seriate, inserted shortly above the margin of the disc; filaments ± 6 mm long; anthers ± 1 mm long. *Disc* free for ± 0.5 mm; glabrous with a pilose margin. *Style* ± 5 mm long. *Fruit* (Figs. 1C & 3B) a 4-winged samara, sub-circular in outline, 18–20(–22) × (20–)22–24 mm, lime-green becoming golden or yellowish brown and sometimes pink- to red-tinged towards the margins of the wings, glutinous especially towards the seed pod, glabrous, except for a few scales, or sometimes with a few scattered hairs, ultimate ends of wings papery; stipe up to 6 mm long; apical peg usually present, ± 0.5 mm long.

Phenology:—Flowering is in late spring, mainly in October and November, and is apparently triggered by rainfall with anthesis about 10 days after good rain. Fruit ripen from February to July.

Etymology:—The specific epithet honours Eugene John Moll (1941–), eminent South African plant ecologist and author of books on tree identification. He has undertaken vegetation studies in, amongst others, KwaZulu-Natal, where he has collected many herbarium specimens from Maputaland, several of which turned out to be new records, or new taxa (Glen & Germishuizen 2010).

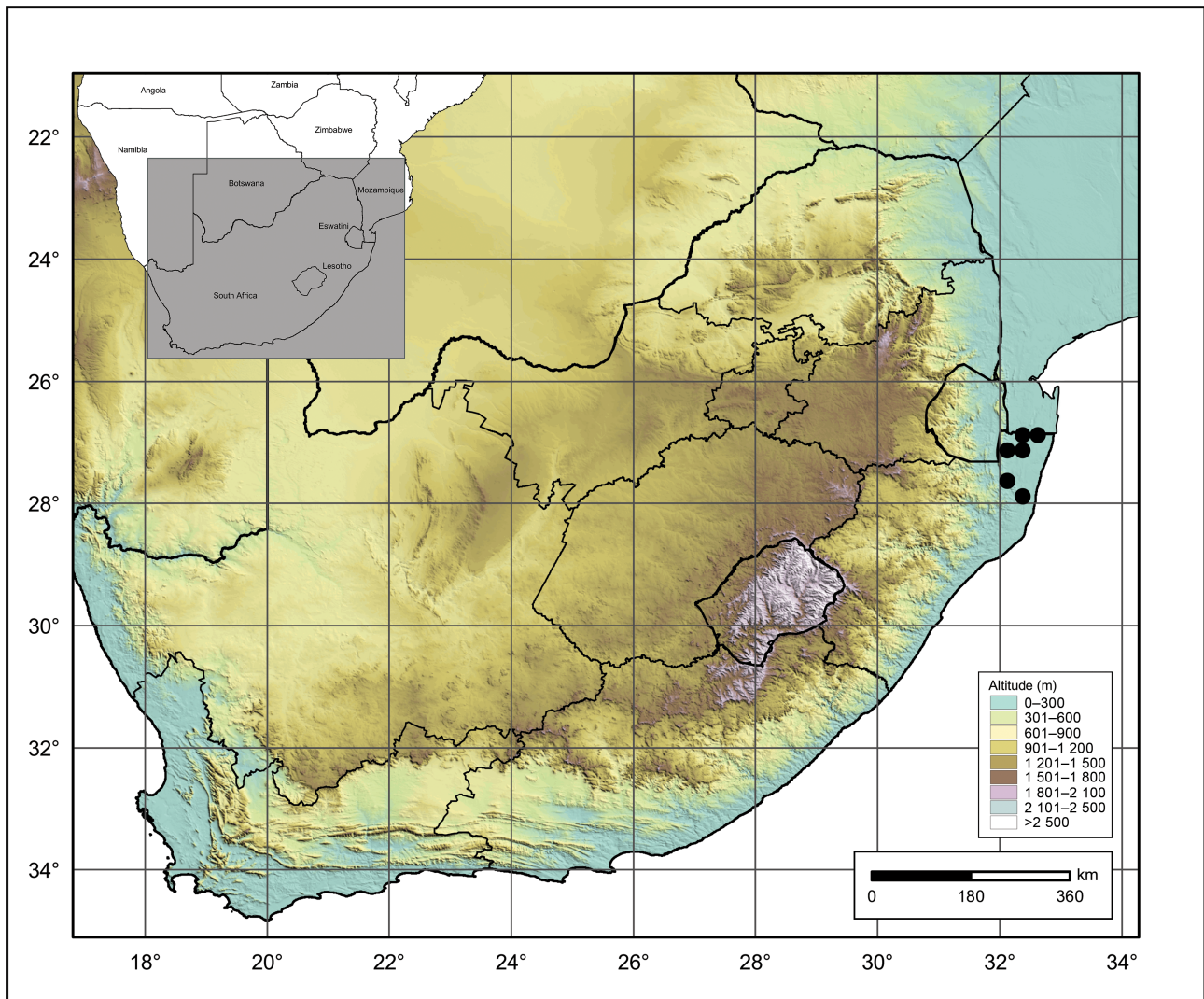


FIGURE 4. Topographical map showing the known distribution (black dots) of *Combretum eugeneanum* in northeastern KwaZulu-Natal, South Africa. Map based on herbarium collections in BNRH, NH, NU, PCE, PRE, PRU and UDW. The insert shows a map of southern Africa with names of countries; the grey rectangle indicates the area depicted by the topographical map.

Distribution:—*Combretum eugeneanum* is endemic to the Maputaland Centre of Endemism, an area rich in restricted-range plants and animals (Van Wyk 1996; Van Wyk & Smith 2001). The Maputaland Centre is at the southern end of the tropics in Africa (Van Wyk 1996) and at the northern end of the Maputaland-Pondoland-Albany Hotspot, one of 36 global biodiversity hotspots (Steenkamp *et al.* 2004). The species is recorded to occur from False Bay Park (part of the iSimangaliso Wetland Park) northwards to the KwaZulu-Natal border with Mozambique. The range includes Phinda Private Game Reserve, Mkhuze Game Reserve, Tembe Elephant Park and Ndumo Game Reserve and the corridor between the latter two conservation areas. The species almost certainly occurs in the far south of the Mozambican part of the Maputaland Centre, but it is yet to be recorded there (Schmidt 2018; H. Matimele pers. comm. 4 August 2019).

Ecology:—*Combretum eugeneanum* grows in sandy soil at low elevations to about 100 m above sea level in Sand Forest (FOz 8), Tembe Sandy Bushveld (SVI 18) and possibly marginally in Western Maputaland Sandy Bushveld (SVI 19) (codes of vegetation types follow Mucina & Rutherford 2006 and South African National Biodiversity Institute 2018).

Larvae of two species of Lepidoptera were observed by G. Lang on a specimen of *C. eugeneanum* growing near False Bay Park, Hluhluwe, in October and November 2019 (Fig. 5). One species was gregarious and fed on epiphytic lichen on the bark of the tree and an adjacent tree species (Fig. 5B). They were tentatively identified as belonging to family Erebidae, subfamily Lymantriinae or perhaps to Lasiocampidae (H.S. Staude pers. comm.). The second species (Fig. 5A) fed on the leaves of *C. eugeneanum* and was identified as *Desmeocraera vernalis* Distant (1897: 205) (family

Notodontidae, subfamily Dicranurinae), which is only known to feed on a number of *Combretum* species (H.S. Staude pers. comm.).

Globose apical galls with a diameter of ± 4 mm were found by G. Lang on the same specimen on which the two specimens of Lepidoptera were found. Young galls are green while older galls turn brown and have large exit holes; the causative agent is still unknown.

Common names:—Maputaland climbing bushwillow; *maputalandrankboswilg* (Afrikaans).

Conservation status:—The EOO of *C. eugeneanum* was estimated at 2209 km² and the AOO as 72 km² for the 2 km cell width recommended by the IUCN Standards and Petitions Committee (2019), and 400 km² for a 5 km cell width. Given the relatively small number of collections of this species, the larger figure may give a better sense of the true AOO.

While the species is mostly known from protected areas, where it can be locally common, plants growing outside of these areas, e.g. south of Ndumo Game Reserve and in the eMbangweni Corridor between Ndumo Game Reserve and Tembe Elephant Park, are threatened by ongoing land transformation and degradation. This has, without doubt, led to continuing declines in the EOO, AOO, extent and quality of habitat, number of mature individuals, and number of locations and subpopulations. The species is largely confined to Sand Forest and its margins, and this vegetation type is limited in extent and highly fragmented. *Combretum eugeneanum* may occur in patches smaller than required to support a viable population in the long-term and sub-populations are separated from other suitable habitat patches by large distances. The total population of *C. eugeneanum* is therefore probably severely fragmented (IUCN Standards and Petitions Committee 2019). The species also likely occurs at more than five but less than ten locations, as defined by the IUCN (2012).

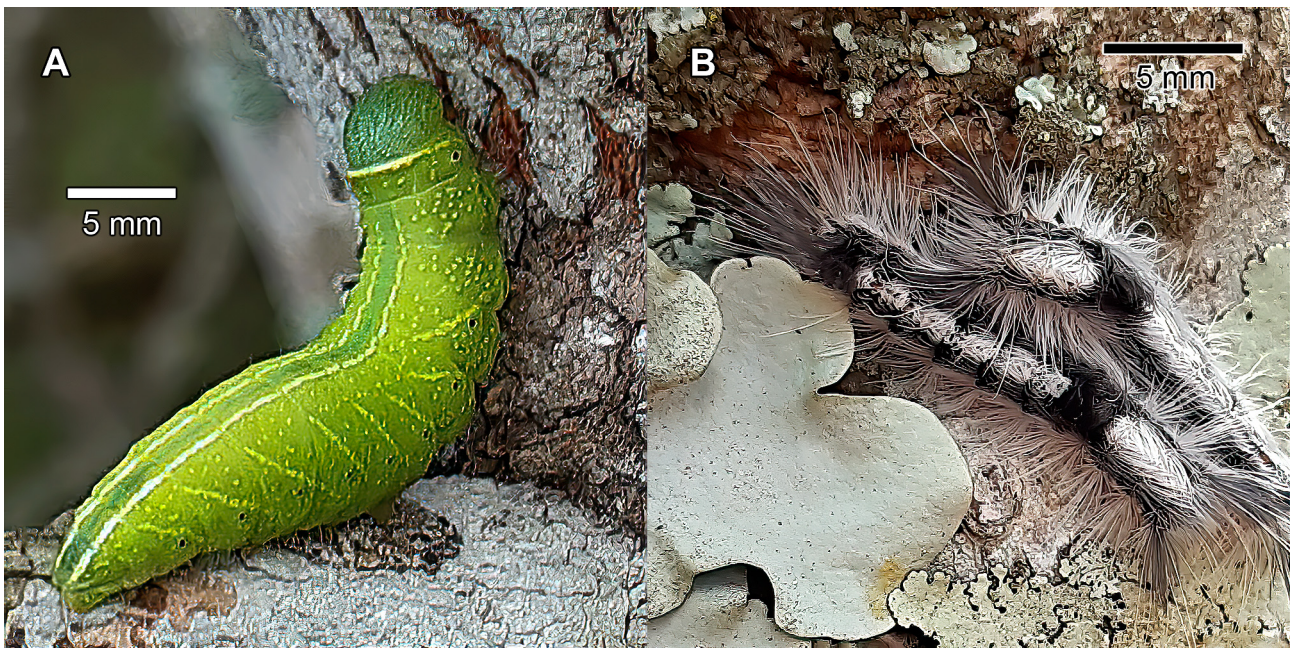


FIGURE 5. Lepidoptera recorded on *Combretum eugeneanum*. A. Larva of the moth *Desmeocraera vernalis* (family Notodontidae, subfamily Dicranurinae), hitherto only recorded as using members of *Combretum* as food plant. B. Hairy larvae of a moth that probably belongs to family Erebidae, subfamily Lymantriinae, feeding on bark-growing lichens. It is not host-plant specific and larvae were also seen feeding on the bark of other tree species. Photographs: G. Lang.

Taking into account uncertainty and the EOO, AOO, continuing decline, number of locations and population fragmentation, application of the IUCN Red List Categories and Criteria (IUCN 2012) suggest that the species could be classified in the range Endangered to Near Threatened. Considering that it is known from less than ten locations, and taking a conservative approach to calculating the AOO, suggests that the species should be classified as Vulnerable (VU) B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv).

Additional collections (paratypes):—SOUTH AFRICA. **KwaZulu-Natal:** Ndumu [Ndumo] Game Reserve, (2632CD), 24 January 1964, *Tinley 875* (NH!, NU!, PRE!, UDW!); Ndumu [Ndumo] (S.), (2632CD), 22 November 1967, *Nicholson 628* (NH!, PCE!); Ndumu [Ndumo] Game Reserve, (2632CD), 5 March 1971, *Moll 5362* (NH!, PRE!); 3 km SE of Nalumu [Ndumo] Police Station, (2632CD), 2 June 1972, *Stephen 749* (PRE!); Tembe Elephant Park, (2632CD), 17 March 1987, *Ward 1970* (NH!, PRE!, UDW!); Ndumo Game Reserve, (2632CD), 8 November

1989, *Ward 2661* (NH!, PRE!); Western boundary of Tembe Elephant Park in corridor area between Tembe and Ndumo, (2632CD), 28 October 1993, *Van Wyk 1324* (NH!); Tembe Elephant Park, northern part of Gowanini Loop, when travelling in a clockwise direction just before the track turns eastwards on sand forest margin, (2632CD), 9 November 2008, *Boon 21* (NH!); Tembe Elephant Park, (2632DC), 7 June 1995, *Van Wyk BSA2983* (NH!); 16 miles Ndumu [Ndumo]/Ingwavuma, (2732AA), 6 November 1969, *Moll 4359* (NH!, UDW!); 16 miles Ndumu [Ndumo]/Ingwavuma, (2732AA), 6 November 1969, *Moll 4360* (NH!, UDW!); 2 km West of Makane's, (2732AA), 6 March 1972, *Moll 5632* (NH!, PRE!); Makane's Pont, (2732AA), 7 March 1972, *Nicholson s.n.* (PCE!); 1 km W of Makane's Pont, (2732AA), 7 June 1972, *Moll & Muller 5682* (NH!, PRE!); Makane's Pont, (2732AA), 7 June 1972, *Nicholson s.n.* (PCE!); 2.5 km E of Makane's Drift on road to Maputa, (2732AA), 10 July 1973, *De Winter 9451* (PRE!); Sihangwane Forest (Central Tongaland), (2732AB), 9 March 1959, *Tinley 426* (NH!, NU!, PRE!); Ulukhondo Forest, Ndumu [Ndumo] Game Reserve, (2732AB), 10 October 1959, *Tinley 504* (NH!, NU!, PRE!); Manungwane Forest, NE of Sihangwane Store, (2732AB), 6 February 1964, *Tinley 919* (NU!, UDW!); Sihangwane Store, (2732AB), 10 November 1969, *Moll 4411* (NH!, PRE!, UDW!); Tembe Elephant Reserve, (2732AB), 24 May 1984, *Ward 705* (NH!, UDW!); Tembe Elephant Park, (2732AB), 2 November 1989, *Ward 2644* (NH!, PRE!); Maputaland, corridor between Ndumu [Ndumo] and Tembe Parks, 8 km N of tar road to Kosi Bay, (2732AB), 10 March 1993, *Van Wyk BSA681* (PRE!, PRU!); Tembe area, on road near D1845, (2732AB), 10 May 2001, *Van Wyk & Gavhi 304* (PRE!); Mkuzi [Mkuze] Game Reserve, (2732CA), 17 October 1960, *Ward 3608* (NH!, NU!, PRE!); Mkuzi [Mkuze] Game Reserve, (2732CA), 7 April 1994, *Rushworth 6* (NH!); Mkuzi [Mkuze] Game Reserve, Mahlala area on north of Mkuzi [Mkuze] Game Reserve, on transect 14, (2732CA), 29 November 1995, *Rushworth 23* (NH!); Hlabisa District, False Bay, (2732CD), 27 October 1944, *Gerstner 4953* (PRE!); False Bay, (2732CD), 28 October 1953, *Ward 1637* (NH!, NU!); False Bay Park, (2732CD), 9 July 1961, *Ward 3677* (NH!, PRE!); False Bay Park, (2732CD), 30 November 1961, *Ward 3853* (NH!); E. side of Farm "Shotton 13810", (2732CD), 30 June 1975, *Ward 8791* (UDW!); Mtante 13813, adjacent the Nibela Native Reserve, Ubombo District, (2732CD), 20 April 1981, *Ward 111* (NH!), Farm "Lulubush" partly enclosed by Phinda Resources Reserve, Mkuze, (2732CD), 1 December 2009, *Styles 3389* (BNRH!).

Discussion:—*Combretum eugeneanum* belongs to *Combretum* sect. *Ciliatipetala*. In Table 1 selected features of *C. eugeneanum* are compared with those members of section *Ciliatipetala* with which it has most often been confused. Although vegetatively rather similar to *C. apiculatum* subsp. *apiculatum*, it can immediately be distinguished in being a climber or scrambler with trailing branches, whereas *C. apiculatum* is a free standing shrub or tree. The widespread tropical African and southern African species, *C. molle* Brown (1814: App. 4: lxiv), ex Don (1827: 431) is also closely related to *C. eugeneanum*, according to phylogenetic studies (Maurin *et al.* 2010), but is never confused with the new species as it is mainly a single-stemmed tree and usually has velvety, hairy leaves, at least below, with the venation impressed above, but prominently raised below.

Combretum mkuzense Carr & Retief (1989: 38) and *C. zeyheri* Sonder (1850: 46) also occur in Maputaland, but belong to *Combretum* sect. *Spathulipetala* Engler & Diels (1899: 58). *Combretum zeyheri* does not occur in the same habitat and can easily be separated from the new species by being a free-standing tree with much larger fruit. *Combretum mkuzense* sometimes grows sympatrically with *C. eugeneanum*. It has long, trailing branches, but has leaves with obtuse or occasionally retuse apices, veins on the adaxial surface slightly impressed, an earlier flowering period mainly in September, pale green flowers in short spikes (but longer than the subcapitate ones in *C. eugeneanum*), discs with long hairs, much larger fruits to 50 × 50 mm, and stipes up to 20 mm long (Carr & Retief 1989).

Another species that *Combretum eugeneanum* has been confused with is *C. woodii*. It belongs to *Combretum* sect. *Angustimarginata*, which is a natural group, restricted to southern Africa. Trees in this section can be easily distinguished by being free standing shrubs or trees, with inconspicuous, though characteristic scales divided by 8–16 primary radial walls only (Stace 1969; Van Wyk 1984) and young leaves that are white or creamy without chlorophyll (Parker *et al.* 1992). *Combretum woodii* has larger leaves, usually longer than 120 mm and wider than 50 mm, and leaf margins usually folded upwards (Boon 2010), whereas *C. eugeneanum* has leaf margins folded downwards and inwards (Fig. 2A & 3B).

TABLE 1. Habitat, geographical distribution and selected diagnostic morphological characters of *Combretum eugeneanum* compared with those other southern African members of *Combretum* sect. *Ciliatipetala* with which it has most often been confused.

Characters	<i>C. eugeneanum</i>	<i>C. apiculatum</i> subsp. <i>apiculatum</i>	<i>C. edwardsii</i>	<i>C. stylesii</i>
Habit	robust climber (twining) or scrambler with trailing branches, rarely a straggly tree	free standing shrub or tree	robust climber (twining) or scrambler with trailing branches, rarely a straggly tree	robust climber (twining) or scrambler with trailing branches, rarely a straggly tree
Leaf lamina				
Apex apiculate	rarely	always	rarely	sometimes
Combretaceous hairs	mature growth nearly always glabrous; new growth glabrous or sometimes pilose with whitish hairs (often yellowish in herbarium specimens); coppice growth hairy; hair-tuft domatia present, inconspicuous	young and mature growth nearly always glabrous; hair-tuft domatia present, inconspicuous	present on young and mature growth, dark brown to reddish; domatia absent	present on young and mature growth, whitish or greyish (often yellowish in herbarium specimens), may become glabrescent with age; hair-tuft domatia present, inconspicuous and often obscured by the hairs on the midrib
Scales	essentially 8 radial cells, most of these cells usually subdivided by at least one tangential wall, the resulting outer and inner cell(s) often with at least one additional radial wall (Fig. 2B); whitish or transparent	simple 8-celled (Stace 1969; Verhoeven & Van der Schijff 1975); whitish or transparent	essentially 8 radial cells, most of these cells usually subdivided by at least one tangential wall, the resulting outer and inner cell(s) often with at least one additional radial wall, although degree of subdivision less complex than in <i>C. eugeneanum</i> (Stace 1969; Verhoeven & Van der Schijff 1975); dark brown to reddish	simple 8-celled (Maurin <i>et al.</i> 2011); whitish or transparent
Inflorescence (number of flowers; shape)	usually < 15; subcapitate spike	usually > 20; lax, elongated spike	usually > 30; subcapitate to elongated spike	usually < 10; subcapitate spike
Vegetation types (codes follow Mucina & Rutherford 2006)	mainly Sand Forest (FOz 8) and Tembe Sandy Bushveld (SV1 18)	widespread in many types of savannah throughout southern and south-tropical Africa	Southern Mistbelt Forest (FOz 3), Scarp Forest (FOz 5) and Northern Afrotemperate Forest (FOz 2)	restricted to Eastern Valley Bushveld (SVs 6)
Distribution	range-restricted and endemic to the Maputaland Centre of Endemism (Van Wyk & Smith 2001), more specifically northeastern KwaZulu-Natal, most probably also far southern part of Mozambique; range not overlapping with <i>C. edwardsii</i> and <i>C. stylesii</i> ; where occurring near <i>C. apiculatum</i> , then in different habitat	widespread in northern and northeastern parts of South Africa, also in Botswana, Eswatini, Malawi, Mozambique, Namibia, Zambia and Zimbabwe; not growing sympatrically with the other species compared here except perhaps narrowly with <i>C. stylesii</i> in the far southern end of its range	ranges from Eastern Cape through KwaZulu-Natal and Mpumalanga to Limpopo; not growing sympatrically with the other species compared here	range-restricted and endemic to lower Tugela River Valley, KwaZulu-Natal; not growing sympatrically with the other species compared here (but see note under <i>C. apiculatum</i>)

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