



Keetia magassoubiana sp. nov. (Rubiaceae - Vanguerieae), a threatened evergreen forest climber and an updated key to *Keetia* in West Africa

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Summary. *Keetia magassoubiana* Cheek, an evergreen rainforest climber, is described and illustrated from the Republic of Guinea, Sierra Leone, Liberia and Ivory Coast. Previously indicated as being close to, but different from, *K. tenuiflora* (Hiern) Bridson, it differs in the glossy, black, glabrous, epidermis of the distal stem internodes; the first internode rarely with very sparse, red adpressed hairs (vs epidermis pale white-brown, with dense, pale yellow, spreading hairs); abaxial leaf surfaces with domed domatia with a central aperture (vs domatia absent or obscure); secondary stem leaf bases acute (vs obtuse to truncate); bracts forming a lacinate sheath on the distal peduncle (vs two opposite triangular bracts) and the pyrene surface honeycombed with pits (vs entire). The species was earlier included within *Canthium multiflorum* (Schum. & Thonn.) Hiern, now *K. multiflora* (Schum. & Thonn.) Bridson, in the *Flora of West Tropical Africa*, second edition. An updated key is presented to the 16 species of the genus from West Africa. *Keetia magassoubiana* is provisionally assessed using the IUCN standard as Endangered [EN B1ab(iii)] due to only five of the recorded 14 locations having extant forest habitat, and because of ongoing threats of habitat clearance, mainly for agriculture but also for mining.

Key Words. Conservation, extinction, liana.

Introduction

Keetia E. Phillips (Rubiaceae - Vanguerieae) was segregated from *Canthium* Lam. by Bridson (1985, 1986). This genus, of about 41 accepted species (Cheek & Onana 2024), is restricted to sub-Saharan Africa (excluding Madagascar and the Mascarene Islands) and extends from Senegal and Guinea in West Africa (Gosline *et al.* 2023a; 2023b) to Sudan (Darbyshire *et al.* 2015) in the North and East and S. Africa in the South (Bridson 1986). *Keetia* differs from other African genera of Vanguerieae by its pyrenes with a fully or partly defined lid-like area around a central crest, and endosperm with tanniferous areas (Bridson 1986). *Keetia* species are usually climbers or very rarely shrubby or trees and occur mostly in forest habitats, sometimes in wooded grassland. In a phylogenetic analysis of the tribe based on morphology, nuclear ribosomal ITS and chloroplast *trnT-F* sequences, Lantz & Bremer (2004) found that, based on a sample of four species, *Keetia* was monophyletic and sister to *Afrocanthium* (Bridson) Lantz & B. Bremer with strong support. Highest species diversity of *Keetia* is found in Cameroon and Tanzania, both of which have about 15 taxa (Onana 2011; POWO 2024, continuously updated) and in Gabon, where 10 species are currently recorded (Sosef *et al.* 2006) but around 25 are actually present, many of them undescribed (Lachenaud pers. comm. to

Cheek, 2024). Several *Keetia* species are point endemics and have been prioritised for conservation (e.g. Onana & Cheek 2011; Couch *et al.* 2019; Murphy *et al.* 2023) and one threatened species, *K. susu* Cheek, has a dedicated conservation action plan (Couch *et al.* 2022).

Bridson's (1986) account of *Keetia* was preparatory to treatments of the Vanguerieae for the *Flora of Tropical East Africa* (Verdcourt & Bridson 1991) and *Flora Zambesiaca* (Bridson 1998). Pressed to deliver these, she stated that she could not dedicate sufficient time to a comprehensive revision of the species of *Keetia* outside these areas: "Full revision of *Keetia* for the whole of Africa was not possible because the large number of taxa involved in West Africa, the Zaire basin and Angola and the complex nature of some species would have caused an unacceptable delay in the completion of the above mentioned Floras. [...] A large number of new species remain to be described" (Bridson 1986: 966). Several of these new species were indicated by Bridson (1986), and other new species by her arrangement of specimens in folders that she annotated in the Kew Herbarium. One of these species was later taken up and published by Jongkind (2002) as *K. bridsoniae* Jongkind. In the same paper, Jongkind described and published *Keetia obovata* Jongkind. Based mainly on new material, additional new species of *Keetia* have been published by Bridson

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& Robbrecht (1993), Bridson (1994), Cheek (2006), Lachenaud *et al.* (2017), Cheek *et al.* (2018a), Cheek & Bridson (2019), Cheek & Onana (2024), Cheek *et al.* (2024a) and Cheek *et al.* (2024b) and there are several other specimens that fit no other species (e.g. Cheek *et al.* 2004, 2011) and remain to be described.

In this paper we continue the project towards an updated taxonomic account of *Keetia* by describing a further new species, *Keetia magassoubiana* Cheek. This taxon was first indicated by Bridson (1986) who referred to it as *Keetia* sp. aff. *tenuiflora* (Hiern) Bridson (Bridson 1986: 992). Under *Keetia tenuiflora*, she (Bridson 1986: 984) stated: “The following specimens from Sierra Leone - Scott Elliot 4503 & Thomas 6944 & 7068 - were cited by Hepper in Fl. W. Trop. Afr. ed. 2, 2: 182 (1963) [Hepper & Keay 1963] under *C. multiflorum* (Schum. & Thonn.) Hiern. These, together with more recent collections from Mali, Liberia and the Ivory Coast, are very close to *K. tenuiflora*, but probably represent a distinct infraspecific taxon. This taxon has glabrous stems with dark-coloured bark, while typical *K. tenuiflora* has stems with yellowish adpressed hairs and buff-coloured bark.”

We confirm these results and have found additional characters separating these two taxa, which justifies species rather than subspecies rank for the new taxon (see Table 1). We were not able to find material from Mali and suspect this refers to a specimen of the taxon from Guinea with a misleading

label annotation. Recent collecting has extended the range of the taxon through much of Guinea.

New species to science are continually being described from the range of this new species in W Africa, mainly from the surviving remnants of species-diverse forests. These include species of: climbers, e.g. in *Monanthotaxis* Baill. (Annonaceae, Hoekstra *et al.* 2021), *Cucumis* L. (Cucurbitaceae, Schaefer 2021), *Hibiscus* L. (Malvaceae, Cheek *et al.* 2020a), *Keita* Cheek (Olacaceae, Cheek *et al.* 2024c); small trees and shrubs e.g. in *Noronhia* Stadtm. ex Thouars (Oleaceae, Jongkind 2020), *Tarenna* Gaertn. (Rubiaceae, Jongkind 2021) and *Tabernaemontana* L. (Apocynaceae, Jongkind & Lachenaud 2022); non-chlorophyllous heteromycotrophs e.g. in (*Gymnosiphon* Blume, Burmanniaceae, Cheek *et al.* 2024d); rheophytes e.g. in *Ctenium* Panz., *Inversodicraea* Engl. ex R.E.Fr. and *Saxicolella* Engl. (Xanthos *et al.* 2021; Cheek *et al.* 2017; 2022) and terrestrial herbs e.g. in *Benna* Burgt & Ver.-Lib. (Melastomataceae, van der Burgt *et al.* 2022) and *Trichantheum* Zuloaga & Morrone (Poaceae, Xanthos *et al.* 2020).

Materials and Methods

Names of species and authors follow IPNI (2024, continuously updated) and nomenclature follows Turland *et al.* (2018). Herbarium material was collected using the patrol method e.g. Cheek & Cable (1997). Herbarium

Table 1. Characters distinguishing *Keetia magassoubiana* sp. nov. from *K. tenuiflora* and *K. multiflora*.

	<i>Keetia magassoubiana</i> sp. nov.	<i>Keetia tenuiflora</i>	<i>Keetia multiflora</i>
Range	Guinea to Ivory Coast	Sierra Leone to Uganda	Sierra Leone to SW Nigeria
Habit & habitat	climbers of evergreen forest (rarely shrubs of secondary thicket)	climbers of evergreen forest	shrubs or trees of savanna woodland or thicket
Leaf colour (dried)	subconcolorous, usually black adaxially and dark brown abaxially	subconcolorous, dark brown on both surfaces	discolorous, dark brown adaxially and yellow-green abaxially
Leaf base (secondary stems)	acute	obtuse to truncate	rounded, obtuse or truncate
Tertiary nerves (abaxial leaves of secondary stems)	inconspicuous	inconspicuous	conspicuous, reticulate
Domatia	domed, with a small central aper- ture, glabrous	obscure or absent, rarely present as hair tufts	flat, wide, open pits
Pedicel indumentum	sparse, mainly adpressed hairs	dense, adpressed and spreading hairs	glabrous
Bracts (peduncle apex): number, shape, posture; hairs	1, sheathing, lacerate, the divi- sions irregular, acute, slightly spreading; hairs adpressed	2, each triangular with two lateral adpressed lobes; glabrous	2, hemiorbicular, rounded, entire, spreading; gla- brous
Fruit	strongly didymous, 2.2 – 2.5 cm wide, base notched	strongly didymous, 1.2 – 1.5 cm wide, base notched	weakly didymous, < 1.8 cm wide, base entire
Disc	puberulent	pubescent	puberulent
Style head, length (mm)	0.6 – 0.8	0.25 – 0.5	0.75 – 1.05
Disc (fruit) diam. (mm)	4 – 6	4 – 6	1 – 2
Pyrene surface	honeycombed with pits	rough, but neither pitted nor bumpy	with regular raised bumps

specimens were examined with a Leica Wild M8 dissecting binocular microscope fitted with an eyepiece graticule measuring in units of 0.025 mm at maximum magnification. The drawing was made with the same equipment with a Leica 308700 camera lucida attachment. Pyrenes were exposed by simmering selected ripe fruits in water until the flesh softened and could be removed by scalpel. A toothbrush was then used to clean the pyrene surface to expose the surface sculpture and the lid. Finally, a fine saw was used to cut a transverse section of the fruit and seed, allowing observation of tanniferous cells in the endosperm and measurement of the endocarp thickness. Specimens were inspected from the following herbaria: BM, FHO, HNG, K, P, SL, WAG and YA. All GBIF (<https://www.gbif.org>) images of specimens of *Keetia multiflora* (in which most specimens had previously been included) were checked and additional duplicates of confirmed specimens are recorded in “Specimens Studied” below. One or two additional potential specimens of this species were also viewed on GBIF but image resolution was insufficient to allow confirmation (indumentum and domatia could not be seen in detail). Grid references and altitudes added post hoc, using Google Earth Pro, are indicated in brackets. They were used to assess the continued survival of the species using, as proxy, the continued existence of forest habitat at the collection site, and to calculate Area of Occupancy sensu IUCN (2012) for the conservation assessment. The format of the description follows those in other papers describing new species of *Keetia*, e.g. Cheek *et al.* (2024a). Terminology follows Beentje & Cheek (2003). All specimens indicated “!” have been seen. The conservation assessment follows the IUCN (2012) standard. Herbarium codes follow *Index Herbariorum* (Thiers 2024, continuously updated).

***Keetia magassoubiana* Cheek sp. nov.** Type: Sierra Leone, Northern Region, Southern Sula Mts, Tonkolili Distr., Simbel Hill, western slope, 8°58'11.8"N 11°41'30.8"W, 770 m, fl., 6 Dec. 2009, Robinson 5 (holotype K [K000678056]!; isotypes FBC, SL). Figs 1 & 2.

<http://www.ipni.org/urn:lsid:ipni.org:names:77351288-1>

Canthium multiflorum (Schum. & Thonn.) Hiern sensu Adam (1975: 989), Hepper & Keay (1963: 184) pro parte quoad Scott Elliot 4503, Thomas 6944 & 7068.

Keetia sp. aff. *tenuiflora* (Hiern) Bridson (1986: 992).

Keetia multiflora (Schum. & Thonn.) Bridson sensu Hawthorne & Jongkind (2006: 624) pro parte.

Keetia tenuiflora (Hiern) Bridson (1986: 992) sensu Aké Assi (2001: 78) pro parte quoad Aké Assi 13154 & 5321.

Evergreen forest liana to 8 m high, less usually a shrub of forest-derived thicket c. 3 m tall. *Primary*, orthotropic,

stem terete or rarely slightly angled, drying glossy black, at length dull white, lenticels absent, leaves, and stipules usually absent when reproductive, internodes 6 – 10 × 0.4 – 0.8 cm, glabrous. *Secondary*, plagiotropic, *stems* (spur shoots or brachyblasts) 5 – 35 cm long, with 2 – 11 nodes, slightly ascending when young, as the primary stem, terete, 1 – 2.5 mm diam.; glabrous, or rarely the first internode with inconspicuous sparse thick dull red adpressed hairs, c. 0.5 mm long. *Leaves* strongly dimorphic, opposite, equal, distichous, at anthesis often present only on secondary stems, drying black on upper surface, dark brown on lower, usually leathery, bacterial nodules absent. *Leaves of primary stems* erect, held parallel to the stem, coriaceous, ovate to suborbicular 1.2 – 2.1 × 1.1 – 1.4 cm, apices rounded. Bases truncate, sometimes decurrent to the top of the petiole, secondary nerves white, (1 –) 2 – 3 on each side of the midrib, all arising from the proximal 1/3 – 1/4 of the midrib (subpalmate), glabrous, domatia absent. Petioles canaliculate, adaxial surface broadly concave, 0.3 – 0.55 (– 0.7) × 0.05 – 0.08 cm, with a few sparse slightly spreading hairs. *Leaves of secondary stems* subconcolorous, matt, adaxial surface drying black, abaxial dark brown, narrowly elliptic to oblong, (4.0 –) 5.2 – 8.8 (– 10.5) × (1.6 –) 2 – 3.8 (– 4.2) cm, shortly acuminate, acumens (0.2 –) 0.5 – 1.2 (– 1.9) cm long, apices rounded, margins slightly revolute. Bases acute, slightly asymmetric, one side arising from the petiole 1 – 2 mm above the other; midribs and secondary nerves raised on upper surface (Fig. 1E). Secondary nerves (3 –) 4 – 6 (– 7) on each side of the midrib, nerves arising at c. 70°, straight towards margin, forking at a domatium or arching upwards towards the nerve above forming a weak, looping marginal nerve. Tertiary nerves sparse and inconspicuous. Domatia axillary between midrib and secondary nerves and at divisions of the secondary nerves, sporadic, domed, 0.5 – 0.75 mm diam., glabrous, with a minute central aperture c. 0.1 mm (Fig. 1B); indumentum restricted to the abaxial midrib, sparse, hairs reddish-orange or red, adpressed, stout, straight, c. 0.5 mm long, acute; petiole of secondary stems canaliculate with the adaxial face grooved, (0.4 –) 0.6 – 1.2 (– 1.9) × 0.06 – 0.09 cm, indumentum as midrib. *Stipules* moderately persistent on secondary stems, 3.2 – 7 mm long, very shortly sheathing, bases broadly triangular, 1.2 – 2 × (1.8 –) 2.5 – 3 mm, midrib raised, extended as a more or less cylindrical awn; awn straight, usually elevated and displaced to one side, (3.5 –) 4 – 4.5 × 0.25 – 0.4 mm; indumentum of the outer surface as the secondary shoots, inner surface glabrous, apart from a line of colleters and hairs at the base, sometimes exposed if the whole stipule falls; colleters 5 – 9 per stipule, drying black, glossy, stout, abaxial face flat, 0.7 – 0.9 × 0.2 mm, apices acute or rounded, separated from the stem by a layer of parallel long simple, yellow hairs. *Inflorescence* axillary, on the secondary stems only, held erect, above the stem, in pairs at 4 – 7 successive nodes of leafy

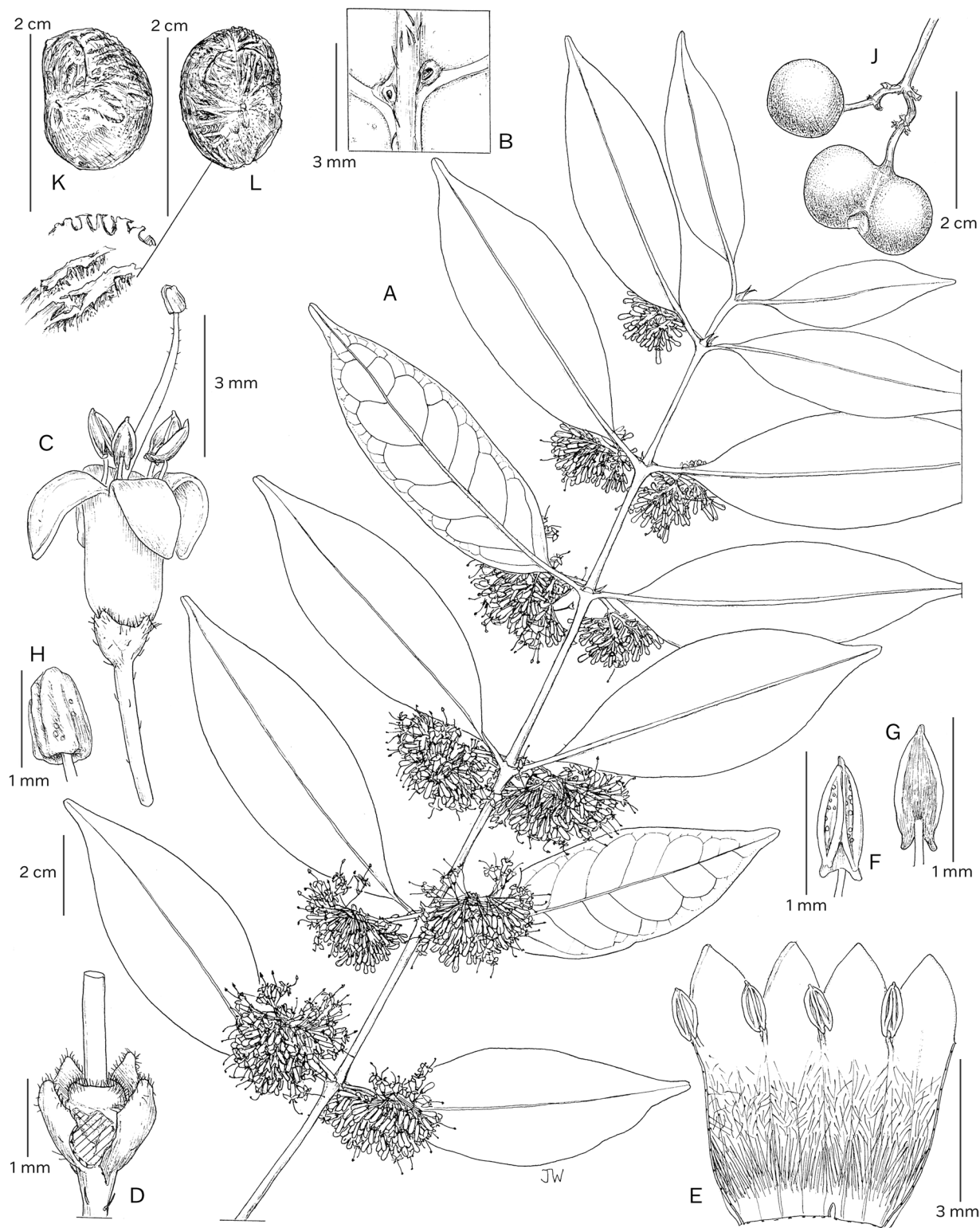


Fig. 1. *Keetia magassoubiana*. **A** habit, secondary, flowering branch; **B** detail of domed domatia and hairs, abaxial leaf surface; **C** flower, side view; **D** flower, corolla removed, calyx opened, showing disc and style; **E** corolla opened showing stamens and indumentum; **F** anther and filament, dorsal view; **G** as **F**, ventral view; **H** style head; **J** fruit both 1-seeded by abortion (top left) and 2-seeded (bottom right) showing accrescent disc; **K** pyrene, side view; **L** pyrene front view, with detail showing excavated surface. **A** – **H** from Robinson 5; **J** from Bidault 2434; **K** – **L** from Jaeger 140. DRAWN BY JULIET WILLIAMSON.



Fig. 2. *Keetia magassoubiana*. Flowering secondary branch on habitat, Sula Mts (Tonkolili) of Sierra Leone, from *Robinson 5* (holotype K; isotypes FBC and SL). The species is now extinct at this site. PHOTO: IAIN DARBYSHIRE.

stems, each (38 –) 50 – 110-flowered; peduncles (0.25 –) 0.3 – 0.55 cm long, glabrous. Bracts inserted 1 – 1.5 mm from apices, collar-like (amplexicaul, sheathing) c. 1 mm long, lacinate, lobes 6 – 7, spreading slightly, narrowly ovate-triangular, margins densely yellow-hairy; partial peduncles (branches) two, 0.2 – 0.3 cm long, subsequent branches short, bearing numerous flower fascicles, and subtending bracteoles. Bracteoles alternate, ovate-lanceolate, c. 1 mm long, decreasing in size distally, indumentum as bracts. Flowers (Fig. 1C) unpleasantly scented of urine. Pedicels 3 – 6.5 × 0.2 – 0.3 mm, with sparse simple, yellow hairs c. 0.2 mm long, spreading, slender. Calyx-hypanthium campanulate, 1 – 1.5 × 1.2 – 1.5 mm, indumentum as pedicel (Fig. 1D), calyx limb tube (0.1 –) 0.3 – 0.4 mm long, lobes 4 (– 5), erect, triangular 0.1 – 0.5 × 0.2 – 0.5 mm, apices rounded to obtuse, indumentum on outer surface as pedicel, densest along margins, inner surface glabrous, collectors not seen (Fig. 1D). Corolla greenish-white, in bud cylindric, c. 3.5 × 1.2 mm, apex rounded; at anthesis tube cylindrical 2.7 – 3.5 × 1.5 mm; lobes 4, about half as long as tube, reflexed, oblong-triangular, 1.6 – 2 × (1 –) 1.3 – 1.5 mm; outer corolla surface glabrous; inner surface of tube with dense, reflexed, straight, simple hairs, 0.9 – 1.2 mm long, originating in a band 0.5 mm wide, 1.5 mm from the base of the tube, leaving the basal c. 0.5 mm of the tube glabrous; the middle part of the tube with shorter, slightly wavy mainly downward-pointing hairs 0.2 – 0.4 mm long, obscuring the surface, reducing in density towards the throat, the distal 0.5 mm of the tube mainly glabrous; inner surface of corolla lobes glabrous (Fig. 1E). Stamens 4 (– 5) inserted just inside the throat, entirely exserted, erect; filaments 0.3 – 0.5 mm long, glabrous, sub-basifixed; anthers subsagittate, 0.8 – 1 × 0.3 – 0.4 mm; connectives flat, brown covering the abaxial surface, extending as a mucro 0.08 mm long (Fig. 1F & G); disc torus-like 0.25 × 0.7 mm, puberulent, hairs patent, 0.8 mm long, dense (Fig. 1D). Style 7 × 0.25 mm, exserted for most of its length, extending beyond the anthers, distal part tapering to 0.1 mm wide and with scattered patent hairs, 0.05 mm long; style-head cylindrical, 0.6 – 0.8 × 0.5 – 0.6 mm, outer surface with c. 10 shallow longitudinal furrows (Fig. 1H). Fruit green when mature, surface smooth, glabrous, glossy, 2-seeded fruits strongly didymous 1.5 × 2.2 – 2.5 cm, with a deep groove on both sides separating the globose carpels, emarginate at base and apex, disc bright white, flat, markedly accrescent, c. 0.5 cm diam., calyx lobes inconspicuous (Fig. 1H); uncarpellate fruits globose, 1.2 – 1.4 cm diam., disc lateral, separated from the pedicel by the vestigial carpel, vestigial carpel domed or broadly conical, c. 2 mm long, c. 3 mm diam.; mesocarp c. 2 mm thick. Pyrene broadly ellipsoid, 1.3 – 1.5 × 1.05 – 1.2 × 1.05 – 1.15 cm, apex and base broadly rounded, ventral surface slightly less convex than other faces, point of attachment central; lid-like area entirely on ventral surface,

semi-circular c. 0.7 × 0.8 cm, the distal, arced perimeter with a deep fissure, the proximal margin transverse, straight, poorly defined, crest and ridges absent; surface of pyrene, including lid, honey-combed with irregularly longitudinal excavations radiating from point of attachment (Fig. 1J & K); endocarp woody 1 – 2 mm thick. Seed ellipsoid, c. 7 × 5 × 5 mm, surface brain like, pale brown; endosperm (in transverse section) with slender tanniferous bands radiating from the central embryo.

RECOGNITION. *Keetia magassoubiana* Cheek sp. nov. is close to but differs from *K. tenuiflora* in the glossy, black, glabrous epidermis of the distal stem internodes, rarely with very sparse red hairs (vs epidermis pale white-brown, densely pale yellow hairy in *K. tenuiflora*), abaxial leaf surface with domatia domed, with a central aperture (vs domatia absent or obscure), the secondary stem leaf bases acute (vs obtuse to truncate), the bracts forming a lacinate sheath on the distal peduncle (vs two opposite triangular bracts) and the pyrene surface honeycombed with pits (vs smooth).

DISTRIBUTION & HABITAT. Lowland evergreen forest, rarely submontane. It has also been recorded once in secondary forest and once in secondary thicket. Alt. range 15 – 960 m.

CONSERVATION STATUS. *Keetia magassoubiana* has a wide geographic range but within this range it is infrequent and rarely collected, being recorded from a single specimen at most of the 12 recorded localities, and sites being widely separated. Its survival is threatened by clearance of its severely fragmented forest habitat. Over 90% of original forest was considered lost in Guinea and Sierra Leone by the end of the 20th Century (Sayer *et al.* 1992). In Ivory Coast, 80 – 90% of surviving forest was lost in the period 1950 – 1980 (Riezebos *et al.* 1994). Historic sites for the species in Sierra Leone such as Kumrabai, where it was recorded in 1914 by N. W. Thomas (*N. W. Thomas* 7068, K!) are now entirely devoid of any of original forest habitat, which has been replaced by vast areas of oil palm cultivation (observed on Google Earth Pro, <https://www.google.co.uk/earth/>, accessed 15 June 2024). The species is also extinct at its only known locality in the Sula Mts of Sierra Leone due to open-cast iron ore mining at the Tonkolili project managed since 2020 by the Kingho mining company (<https://www.mining-technology.com/projects/tonkolili-iron-ore-mine/>, accessed 15 June 2024). Recorded at Tonkolili in 2009 (Robinson 5) through an environmental impact assessment before mining began, the site of the specimen collection is now entirely denuded of vegetation (Google Earth Pro imagery observed June 2024).

At the eastern end of its range, the Adiopodoumé Forest in Ivory Coast, from which this species was recorded in the 1950s to 1970s, it is also likely extinct. There, its forest habitat has been lost due to

anthropogenic disturbances, such as the felling of trees for commercial purposes, land clearing for agriculture and uncontrolled urbanisation which have also led to the extinction of other species (Laurent 2020).

However, the species is likely to survive at its site in the Tai Forest of Ivory Coast, which is considered well protected, and at Mt Bero in Guinea, a designated Important Plant Area (Couch *et al.* 2019; Darbyshire *et al.* 2017). In total it is thought to survive at five known sites, being lost from c. seven sites and with the locality of one site ‘sources du Niger’ not pinned down.

Here it is assessed as Endangered [EN B1ab(iii)] in view of its Area of Occupancy of 20 km², five locations and extreme human-induced habitat fragmentation and ongoing threats. One surviving site was included in an environmental impact assessment of a proposed mine and another two locations are entirely unprotected in a region where, even in protected areas, virtually all natural habitat is at risk of clearance for development.

SPECIMENS EXAMINED. GUINEA (CONAKRY). Gallery forest at the source of the Niger, fr., 1 Oct. 1944, *P. Jaeger* 140 (K [K001900250]!); **Boké**, Boffa Préfecture, 10°25'23"N 14°19'07"W, 112 m, fr., 18 Oct. 2016, *E. Bidault* 2434 (K [K000593387]!, MO); **Nzérékoré Préfecture**, between Lamineta village and Mont Kouoye, 8°12'50"N 8°37'53"W, 960 m, fl., 22 Nov. 2008, *F. Fofana* 170 (HNG, K [K000615446]!, SERG, WAG). **SIERRA LEONE. Kukuna**, (9°8'28.4"N 12°39'52.1"W, 56 m), fl., 17 Jan. 1891, *Scott Elliot* 4503 (K [K000874710]!); **Kumrabai**, (8°41'23.9"N 13°7'54.3"W, 15 m), 31 Dec. 1914, *N. W. Thomas* 7068 (K [K000874711]!); (8°41'23.9"N 13°07'54.3"W), 1 Dec. 1914, *N. W. Thomas* 6944 (K [K000874712]!); **Tonkolili**, Northern region, 8°58'11.8"N 11°41'30.8"W, 770 m, fl., 6 Dec. 2009, *E. Robinson* 5 (holotype K [K000678056]!; isotypes FBC, SL); Northern region, (8°58'51.6"N 11°47'52.8"W), 128 m, fl., 1 Dec. 1950, *E. L. King*, 199 (K [K000593371]!); **LIBERIA. Nimba**, Grassfield, 7°29'N 8°34'W, 560 m, fr., 16 May 1970, *J. G. Adam* 25533 (K [K000874719]!, P! [P03938759]!); Mt Nimba, Forest edge area, 7°32'N 8°33'W, 500 m, fl., 15 Dec. 1966, *J. J. Bos* 2436 (WAG [WAG.1312264]!, K [K000874722]!); **Lofa**, Gbarnga-Zorzor Road, West bank of St. Paul, 7°19'N 9°30'W, 285 m, 20 Dec. 1966, *J. J. Bos* 2489 (BR, WAG [WAG.1312262]!, K [K000874720]!); **IVORY COAST. Adiopodoumé**, Adiopodoumé Forest, (5°21'N 4°08'W), 60 m, 11 Feb. 1958, *Aké Assi* 5321 (K [K000874726]!); Adiopodoumé Forest, (5°21'N 4°08'W), 60 m, 12 Dec. 1959, *Aké Assi* 5454 (K [K000874727]!); Adiopodoumé Forest, (5°19'53"N 4°08'02"W), 40 m, 17 May 1964, *Leewenberg* 4191 (WAG [WAG.1312205]!, K [K000874729]!); **Soubré**, Taï National Park, (5°46'N 6°54'W, 195 m), 18 Dec. 1975, *Aké Assi* 13154 (K [K000874728]!).

ETYMOLOGY. Named for Dr Sekou Magassouba, Director-General of the National Herbarium of Guinea (HNG) in the University of Gamal Abdel Nasser – Conakry, Republic of Guinea. Under his

careful, tireless and diligent administration, HNG has increased greatly in its capacity to devise and manage projects, attract grants, to train students, including now at doctorate level for the first time and to develop publication of research and publicise the conservation of the threatened plant species and habitats of his country.

PHENOLOGY. Flowering late Nov. and Dec. Fruiting Feb. – May.

VERNACULAR NAMES AND USES. Neither are known.

NOTES. *Keetia magassoubiana* is recognised by its relatively small, seemingly glabrous narrowly elliptic-oblong leaves which dry black, as do the stems. Under the microscope, the petioles and lower surfaces of the leaf midribs can be seen to have sparse, thick, adpressed, reddish-orange hairs c. 0.5 mm long. In some specimens, these hairs extend to the first internode of the stem. The domatia, sporadic in the axils of the midrib and secondary nerves and bifurcations, are unusual, being domed, glabrous, with a minute apical aperture. The secondary nerves proceed to the margin in a straight line until they abruptly fork, or angle upward to the nerve above, from occasional domatia.

The fully formed fruits of *Keetia magassoubiana* are relatively massive, c. 2.2 – 2.5 cm broad, glossy and deeply bilobed, as are those of *K. abouabou* Cheek (a local coast endemic of Abidjan, possibly extinct) and *K. susu* Cheek (endemic to Littoral, Guinea). However, the fruits of *K. magassoubiana* differ from these in that the two carpels are more deeply separated (didymous), so that the fruit is notched at both base and apex and the accrescent disc is V-shaped, since from the central style base, the two flanks spread up towards the apex of the two lobes. In *K. abouabou* and *K. susu*, the two carpels are not separated from each other at the base, and the accrescent disc is not V-shaped, but spreads in a single plane. The only known photos of fruits are of *Bidault* 2434 on Tropicos (see <https://www.tropicos.org/image/100531510>, accessed 5 Sept. 2024).

Keetia magassoubiana can be separated from *K. multiflora* with which it has been confused in FWTa (Hepper & Keay 1963) and from *K. tenuiflora* to which it appears most closely similar (Bridson 1986) using the characters in Table 1.

Bridson annotated many of the specimens at K that are cited here as “sp. nov. aff. *tenuiflora*”.

About 75% of new plant species to science published today are already threatened (Brown *et al.* 2023). Usually this is because they have small ranges making them at risk of extinction from habitat clearance (Cheek *et al.* 2020b). *Keetia magassoubiana* is unusual in having a wide range, yet it is still massively threatened due to the extent of clearance of its habitat. Conservation actions are needed if it is not to become globally extinct, as have so many other plant species (Humphreys *et al.* 2019; Cheek *et al.* 2018b).

Key to species of *Keetia* in Upper Guinea (Africa West of the Dahomey Gap)

The species in this key are: *K. abouabou*; *K. bridsoniae*; *K. cornelia* (Cham. & Schltdl.) Bridson; *K. futa* Cheek; *K. hispida* (Benth.) Bridson; *K. leucantha* (K.Krause) Bridson; *K. magassoubiana* *K. mannii* (Hiern) Bridson; *K. multiflora* (Thonn.) Bridson; *K. obovata*; *K. rubens* (Hiern) Bridson; *K. rufivillosa* (Robyns ex Hutch. & Dalziel) Bridson; *K. susu*; *K. tenuiflora*; *K. venosa* (Oliv.) Bridson and *K. venosissima* (Hutch. & Dalziel) Bridson.

Ranges within W Africa are indicated.

1. Stems with long, > 1.5 mm, erect, red or black hairs on the internode below the apex; leaf bases cordate on principal axis 14
1. Stems glabrous or, if hairs present, adpressed and / or < 0.5 mm long, white, yellow or red; leaf bases of principal axis rounded to cuneate 2
2. Tertiary nerves strongly scalariform, conspicuous, closely spread 3
2. Tertiary nerves inconspicuous or, if conspicuous, not scalariform but reticulate 4
3. Leaves small, < 3 cm wide; stems densely red hairy; throughout area **K. bridsoniae**
3. Leaves large, > 3 cm wide; stems glabrescent; throughout area **K. venosa**
4. Leaf-blades obovate, apices truncate; Liberia & Ivory Coast **K. obovata**
4. Leaf-blades ovate-elliptic or elliptic oblong, apices rounded, acute, obtuse or acuminate 5
5. Stems glabrous (first internode below apex) 9
5. Stems with hairs (first internode below apex); hairs < 0.5 mm long, sometimes sparse, either adpressed and / or erect and then usually dense 6
6. Tertiary nerves inconspicuous; stems with hairs sparse (sometimes absent), red, thick, c. 0.5 mm long, adpressed (first internode below apex); domatia glabrous, dome-like; Guinea to Ivory Coast **K. magassoubiana sp. nov.**
6. Tertiary nerves conspicuous (except *K. tenuiflora*); stems with hairs yellow, red or white, erect, < 0.5 mm long, usually dense; domatia hairy, flat and open 7
7. Leaves drying black; tertiary nerves not conspicuous; stem hairs dense, yellow. Sierra Leone & Ivory Coast **K. tenuiflora**
7. Leaves drying grey-green or dull red, tertiary nerves conspicuous; stem hairs white or red. area 8
8. Stem hairs white; quaternary nerves inconspicuous, reticulum absent; leaf-blade < 6 cm long, usually densely hairy on lower surface; throughout area **K. cornelia**
8. Stem hairs red; quaternary nerves forming conspicuous reticulum with tertiary nerves; leaf-blade 6 – 12 cm long, glabrous or sparingly hairy on lower surface; Ivory Coast & Ghana **K. venosissima**
9. Stems and leaves drying red-brown; tertiary and quaternary nerves conspicuous; stipules ovate-elliptic, c. 11 × 8 mm; throughout area **K. rubens**
9. Stems and leaves drying black or green; quaternary nerves inconspicuous; stipules with a long and slender apex, more than twice as long as broad 10
10. Fruit (fully-formed) ripening yellow-orange, 9 – 11 mm wide; disc not accrescent, < 2 mm diam.; domatia with erect tufts of hairs or pit-like, glabrous 11
10. Fruit (fully-formed) ripening green or black, 14 – 25 mm wide; disc massively accrescent, > 4 mm diam.; domatia broad, flat, with horizontal red hairs or domed with apical minute aperture and glabrous 12
11. Domatia with erect tufts of hairs, flat; stipule apex keel-like, laterally flattened; tertiary nerves often inconspicuous; midrib orange; throughout area **K. mannii**
11. Domatia pit-like, glabrous; stipule apex rounded in cross-section; tertiary nerves always conspicuous; midrib concolorous, green; throughout area **K. multiflora**
12. Fruit ripening black, 12 – 20 mm wide; domatia broad, flat, with horizontal red hairs 13
12. Fruit ripening green, 20 – 25 mm wide; domatia domed with apical, minute aperture and glabrous; Guinea to Ivory Coast **K. magassoubiana sp. nov.**
13. Leaves drying black; pedicels glabrous in young fruits, spur branches (brachyblasts) erect; fruit base rounded; Ivory Coast **K. abouabou**
13. Leaves drying green; pedicels hairy in young fruits; spur branches (brachyblasts) reflexed; fruit base cordate; Guinea **K. susu**
14. Stem principal axis inflated at intervals, hollow, inhabited by ants; stem and leaves drying black; throughout ... **K. hispida**
14. Stem principal axis lacking swellings, solid in section, not inhabited by ants; stems and leaves drying grey-green, or red-brown 15

15. Leaves and stems drying red-brown; leaves < 3 cm wide; throughout area **K. leucantha**
 15. Leaves and stems drying grey-green, not red; leaves > 3.5 cm wide 16
 16. Stems densely hairy; hypanthium with dense ruff of white hairs; stipule arista longer than wider basal part; Sierra Leone to Ivory Coast **K. rufivillosa**
 16. Stems very sparsely red hairy; hypanthium glabrous; stipule ovate-oblong, arista absent; Guinea **K. futa**

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Declarations

Conflict of Interest The authors declare that they have no conflicts of interest.

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