



Citation: Svahnström V.J., Cheek M. (2025). A taxonomic synopsis of *Heterotis* (Melastomataceae), including *H. kupensis* sp. nov., a threatened species endemic to Mt Kupe, Cameroon. *Webbia. Journal of Plant Taxonomy and Geography* 80(2) Suppl.: 121-137. doi: 10.36253/jopt-19149

Received: August 30, 2025

Accepted: September 28, 2025

Published: November 17, 2025

© 2025 Author(s). This is an open access, peer-reviewed article published by Firenze University Press (<https://www.fupress.com>) and distributed, except where otherwise noted, under the terms of the CC BY 4.0 License for content and CC0 1.0 Universal for metadata.

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Editor: Iain Darbyshire

ORCID

VJS: 0000-0001-8519-8295

MC: 0000-0003-4343-3124

A taxonomic synopsis of *Heterotis* (Melastomataceae), including *H. kupensis* sp. nov., a threatened species endemic to Mt Kupe, Cameroon

VIDA J. SVAHNSTRÖM^{1,2,3,*}, MARTIN CHEEK¹

¹ Herbarium, Royal Botanic Gardens, Kew, Richmond TW9 3AE, Surrey, UK

² Science and Solutions for a Changing Planet DTP, Grantham Institute, Imperial College London, London, UK

³ Department of Life Sciences, Imperial College London, Ascot, Berkshire, UK

*Corresponding author. Email: v.svahnstrom@kew.org

Abstract. We provide a synopsis of the African genus *Heterotis* (Melastomataceae), recognising seven species and including the description of a species new to science *Heterotis kupensis* Sv. & Cheek (Melastomataceae) known only from Mt Kupe in the South West Region of Cameroon. It differs from all other members of the genus by its tardily caducous, oblong calyx lobes; hastate pedoconnectives on the antesealous stamens with transversely ellipsoid ventral appendages; the hypanthium covered by hairs with thickened bases as well as filiform appendages on the upper half only; sessile leaf-blades and the yellow centre to the flower. In addition, we select lectotypes for *H. prostrata* (Thonn.) Benth. and *H. fruticosa* (Brenan) Ver.-Lib. & G.Kadereit, a second step lectotype for *H. buettneriana* (Cogn.) Jacq.-Fél. and designate the new name *H. welwitschii* (Cogn.) Sv. & Cheek to replace the illegitimate *H. cogniauxiana* (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit. Morphological species delimitation between *H. decumbens*, *H. prostrata*, and *H. rotundifolia* is difficult and intermediate specimens are common. *Heterotis rotundifolia* is widely reported as naturalised and invasive, however many occurrences from outside of mainland Africa actually represent *H. prostrata* or have intermediate morphology. *Heterotis decumbens* has been introduced and naturalised in Madagascar and the Mascarene Islands. Distribution, habitat, phenology, taxonomic notes, and preliminary conservation assessments following IUCN Red List criteria are presented along with a key to the species.

Keywords: aliens, conservation, endemic, *Heterotis*, invasives, Melastomataceae.

INTRODUCTION

Melastomateae are a morphologically diverse and species-rich pantropical tribe of Melastomataceae characterised by cochleate seeds with tubercles, a crown of bristles on the apex of the ovary and staminal pedoconnectives with bifurcated ventral appendages (Veranso-Libalah et al. 2022). The Melastomateae are the most species-rich melastome tribe in Africa, consisting of

24 genera and about 143 species (Veranso-Libalah et al. 2020; Chen et al. 2025). Delimitation of genera in African Melastomateae has historically been challenging due to extensive diversity and variation in a multitude of morphological characters, exacerbated by the apparent prevalence of evolutionarily labile traits within the tribe e.g. stamen isomorphy vs dimorphy. The genus *Heterotis* Benth. was first recognised by Bentham (1849) who proposed four sections *Heterotis* Benth., *Cyclostemma* Benth., *Leiocalyx* Benth., and *Wedeliopsis* Benth. In his treatment, Bentham (1849) defined *Heterotis* on the basis of its persistent, lacinate calyces with setose appendages on the hypanthium, dimorphic anthers, and loculicidal capsules. Triana (1872) transferred all of the species in sections *Leiocalyx* and *Wedeliopsis* to *Tristemma* Juss., and sections *Heterotis* and *Cyclostemma* were subsumed into a broadly defined *Dissotis* as sect. *Heterotis*, elevated to subg. *Heterotis* (Benth.) A.Fern. & R.Fern by Fernandes and Fernandes (1969). Jacques-Félix (1981) resurrected *Heterotis* at the rank of genus, recognising that staminal dimorphism, the defining character of Triana's (1872) concept of *Dissotis*, is an unreliable trait for generic classification. He defined three sections within *Heterotis*: sect. *Heterotis*, sect. *Argyrella* (Naudin) Jacq.-Fél. and sect. *Cyclostemma*.

Recently, the African Melastomateae have undergone revision in light of phylogenetic study, resulting in an updated classification of 24 monophyletic genera each diagnosed by combinations of morphological characters and supported by generic keys (Veranso-Libalah et al. 2017; Veranso-Libalah et al. 2020; Chen et al. 2025). Many accepted genera including *Heterotis* were found to be polyphyletic as previously circumscribed. Traits which have previously been used to define genera in this tribe such as flower merosity, habit, and isomorphic vs. dimorphic stamens are now, in a phylogenetic framework, recognised to have been gained and lost many times. As a result, *Heterotis* was recircumscribed, resulting in a more narrowly defined, monophyletic genus, consisting only of section *Heterotis* sensu Jacques-Félix (1981).

Veranso-Libalah et al. (2017) distinguished *Heterotis* morphologically from other African Melastomateae on the basis of the following combination of characters: decumbent herbs, leaves orbicular to ovate-lanceolate, hypanthium with stalked emergences, flowers large, 5-merous, calyx-lobes persistent, apex of intersepalal appendages with stellate emergences, and seeds cochleate and visibly arillate. Six species were recognised in the genus *Heterotis*, three of which are restricted to the Guinean-Congolian region (*H. fruticosa* (Brenan) Ver.-Lib. & G.Kadereit, *H. cogniauxiana* (A.Fern. & R.Fern.) Ver.-Lib. & G.Kadereit *nom. illegit.*, and *H. buettneriana* (Cogn.) Jacq.-Fél.), whereas the remaining three are more widely distributed in tropical Africa (*H. decumbens* (P.Beauv.) Jacq.-Fél., *H. prostrata* (Thonn.) Benth., and *H. rotundifolia* (Sm.) Jacq.-Fél.). Within species of the genus, several characters exhibit extensive variation, including some that were previously used for species delimitation, such as hypanthium indumentum, leaf shape, and habit. As a result, there has been confusion in distinguishing between species. Previous treatments have considered *H. prostrata* as a synonym (Wickens 1975) or variety of *H. rotundifolia* (Jacques-Félix 1971) and *H. rotundifolia* as indistinguishable from *H. decumbens* (Gilbert 1995). *Heterotis fruticosa* was originally described as a variety of *H. rotundifolia* before being elevated to species rank (Brenan 1950; Keay 1953). In the most recent species-level treatment of the genus, Jacques-Félix (1981; 1995) recognised six species but suggested that they are closely related, and that the widespread and particularly problematic and variable *H. rotundifolia*, *H. prostrata* and *H. decumbens* could represent a species complex.

Until now, no new species had been added to *Heterotis* s.s. since the description of *H. fruticosa* (as *Dissotis rotundifolia* var. *fruticosa*) (Brenan 1950). During fieldwork in 1995 on Mt Kupe in Cameroon, a distinctive species of Melastomateae was collected from grassland at the summit. It was first recognised as a provisionally new taxon (*Dissotis* sp. 1) in a checklist for Mt Kupe (Cheek et al. 2004). The generic keys and descriptions in Veranso-Libalah et al. (2017; 2020) support this species' placement in the genus *Heterotis* based on the presence of stalked stellate emergences on the hypanthium, intersepalal appendages with stellate hairs at the apex, cymose inflorescences, and large, 5-merous flowers.

Here, we provide a taxonomic synopsis of the seven species presently recognised in the genus *Heterotis* (Figure 1), including description of a previously unnamed species from Cameroon. We also designate a new name to replace the illegitimate *H. cogniauxiana*, lectotypes for *H. prostrata* and *H. fruticosa*, and a second step lectotype for *H. buettneriana*. We further present preliminary conservation assessments and a key to all the species in the genus.

MATERIALS AND METHODS

This study is predominantly based on herbarium specimens held at K, and in some cases images from other herbaria including BM, BR, C, COI, FHI, G, G-DC, LINN, LISU, MO, NY, P, US, and WAG. The description of the new species is based on seven duplicates of the type, which comprise all of the known material for this taxon at present. Material of the new species was



Figure 1. Representatives of the genus *Heterotis*. **A.** *H. prostrata* hypanthium and calyx; **B-C.** *H. rotundifolia* flower (B) and plant (C); **D-F.** *H. decumbens* flower (D), calyx (E) and hypanthium (F); **G.** *H. fruticosa*. Photos: A. Carel Jongkind; B. Vida J. Svahnström; C. James Bailey; D-F. Ehoarn Bidault; G. RBG, Kew.

compared morphologically with material of all other species of *Heterotis* held at K. All of the specimens seen by the authors are indicated with an exclamation mark (!) whereas specimens for which we examined images are marked “image”. Images (e.g. via gbif.org) were usually of insufficient resolution to enable or confirm identifications. There was insufficient time during the project (2024 to 2025) for the principal author (VS) to obtain material on loan to K for this study and no funds available for her for herbarium visits in relation to this work. Herbarium

material was examined using a Leica M165C dissecting binocular microscope. The drawing was made using a Leica Wild M8 dissecting binocular microscope fitted with an eyepiece graticule measuring in units of 0.025 mm at maximum magnification with a Leica 308700 camera lucida attachment. Type specimens are not given for all homotypic names in synonymy. The conservation assessment follows the categories and criteria of the International Union for the Conservation of Nature (IUCN 2012) and the guidelines for their use (IUCN 2024).

TAXONOMIC TREATMENT

Heterotis Benth., Niger Fl.: 347. 1849.

Type species: *Heterotis rotundifolia* (Sm.) Jacq.-Fél., *Adansonia*, n.s., 20: 417. 1981.

Note. Two species in the present circumscription of *Heterotis* Benth. were included in the protologue of the genus: *Heterotis prostrata* (Thonn.) Benth. and *H. rotundifolia* (Sm.) Jacq.-Fél. as *Osbeckia rotundifolia* Sm., which was treated as a synonym of *H. plumosa* Benth. Fernandes and Fernandes (1969) designated *Dissotis rotundifolia* (Sm.) Triana as the type species of *Dissotis* sect. *Heterotis*, prior to its resurrection as the genus *Heterotis*. The type species of *Heterotis* is therefore *H. rotundifolia*: Index Nominum Genericorum (Farr et al. 1996) appears to have overlooked the work of Fernandes and Fernandes (1969) in error, listing the type of *Heterotis* as non designatus.

Key to the species

1. Stems erect, not rooting at the nodes; subshrubs..... 2
1. Stems prostrate, rooting along their length; decumbent herbs 4
2. Calyx-lobes tardily caducous, oblong; antesealous stamens with pedoconnectives hastate, ventral appendages transversely ellipsoid. Cameroon..... **1. *H. kupensis***
2. Calyx-lobes persistent, linear-ovate; antesealous stamens with pedoconnectives linear, ventral appendages bilobed. 3
3. Leaves elliptic-oblong, to 3 cm wide; length: breadth 2:1, sepals persisting in fruit, flat. W. Angola ... **2. *H. welwitschii***
3. Leaves narrowly lanceolate-elliptic, to 1.5 cm wide; length: breadth 3:1, sepals rapidly shrivelling in fruit, W. Nigeria.. **3. *H. fruticosa***
4. Stamens isomorphic; apex of calyx-lobes with excurrent emergence bearing a cluster of stellate hairs **4. *H. buettneriana***
4. Stamens dimorphic; apex of calyx-lobes with or without excurrent emergence..... 5
5. Hypanthium with simple hairs or unisetulous bristles only, without stalked, stellate emergences **5. *H. decumbens***
5. Hypanthium with stalked, stellate emergences..... 6
6. Apex of calyx-lobes with excurrent emergence bearing a cluster of stellate hairs **6. *H. prostrata***
6. Apex of calyx-lobes with cluster of stellate hairs, not excurrent **7. *H. rotundifolia***

1. *Heterotis kupensis* Sv. & Cheek, sp. nov.

Type: Cameroon, S.W. Province, NE side of Mt Kupe, Peak No. 2, 1900 m elev., fl. 11 Jan. 1995, *Sidwell K.* 428 with Cheek, Gosline, Okah, Etuge, Oyugi (holotype K; isotypes BR, CAS, K, SCA, YA). (Figures 2, 3, 4).

Dissotis sp. 1 Cheek & Woodgyer in Cheek et al. (2004: 335 & plate 9F).

Diagnosis

Heterotis kupensis differs from all other members of the genus by its tardily caducous, oblong calyx lobes and hastate pedoconnectives on the antesealous stamens with transversely ellipsoid ventral appendages. All other species of *Heterotis* have antesealous stamens lacking a hastate base and having bilobed ventral appendages. Additionally, the new species is unique in that the hypanthium is covered by hairs with thickened bases as well as filiform appendages on the upper half only, whereas the hypanthium is uniformly covered with filiform appendages in all other species, except for *H. decumbens* which has only simple hairs on the hypanthium. The leaves of *H. kupensis* appear subsessile with short (< 3.5 mm) petioles, whereas most specimens of the remaining six species of *Heterotis* are distinctly petiolate. *Heterotis kupensis* is also the only species in the genus which has a corolla with a yellow centre; the other species have a uniformly pink (occasionally white) corolla.

Description

Erect herb 55–75 cm tall, with multiple stems from the base, stems ascending, woody at the base, unbranched their entire length, or sparingly and shortly branched in the distal half, sometimes rooting at nodes, stems with internodes 3.2–6.5 cm long, becoming shorter distally, covered with spreading hairs (1.0–)1.5–4.5(–5.5) mm long, scattered on internodes and in a dense ring at nodes. *Leaves* simple, opposite, elliptic or elliptic-ovate, drying brown, leaves (0.8–)2.4–3.6 x (0.5–)1.2–1.9 cm, decreasing in size up the stem, each leaf with apex acute, base rounded, margins entire to minutely crenulate with appressed bristle bases along entire length, bristles 1.5–3.0 mm; midnerve and two pairs of lateral nerves impressed on adaxial surface of lamina, prominent on abaxial surface, lateral nerves diverging from the midnerve at the base of the blade, curvilinear, outer pair of lateral nerves terminating at leaf margin 3/4 of the length of the lamina, inner pair of lateral nerves meeting or nearly meeting the midnerve at the leaf apex, transverse veins only faintly visible, forming weak arches. Adaxial surface of lamina covered (20% cover) with sim-

ple antrorse strigose hairs, more or less sigmoid, 1.0–4.5 mm with a swollen botuliform base appressed ca. 0.5 mm long, the distal part fine, bristlelike, hairs becoming shorter towards the apex of lamina, abaxial surface (10% cover) with simple antrorse, slightly appressed hairs, with less pronounced swollen bases than hairs on adaxial surface, 1.0–3.8 mm long, hairs sparse on abaxial lamina surface, denser on the principal veins; petiole terete 2.0–3.5 mm long, hairs as lamina. *Inflorescence* terminal, cymose, (1–)4–5(–6) flowered, or with 1–2 flowers in upper axils, flowers 5-merous, pedicels 2–4 mm long. *Bracts* caducous, falling at anthesis, two pairs per flower, the outer pair 3.0–4.5 x 2.0 mm drying tan, ovate, glabrous except for ciliate margins with cilia 1.0–3.5 mm long, inserted 1.5–2.0 mm above the most distal leaf node, inner pair inserted 2.0 mm above the outer pair and 1.0 mm below the flower, drying purple, ovate, 2.0–2.7 x 1.5–2.5 mm, glabrous except for ciliate margins with cilia 0.8–1.3 mm long. *Hypanthium* campanulate 5.0–9.5 x 4.3–6.0 mm, densely covered with persistent white hairs 2.5–3.5 mm long with swollen bases, penicillate appendages on the upper ½ of hypanthium 0.3–0.9 x 0.2–0.4 mm with a tuft of 1–4 white hairs, upper ½ of hypanthium also with purple, filiform appendages 1.2–2.0 x 0.2–0.3 mm, stellate with many white hairs at apex; intersepal appendages similar in form and colour to the filiform hypanthial appendages but caducous, larger, 2.0–2.9 x 0.2–0.4(–0.8) mm. *Calyx* green drying purple, sepals oblong, 5.0–7.5 x 2.5–3.5 mm, tardily caducous, falling after anthesis, margins ciliate with cilia (0.1–)0.5–1.0(–2.0) mm long, glabrous on the inside, with very few short hairs near base on the outside 0.4–1.4 mm long, and a thickened stellate cluster of many white hairs each 1.0–4.0 mm long at the apex. *Corolla* pale pink, centre yellow with a dark pink edge, petals five, obovate, 2.0–2.5 x 2.0–2.5 cm, glabrous except for ciliate margins with cilia 0.2–0.5(–1.5) mm long. *Stamens* ten, yellow with pink anthers opening by an introrse pore, dimorphic, antesealous stamens five, filament 3.0–4.0 x 0.5–1.0 mm, pedoconnective hastate, 3.5–4.5 mm long, 1.0–1.5 mm wide at base, tapering at the apex, the proximal arms approximately triangular, diverging from the truncate base of the connective and each other by c. 180°, ventral appendage pair swellings transversely ellipsoid, 0.5–0.7 mm collateral at the connective base, anther falcate, 4.5–5.0 x 0.5–1.0 mm, antepetalous stamens five, filaments 2.5–3.5 x 0.5–1.0 mm, pedoconnective not developed, ventral appendages spreading, each ovoid 0.2–0.3 mm long, diverging from each other by 90°, anther 2.5–3.0 x 0.5–1.0 mm, erect. *Ovary* ellipsoid ca. 2.0 x 1.5 mm, sparsely covered in white hairs 0.5–1.0 mm long, with a ring of five appendages at apex sur-

rounding the style, persistent in fruit, appendages comprised of 5–7 erect bifurcating bristles each 1.0–1.5 mm long. *Style* ca. 15 mm long, glabrous, curved, stigma truncate. *Fruit* not seen.

Etymology

The species is named for Cameroon's Mt Kupe where it appears to be endemic. Other species endemic to and named for Mt Kupe include *Memecylon kupeanum* R.D. Stone *et al.* (Melastomataceae, Stone *et al.* 2008), *Afrothismia kupensis* Cheek (Afrothismiaceae, Cheek *et al.* 2019; 2024) and *Kupeantha kupensis* Cheek & Sonké (Rubiaceae, Cheek *et al.* 2018).

Phenology

Collected in flower in January.

Distribution and habitat

CAMEROON: South West Region, known only from the type collection made at the summit of Mount Kupe (Fig. 4). Montane grassland with *Adenocarpus mannii* and *Pentas* sp., elevation c. 1900 m.

Conservation status

This species is known only from montane grassland at the summit of one of the peaks of Mt Kupe. The area of grassland at the peak is less than 1 km², and as such the extent of occurrence (EOO) and area of occupancy (AOO) are both calculated as 4 km² (using 2 km x 2 km grid cells, see IUCN guidelines), well below the thresholds for threatened categories under subcriteria B1 and B2. There are several other peaks on Mt Kupe with grassland areas at the summit; these have been explored by botanists and this species has not been found at any other localities. However, steep, inaccessible areas on these peaks have not been thoroughly surveyed (Cheek *et al.* 2004) and this species may occur on one or more peaks hitherto undetected. Even if this species occurs on these peaks, or in other areas of montane grassland adjacent to Mt Kupe, it is highly likely that the true AOO falls below the threshold for a threatened category, considering the small area of these summit grasslands. Moreover, extensive surveys in other upland areas of the Cameroon Highlands have been carried out but this species has so far been found in none of these (Cheek *et al.* 1996; Cable and Cheek 1998; Cheek *et al.* 2000; Maisels *et al.* 2000; Chapman and Chapman 2001; Cheek *et al.* 2004; Harvey *et al.* 2004; Cheek *et al.* 2006; Cheek *et al.* 2010; Harvey *et al.* 2010; Cheek *et al.* 2011). While the population size has not been assessed, and although this species was reported as common at its only known site,



Figure 2. *Heterotis kupensis*. A. habit (open flower from photo); B. leaf, adaxial surface; C. leaf, abaxial surface; D. hair, from leaf lamina, proximal part, adaxial surface; E. hair, from leaf midrib, abaxial surface; F. hair, from leaf lamina, abaxial surface; G. margin of leaf with 2 hair types, abaxial surface; H. stem indumentum; I. hypanthial ornamentation (flower bud); J. hypanthium (hairs omitted) part opened to show ovary apex and stamens, all but one petal removed; K. antepetalous (short) stamen, ventral face; L. as K, dorsal face; M. antesepalous (large) stamen, ventral face; N. as M, dorsal face; O. detail of M (pore at anther apex). A-O. all from Sidwell 428. Drawn by Andrew Brown.



Figure 3. Flower of *Heterotis kupensis* (Sidwell 428) Photo: Martin Cheek.

it is likely that less than 1,000 individuals occur there given the extremely small area of potentially suitable habitat. There are no known threats to this species at its type locality, and human encroachment does not currently extend beyond ca. 1,100 m elevation on Mt Kupe apart from on the eastern slopes. There is a potential future threat of fire, however no evidence of human-set fires has been detected on any of the peaks at Mt Kupe (Cheek et al. 2004). Given the likelihood that this species has an extremely small population size of less than 1,000 individuals, it is preliminarily assessed as Vulnerable D1.

Notes

Each of the three peaks of Mt Kupe have small areas of montane grassland with similar plant assemblages (Cheek et al. 2004), yet *H. kupensis* has only been collected from one of these, where it was recorded as being locally common. These areas of montane grassland are considered to be inselberg caps of their respective peaks (Cheek et al. 2004). Two other species of *Heterotis* (*H. fruticosa* and *H. cogniauxiana*) occur on inselbergs in Nigera and Angola respectively. These are also the only other species in the genus which consistently exhibit an upright, woody growth habit, whereas the remaining species are typically decumbent herbs that root at the nodes. The duplicates of the type specimen are believed

to be from more than one individual in the same population by the second author, who was present at the collection. It is possible that this species might also occur in Bandoumkassa (Veranso Libalah pers. comm. to Cheek, 2025), however, until verified we consider this species to be endemic to Mt Kupe.

2. *Heterotis welwitschii* (Cogn.) Sv. & Cheek, **nom. nov.**

Bas.: *Osbeckia welwitschii* Cogn. in A.L.P.P. de Candolle & A.C.P. de Candolle, Monogr. Phan. 7: 333. 1891.

Type: Angola, Pungo Andongo, rio Cuanza, pr. de Sansamanda, *Welwitsch* 907 (holotype G-DC barcode G00319429! image; isotypes: BM barcode BM000902297! image, COI barcode COI00005417! image, K barcode K000313363!, LISU barcode LISU209417, P barcode P000412573! image).

(=) *Dissotis cogniauxiana* A.Fern. & R.Fern., Bol. Soc. Brot., sér. 2, 28 : 67. 1954 (non *Dissotis welwitschii* Cogn. (Cogniaux 1891: 371).

(≡) *Heterotis cogniauxiana* (A.Fern & R.Fern.) Ver.-Lib. & G.Kadereit, Taxon 66 : 609. 2017. **nom. illegit., synonym. nov.**

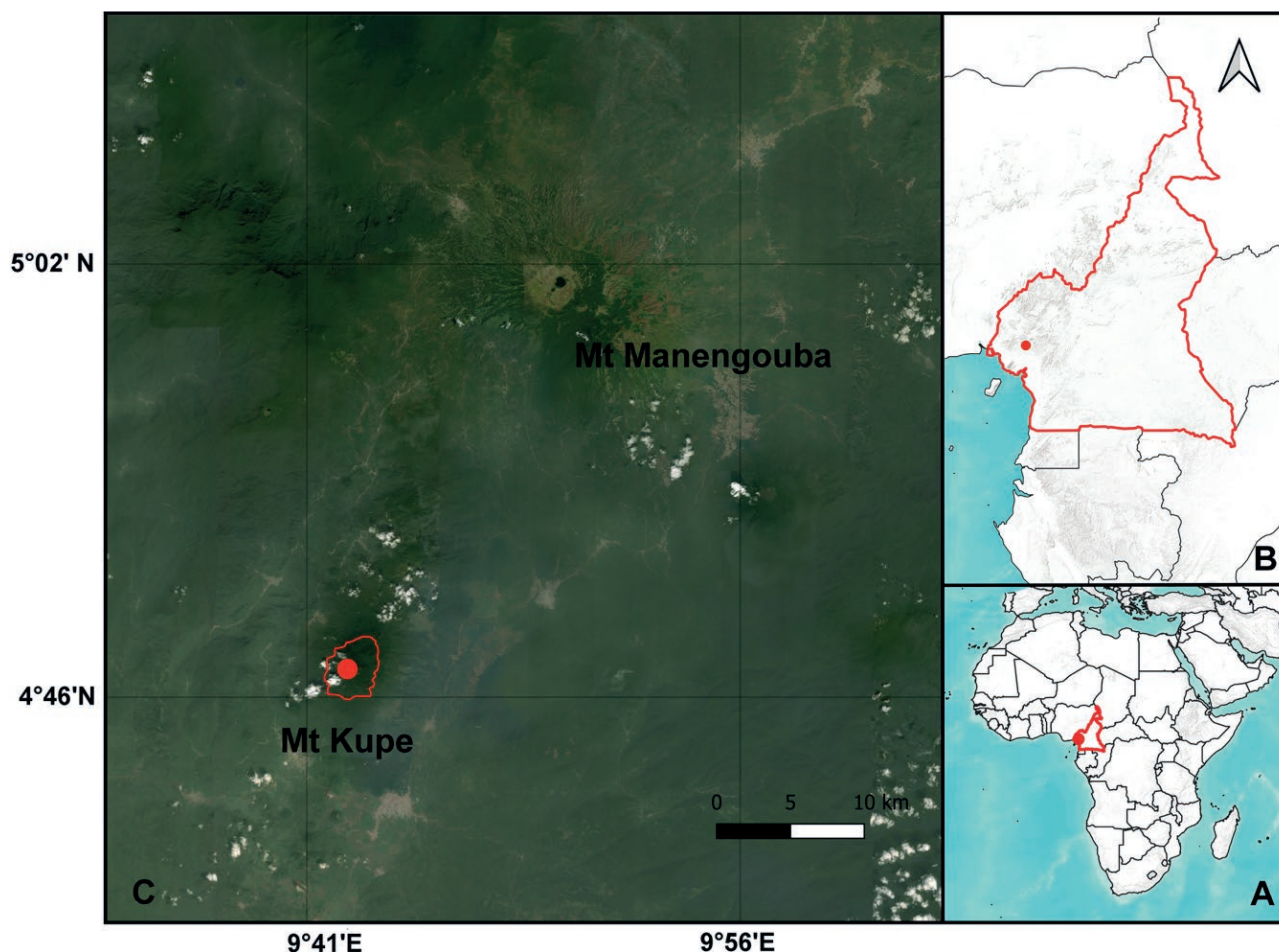


Figure 4. Global distribution map of *Heterotis kupensis*.

Etymology

Named for the Austrian botanical collector Friedrich Welwitsch (1806–1872), who collected the type material.

Phenology

Collected in flower between October–March, and in fruit January–March.

Distribution and habitat

Angola. Growing among rocks on the banks of streams in rocky deciduous woodland, 1,110–1,300 m elev.

Conservation status

Heterotis welwitschii is endemic to the Angolan highlands. Based on herbarium specimens, this species has a minimum EOO of 10,080 km², below the threshold for the Vulnerable category. *Plants of Angola* (Figueiredo and Smith 2008) lists this species from four provinces: Huila,

Namibe, Malange, and Cuanza Norte. It is only represented from a single collecting locality in each of these provinces corresponding to four widely separated locations. However, it is likely that it is more widespread than can be inferred from specimen records due to low botanical collection effort across much of its large range, which extends from the northern to southern Angolan highlands. It is likely undergoing a continuing decline in the area, extent, and suitability of habitat at three of its known localities which are near towns (e.g. Bibala) or in areas which have been extensively converted for agriculture. However, there are large areas of potentially suitable habitat within its extensive range and the most recent collection is from Mt Tchivira, where the native vegetation is intact. This species could potentially qualify as Vulnerable if it is in fact known from fewer than ten locations undergoing a continuing decline, or it may be Least Concern if found to be more widespread. Thus, given the uncertainty, this species is preliminarily assessed as Near Threatened B1b(iii).

Notes

Osbeckia welwitschii Cogn. typified by *Welwitsch* 907 was published in the same work as *Dissotis welwitschii* Cogn. [° *Eleotis welwitschii* (Cogn.) Ver.-Lib. & R.D.Stone] typified by *Welwitsch* 917 (Cogniaux 1891). Thus, when *O. welwitschii* was later transferred to *Dissotis*, Fernandes and Fernandes (1954) needed a nomen novum (*D. cogniauxiana*) since the name *D. welwitschii* was preoccupied based on a different type. Following the recent placement of *O. welwitschii* in *Heterotis* (Veranso-Libalah et al. 2017), the combination *H. cogniauxiana* (A.Fern. & R.Fern) Ver.-Lib. & G.Kadereit was made. However, under the Code (Turland et al. 2018), *H. cogniauxiana* is an illegitimate i.e. superfluous name (see Arts. 6.4 and 52.1), and the correct combination is *H. welwitschii* (see Art. 11.4, especially example 12).

Representative specimens examined.

ANGOLA. Mt. Tchivira. Lucondo Mission near NE corner of mountain, 1110 m elev., fl. 7 Oct. 2013, Goyder et al. 7373 (K!); Vila Arriaga, Mahita, fl. & fr. 25 Jan. 1962, Correia 1798 (LISC barcode LISC030602! image); Cuanza Norte, Pungo Andongo, 1150 m elev., fl. 31 March 1937, Exell & Mendonça 211 (LISC barcode LISC030603! image).

3. *Heterotis fruticosa* (Brenan) Ver.-Lib. & G.Kadereit, Taxon 66: 609. 2017.

Type: Nigeria, Ondo, about 3 km. E of Ondo, north of the Akure road, fl. 21 Sept. 1948 Keay 22569 (K barcode K000313157!; isoelectotypes K K000313153!, FHI0022569! image!). Lectotype designated here.

(≡) *Dissotis rotundifolia* var. *fruticosa* Brenan, Kew Bulletin 5: 227. 1950.

(≡) *Dissotis fruticosa* (Brenan) Brenan & Keay, Kew Bulletin 7: 547. 1953.

Etymology

Named for the shrubby growth habit which distinguishes it from co-occurring species of *Heterotis*.

Phenology

Collected in flower and fruit in October.

Distribution and habitat

Idanre Hills, Ondo province in western Nigeria.

“Shrubby vegetation among *Trilepis* (now *Afrotrilepis*) mats”. 450–950 m elev.

Conservation status

This species is only confidently known from the Idanre Hills in Ondo province, western Nigeria. This small area of granite inselbergs only covers a few square kilometres, such that the extent of occurrence is inferred to fall within the threshold for the Critically Endangered category (< 100 km²). It has only been collected from two of the inselberg ‘hills’, although it is likely that it occurs on additional, less accessible outcrops which have not been thoroughly surveyed. However, the total area of potentially suitable habitat at Idanre Hills is small; Richards (1957) observed that the *Trilepis* (now *Afrotrilepis*) mat community which *H. fruticosa* occurs in covered only about 20% of the surface of Carter’s Peak, one of the two inselbergs which it has been recorded from. Thus, the area of occupancy is likely to be <10 km². There is inferred to be a continuing decline in the area, extent, and quality of habitat for this species due to wood cutting and clearance for cultivation of cash crops such as cocoa, pepper, corn, and bananas (Onadeko et al. 2014). Given the extremely restricted range and continuing decline of habitat, this species is preliminarily assessed as Critically Endangered B1ab(iii)+B2ab(iii).

Notes

In the protologue for this species’ basionym, Brenan (1950) does not designate a holotype among the duplicates of Keay 22569, which are held at K and FHI. Keay (1953) cites ‘typus speciei in Herb. Kew.’, however, there are two sheets of Keay 22569 at K. We designate the K specimen with barcode K000313157 as the lectotype as it is the most representative, following Article 9.12 of the Code (Turland et al. 2018).

Representative specimens examined

NIGERIA. Ondo, Idanre Hills, Carter Peak, fl. 24 Oct. 1948, Keay 22583 (K barcode K002833085!); Ondo, A few yards to the U.H.F on a wet area on top of the mountain, fr. 4 Aug. 1974, Daramola et al. 71111 (K barcode K002833088!); Ondo, Idanre Hills; Carter Peak, fr. 29 Oct. 1949, Keay 25503 (K barcode K002833086!); Ondo, Idanre Hills, on east side of Orosun, fl. & fr. 30 Oct. 1949, Keay 25512 (K barcode K002833087!, FHI FHI0025512-0! image); Idanre hills, 30 km E of Ondo, about 3 km S of Idanre fl. & fr. 1 Oct. 1977 (K barcode K002833089!).

4. *Heterotis buettneriana* (Cogn.) Jacq.-Fél., *Adansonia*, n.s., 20: 418. 1981.

Bas.: *Osbeckia buettneriana* Cogn. ex Büttner, *Verh. Bot. Vereins Prov. Brandenburg* 31: 95. 1889.

Type: Lectotype (first-step lectotypification designated by Jacques-Félix (1971); second step-lectotypification designated here): Gabon, Ogôoué, *Thollon 444* (P barcode P00412569! image; isolectotypes: P00412568! image, P00412570! image). Additional syntype: Gabon, *Büttner 23* (B⁺).

Bas.: *Osbeckia buettneriana* Cogn. ex Büttner, *Verh. Bot. Vereins Prov. Brandenburg* 31: 95. 1889.

(≡) *Dissotis buettneriana* (Cogn.) Jacq.-Fél., *Adansonia*, n.s., 11: 547. 1971.

(=) *Osbeckia rubropilosa* De Wild., *Pl. Bequaert*. 1 : 378. 1922.

Type: Democratic Republic of the Congo, Avakubi, 30 Dec. 1913, *Bequaert 1678* (BR! BR0000005571147 image).

Etymology

Named for the German botanical collector Oskar Alexander Richard Büttner (1858-1927).

Phenology

Collected in flower and fruit between September–April.

Distribution and habitat

Cameroon, Equatorial Guinea, Gabon, Republic of Congo, Democratic Republic of Congo. Lowland evergreen forest and clearings. 50–800 m elev.

Conservation status

This species has a large extent of occurrence (EOO) of at least 900,000 km². It has been recorded from many more than ten locations and occurs in a range of different habitats, including disturbed sites. It is not thought that there are any major threats impacting this species. It is preliminarily assessed as Least Concern.

Notes

In the absence of flowering material with which to examine the stamens, this species may be confused with *H. prostrata* due to its distinctly excurrent emergences at the apex of the sepals, which persist in fruit.

The protologue for this species' basionym (Cogniaux in Büttner 1889) lists two collections: *Büttner 23* and *Thollon 444*. The former was presumably destroyed at Berlin during World War II. The extant gathering *Thollon 444* (P) was subsequently designated by Jacques-Félix (1971) as a lectotype, however there are three sheets for *Thollon 444* in P. We designate the *Thollon 444* sheet with barcode P00412569 as the second-step lectotype because it is the only sheet with flowers in which the characteristic isomorphic stamens are clearly visible (Art. 9.17 of Turland et al. 2018).

Representative specimens examined

CAMEROON. Central Province, Mefou Proposed National Park Ndanan 2, 03.37°N 11.34° E, 700 m, fl. & fr. 22 March 2004, *Darbyshire* et al. 185 (K barcode K000023198!, YA, P); Central Province, Mefou Proposed National Park Ndanan 2, 03.37°N 11.34° E, 700 m, fl. 15 Oct. 2002, *Cheek* et al. 11111 (K barcode K000023197!, YA, WAG, SCA). **EQUATORIAL GUINEA.** Bata-Senge: Estrada km. 38 Bibogo, 650 m, fl. & fr. 9 April 1997, *Carvalho* 6279 (NY! image, US! image, WAG! image, MA). **GABON.** Woleu-Ntem, chantier Oveng vers Mitzi, 0.40°N, 11.25° E, fl. & fr. 6 May 1986, *Louis* 2163 (K barcode K002834366!, WAG); Ogooue-Maritime, former extraction road system accessible from Peni CBG chantier, 2°02.50' S, 10°24.98' E, fl. 28 Oct. 2005, *van Valkenburg* et al. 3013 (K barcode K002834367!, WAG). Estuaire, Libreville. P1: Arboretum de Sibang, 0° 25' N 9° 29' E, 50 m, fl. & fr. 7 Dec. 1999, *Simons* et al. 291 (WAG! image, MO! image, HNG, LBV). Goumina, (Mayombe), 100-200 m, fl. 1 dec. 1990, *la Croix* 4986 (MO! image, BR! image). **DEMOCRATIC REPUBLIC OF CONGO.** Haut-Zaïre. Ituri; Zone de Mambasa; ca. 14 km SSW of Epulu and 2 km S of Tito River on trail to Ituri River, summit of Mabobo Hill, 01° 16' 23" N 28° 32' 27" E, 790 m, fl. 2 Feb. 1994, *Gereau* et al. 5273 (BR! image, MO! image, WAG! image); Ituri; Zone de Mambasa; Basakwe Camp, west bank of Basakwe River ca. 4 km ESE of confluence of Egoro and Afarama Rivers, 01°32'24"N 028°32'41"E, 790 m, fl. 10 Feb. 1994, *Gereau & Bocian* 5314 (MO! image); near Bafwasende, fl. & fr. 26 Sept. 1957, *Croockewit* 700 (WAG! image).

5. *Heterotis decumbens* (P.Beauv.) Jacq.-Fél., *Adansonia*, n.s., 20: 418.

Bas.: *Melastoma decumbens* P.Beauv., *Fl. Oware* 1 : 69. 1806.

Type: « *Palisot de Beauvois s.n.* » (G G00014591! image) lectotype designated by Jacques-Félix (1983).

(≡) *Rhexia decumbens* (P.Beauv.) Poir. in Lam., *Encycl.*, Suppl. 4 : 628. 1816.

(≡) *Osbeckia decumbens* (P.Beauv.) DC., *Prodr.* 3: 143. 1828.

(≡) *Asterostoma decumbens* (P.Beauv.) Blume, *Mus. Bot.* 1: 50. 1849.

(≡) *Dissotis decumbens* (P.Beauv.) Triana, *Trans. Linn. Soc. London* 28: 58. 1872 [1871].

(=) *Heterotis laevis* Benth., *Niger Fl.*: 348. 1849.

Type: Nun River, *Vogel* 36 (K barcode K000313165!).

(≡) *Dissotis laevis* (Benth.) Hook.f., *Fl. Trop. Afr.* 2: 451. 1871.

(=) *Dissotis mahonii* Hook.f., *Bot. Mag.* 129: t. 7896. 1903.

Type: coll. Uganda 1901, cult. Kew 8 Sept. 1902, *Mahon* 28 (K barcode K000313072!).

(=) *Dissotis decumbens* Triana *var. minor* Cogn. in A.L.P.P. de Candolle & A.C.P. de Candolle, *Monogr. Phan.* 7: 369. 1891.

Type: Democratic Republic of Congo, Bangala, fl. & fr. 8 June 1888, *Hens* 164 (K barcode 000313104!, BR BR0000006493417! image, BR0000006494384! image).

Etymology

Named for its decumbent habit.

Phenology

Collected in flower and in fruit between October–June.

Distribution and habitat

Nigeria, Cameroon, Equatorial Guinea, Gabon, Republic of Congo, Democratic Republic of Congo, Central African Republic, South Sudan, Uganda, Tanzania, Angola. Introduced to Madagascar and the Mascarene Islands. Grows in forests and forest margins or clearings, along streams, roadsides, in plantations, and disturbed areas, sometimes creeping on boulders. 0–1,200 m elev.

Conservation status

This species is widespread with a very large range. It occurs at many more than ten locations and is sus-

pected to have a large population size. It is not thought that there any major threats impacting this species. It is therefore preliminarily assessed as Least Concern.

Notes

Jacques-Felix (1983a; 1983b) effectively lectotypified *H. decumbens* (P.Beauv.) Jacq.-Fél by citing “Palisot de Beauvois, Nigeria (G!)” as the type. The stalked, stellate hypanthial emergences which otherwise characterise the genus *Heterotis* are reduced to setae or simple hairs in this species. In some specimens, the hypanthium is glabrescent. Whereas *H. prostrata* and *H. rotundifolia* appear to be widely naturalised across the tropics, this species is only known to be naturalised in Madagascar and the Mascarene Islands. All of the specimens of *Heterotis* from Madagascar and the Mascarene Islands examined in the preparation of this synopsis belonged to *H. decumbens*.

Representative specimens examined.

NIGERIA. Degema, Brass, fl. 14 December 1962, *Daramola & Aderson FHI* 46329 (K barcode K002834257!). **CAMEROON.** Abong-Mbong, fl. 10 Sept. 1962, *Price & Evans* 254 (K barcode K002834403!); South Region, south of Kribi, near new Kribi deep water port site, 2°42'18.0"N 9°51'49.1"E, fl. & fr. 16 October 2017, *van der Burgt et al.* 2151 (K barcode K001286879!, WAG, YA). **EQUATORIAL GUINEA.** Fernando Poo, fl. 27 Nov. 1946, *Guinea* 258 (K barcode K002834410!). **GABON.** Estuaire, between Cap Santa Clara and Cap Esterias, 0°32.86' N, 9°18.51' E, 2 m elev., fr. 23 Feb. 2003, *Wieringa* 4812 (K barcode K002834405!, WAG); Ogooue-Maritime, old logging road leading southward from chantier CBG Peni, 2°07.80' S, 10°25.10' E, 225 m elev., fl. 22 April 2005, *van Valkenburg et al.* 3156 (K barcode K002834406!, WAG); Nyanga, Bame, fishing camp, 60 km S of Mayomba, 27 km N of Congo Brazzaville border, 03°47' 07" S, 11°01' 01" E, fl. 11 May 2001, *Walters et al.* 640 (K barcode K002834407!, MO). **REPUBLIC OF CONGO.** Kouilou, Tchimpounga, Zone soleil 1, 4° 30' 53.7" S, 11° 46' 04.8" E, 5 m elev., fl. 5 Dec. 2012, *Mpandzou et al.* 1709 (K barcode K001393346!); Kouilov, Point 4, Noumbi, bloc Paris, 4° 5' 58.0" S, 11° 20' 11.0" E, 2 m elev., fl. & fr. 15 April 2013, *Nkondi et al.* 652 (K barcode K001393328!). **DEMOCRATIC REPUBLIC OF CONGO.** Boma, fr. 10 Oct. 1931, *Dacremont* 68 (K barcode K002834408!, BR, WAG); Jardin D'Eala, fr. 22 May 1946, *Leonard* 166 (K barcode K002834424!, BR). **CENTRAL AFRICAN REPUBLIC.** Ndakan, gorilla study area Njéké from M5400 to C 5800, 02°21'N 016°12'E, 350 m elev. fl. 7 May 1988, Harris & Fay 603 (MO! image). **SOUTH SUDAN.** Talanga, 4°01' N, 32° 45' E,

950 m elev., fr. 2 Dec. 1980, *Friis & Vollesen* 638 (K barcode K002834472!), Khor Atiziri, fl. & fr. 28 Feb. 1870, *Schweinfurth* 3093 (K barcode K002834473!). **UGANDA.** Entebe, 3900 ft elev., fl. 1901, *Fin. Michon s.n.* (K barcode K002834555!). **TANZANIA.** East shore, fr. Oct. 1893–1894, *Scott-Elliot* 8232 (K barcode K002834558!) **ANGOLA.** fl. 1910 *Gossweiler* 4705 (K barcode K002834745!); near Loango River, fl. Oct. 1921, *Dawe* 274 (K barcode K002834743!). **MASCARENE ISLANDS (INTRODUCED).** **REUNION.** Bord de zoute Le Tremblet, fl. 20 Nov. 1970, *Friedmann* 629 (K barcode K002834785!); **MADAGASCAR (INTRODUCED):** Antsiranana, Fivondronana d'Antalaha, Canton d'Ambohitralanana, à Andrahimbazaha, 15° 17' S, 50° 27' E, 0–60 m elev., fr. 29 April 1994, *Rahajaso* 367 (K barcode K002834784!); Toamasina, Soanierana Ivongo, Antanambao-Andran-gazaha, 16° 51'12" S, 49° 41'37" E, 0 m. elev., fr. 27 Nov. 2016, *Rakotoarisoa & Andriamahay* SNGF 3840 (K barcode K000936861!, TAN, SNGF, TEF);

6. *Heterotis prostrata* (Thonn.) Benth. in Hooker Niger Fl.: 349. 1849.

Bas.: *Melastoma prostratum* Thonn. in Schumacher, Beskr. Pl.: 220. 1827.

Type: Ghana *Thonning* 285 (C barcode C10004150! image) **lectotype here designated**; isoelectotype C10004151! image).

(≡) *Dissotis prostrata* (Thonn.) Hook.f., Fl. Trop. Afr. 2: 452. 1871.

(≡) *Dissotis rotundifolia* var. *prostrata* (Thonn.) Jacq.-Fél., Adansonia, n.s., 11: 548 1971.

(=) *Dissotis deistelii* Gilg ex. Engl. in H.G.A. Engler & C.G.O. Drude, Veg. Erde 9(III 2): 748. 1921.

(=) *Dissotis schliebenii* Markgr., Notizbl. Bot. Gart. Berlin-Dahlem 12: 716. 1935.

Type: Tanzania, Muera Hochfläche, 60 km westlich Lindi, fl. 24 Feb 1935, *Schlieben* 6068 (BM isotype! image).

(=) *Lepidanthemum triplinervium* Klotzsch in W.C.H. Peters, Naturw. Reise Mossambique 6(Bot. 1): 64. 1861.

(≡) *Heterotis triplinerva* (Klotzsch) Triana, Trans. Linn. Soc. London 28: 58. 1872 [1871].

(=) *Osbeckia zanzibariensis* Naudin, Ann. Sci. Nat., Bot., sér 3, 14: 55. 1850.

Type: *Bojer s.n.* (P P00412583! image).

Etymology

Named for its prostrate habit (i.e. lying flat on the ground).

Phenology

Collected in flower and fruit year-round.

Distribution and habitat

Ghana, Guinea, Sierra Leone, Côte d'Ivoire, Nigeria, Cameroon, Equatorial Guinea, Gabon, Republic of Congo, Democratic Republic of Congo, Uganda, Tanzania, Kenya, Angola, Zambia, Malawi, Zimbabwe, Mozambique. Grows in forests and forest margins or clearings, along streams, roadsides, in plantations, and disturbed areas, sometimes creeping on boulders.

Conservation status

This species is widespread with a very large range. It occurs at many more than ten locations and is inferred to have a large population size. It is not thought that there any major threats impacting this species. It is therefore preliminarily assessed as Least Concern.

Notes

There are two sheets of *Thonning* 285 in C. We designate the sheet with barcode C10004150 as the lectotype, as it is most representative, following Article 9.12 of the Code (Turland et al. 2018).

Jacques-Félix (1971; 1983a) distinguished this species from *H. rotundifolia* based on elliptical rather than broadly ovate to suborbicular leaves, and sparser covering of emergences on the hypanthium, in addition to the character in the key presented in this synopsis: stellate emergences excurrent at the apex of the sepals (not excurrent in *H. rotundifolia*). All of these characters are variable within these two species, which have been synonymised in some past treatments (e.g. Jacques-Félix 1971). We deploy only the excurrent (*H. prostrata*) vs. non-excurrent (*H. rotundifolia*) sepal emergences in the key couplet for distinguishing these species as this appears to be the most consistent and recognisable difference between them. Yet some specimens of *H. prostrata* exhibit distinctly excurrent stellate emergences whereas in others, it is difficult to determine if the stellate cluster of hairs can be considered slightly excurrent or not. *Heterotis prostrata*, *H. decumbens*, and *H. rotundifo-*

lia may indeed comprise a species complex as suggested by Jacques-Félix (1981; 1995). Alternatively, intermediate forms could represent hybrids between *H. prostrata* and *H. rotundifolia*. Further work is necessary to clarify the species limits in this part of the genus.

Representative specimens examined

GUINEA: Kerouane, Langbalema Mt. ridge to N of Kerouane–Bamankoro road 09° 12' 48" N, 9° 9' 54" W, 745 m; fr. 29 Oct 2008; *Darbyshire* 561 (K barcode K000615189!, HNG); **SIERRA LEONE:** fl. 2 April 1951, *Deighton* 5389 (K barcode K002834267!); **COTE D'IVOIRE:** Abidjan; market of Adjamé; 3 June 1970, Koning 711 (WAG WAG.1096117! image); **NIGERIA:** Adamawa Division, Vogel Peak area, approx. 84° 25' N, 11° 50' E, 920 m elev., fl. 20 Nov 1957, *Hepper* 1414 (K barcode K 002834318!); Benue Plateau, Jos, Assob escarpment, 09° 30' N, 08° 40' E, fr. 22 April 1972, *Wit* et al. 1464B (K barcode K002834320!); South E. State, Ikom, Abu village about 16 miles from Bende/Ayuk village on Abudu road, fl. 1 March 1973, *Latilo* 67746 (K barcode K002834325!); **CAMEROON:** South West Province, Kupe-Muaneguba Division, Kupe Village Muanegum trail, 1200 m elev., fr. 28 March 1996, *Etuge* 1840 (K barcode K000197738!, YA); South West Province, Mount Cameroon, Idenau, 2 m elev., fr. 17 Oct 1995, Dawson 35 (K barcode K000050228!, SCA, YA); Littoral Region, Ebo Proposed National Park, village, 04° 24' 22.3" N, 10° 9' 56.9" E, 100 m elev., fr. 3 Dec 2019, *Alvarez* 34 (K barcode K001310318!); **EQUATORIAL GUINEA:** Bioco, Malabo-Brasile, km 11, 220 m elev., fr. 25 July 1986, *Carvalho* 2090 (K barcode K002834439!); **GABON:** About 20–40 km. NNE of Koumémayong, fr. 13 April 1988, *Breteler, Jongkind, & Dibata* 8671 (K barcode K002834427!); **REPUBLIC OF CONGO:** Léopoldville, Thysville, fr. 28 Jan 1950, *Compère* 1371 (K barcode K002834458!); **DEMOCRATIC REPUBLIC OF CONGO:** Riviere Kalamu, Makala (ville de Kinshasa), fl. 18 Nov 1976, *Breyne* 3486 (WAG barcode WAG.1092457! image); **UGANDA:** Rabongo Forest, approx. 2° 6' N, 52° E, 1020 m elev., fl. & fr. 12 May 1993, *Sheil* 1636 (K barcode K002834560!); **TANZANIA:** Magewga Estate. dist. Korogwe, fl. 15 April 1952, *Faulkner* 984 (K barcode K002834614!); Magila nr Muhesh, 600 m elev., fl. 8 Nov 1970, *Archbold* 1290 (K barcode K002834611!); Amani, fr. 21 Dec 1949, *Verdcourt* 8 (K barcode K002834610!); **KENYA:** K7, Kwale District, Gongoni For Res NE side, 30 m elev., fl. 2 June 1990, *Robertson & Luke* 6346 (K barcode K002834559!); K7 Kwale District, Shimba Hills, fr. 1 April 1968 *Magogo & Glover* 609 (K barcode K002834582); K7 Kilifi District, just north of Mariakani, fl. & fr. 8 March 1977, *Hooper & Townsend* 1256 (K bar-

code K002834580!); **ANGOLA:** Malange, s.d., *Gossweiler* 1275 (K barcode K002834782!); **ZAMBIA:** Mwinilunga District. Road to Congo border., 1290 m elev., fl. 14 Nov 1962, *Richards* 17208 (K barcode K002834764!); Rapids Mwinilunga, fr. 20 May 1969, *Mutimushi* 3229 (K barcode K002834766!); **MALAWI:** Northern Region, Nkhata Bay District. 5 km W of Nkhata Bay, by road in Kandoli Forest Reserve, 550 m elev., fl. 6 March 1982, *Brummitt* et al. 16343 (K barcode K002834761!); fl. & fr. 2 Feb 1955, *Jackson* 1440 (K barcode K002834758!); **ZIMBABWE:** District Melssetter; Haroni River, 457 m elev., fl. 24 April 1962, *Wild* 5733 (K barcode K002834769!); **MOZAMBIQUE:** Moramballa, fr. 30 Dec 1858, *Kirk s.n.* (K barcode K002834752!); Niassa, Cabo Delgado, Palma, andados 14 km de Palma para Nangade, 50 m elev., fl. 18 April 164, *Torre & Paiva* 12132 (K barcode K002834747!); Manica, Chimanimani foothills, Maronga, Chiira River, west of Comeni's compound, 19° 58' 33" S, 33° 05' 14" E, 342 m elev., fl. 14 Nov 2015, *Darbyshire* 906 (K barcode K001187553!).

7. *Heterotis rotundifolia* (Sm.) Jacq.-Fél., Adansonia, n.s., 20: 417.1981.

Bas.: *Osbeckia rotundifolia* Sm., Cycl. [A. Rees], London. 1819.

Type: Sierra Leone *Afzelius s.n.* (BM BM000902398! image) lectotype designate by Jacques-Félix (1983); isolectotype LINN LINN-HS653-4! image).

(=) *Asterostoma rotundifolia* (Sm.) Blume, Mus. Bot. 1: 50. 1849.

(=) *Dissotis rotundifolia* (Sm.) Triana, Trans. Linn. Soc. London 28: 58. 1872 [1871].

(=) *Kadalia rotundifolia* Raf., Sylva Tellur.: 101. 1838.

(=) *Melastoma plumosum* D.Don, Mem. Wern. Nat. Hist. Soc. iv.: 290. 1823.

(=) *Heterotis plumosa* (D.Don) Benth., Niger Fl.: 348. 1849.

(=) *Dissotis plumosa* (D.Don) Hook.f., Fl. Trop. Afr. 2: 452. 1871.

Etymology

Named for its round, orbicular leaves.

Phenology

Collected in flower and fruit year-round.

Distribution and habitat

Guinea, Sierra Leone, Liberia, Nigeria, Cameroon, Equatorial Guinea, Gabon, Republic of Congo. Grows in forests and forest margins or clearings, along streams, roadsides, in plantations, and disturbed areas, sometimes creeping on boulders.

Conservation status

This species is widespread with no known major threats. It has been assessed as Least Concern on the IUCN Red List (Ghogue 2020).

Notes

Jacques-Felix (1983a) effectively lectotypified *H. rotundifolia* (Sm.) Jacq.-Fél. by citing “Afzelius (BM), Sierra Leone” as the type.

In the preparation of this synopsis, many specimens determined as *H. rotundifolia* were found to have distinctly excurrent emergences at the apex of the sepals, placing them in *H. prostrata*. In particular, all of the specimens examined from East Africa were either re-determined as *H. prostrata* or exhibited somewhat intermediate morphology. *H. rotundifolia* is likely less widespread in tropical Africa than presumed, and is possibly restricted to West tropical Africa, as suggested by Jacques-Félix (1971; 1983a). Further work is necessary to determine the species limits in this genus and in this treatment we exclude intermediate specimens.

Representative specimens examined

GUINEA. Guinée Maritime, Boké Préfecture, Kabata, Route de Kabat avers l’ouest, 10° 42’ 59” N, 14° 34’ 16” W, 10 m elev., fr. 24 Nov 2007, *Camara* 85 (K barcode K000460542!, HNG); Simandou Range, Moribadou to Canga East, 08° 35’ 36” N, 07° 51’ 28” E, 800 m elev., fl. 8 July 2006, *Cheek* 13312 (K barcode K000436912!); Préfecture de Coyah, Kakoulima, 09° 46’ 51.7” N, 13° 26’ 02.8” W, 542 m elev., fl. 1 Dec 2018, *Konomou* 632 (K barcode K001310314!); **SIERRA LEONE.** Gola National Park, central block, 07° 39’ 38.2” N, 10° 51’ 34.8” W, 370 m elev., fl. 03 Oct 2013, *Sesay* 105 (K barcode K001243830!); Northern Region, Tonkolili District, Sula Mts., Bantho Hill ridge above Bongbon-ga village, WNW of Numbara Hill, 09° 03’ 05” N, 11° 40’ 30” W, 750 m elev., fr. 02 Dec 2009, *Darbyshire* 609 (K barcode K000191460!, SL, FBC); Fourah Bay College, fl. 3 Oct 1967, *Morton & Jarr* SL4953 (K barcode K002834268!); **LIBERIA.** Zorzor–Gbarnga road, west

of St. Paul river, fl. 27 July 1966, *Bos* 2168 (K barcode K00283577!); Nimba, 450 m elev., 6 Oct 1971, *Adam* 26228 (K barcode K002834278!); 3 miles northeast of Suacoco, Gbarnga, Central Province, fl. 11 Oct 1950, *Daniel* 24 (K barcode K002834284!); **NIGERIA.** West, Ekiti, On the new road from Imesi-Igbajo, fl. 23 Oct 1972, *Latilo & Fagemi* 67514 (K barcode K002834323!); near Port Harcourt, on cleared ground 7 miles to N.E., fl. 24 Sept 1942, *Taylor* 7 (K barcode K002834327!); West state, Ibadan district, bush near Forestry School, fl. 20 Oct 1971, *Wit* 734 (K barcode K002834322!); **CAMEROON.** Cameroons Mnt, Above Buea, 1050 m elev., fl. 30 March 1952, *Morton* 6733 (K barcode K000050229!); **EQUATORIAL GUINEA.** Canetera de Musola, Fernando Poo, fr. 11 Jan 1947, *Guinea* 1259 (K barcode K002834440!); **GABON.** Ogooué-Maritime, Rabi-Kounga, c. 01° 42’ S, 09° 52’ E, fr. 16 Nov 1991, *Schoenmaker* 152 (K barcode K002834444!); Mitzi, 00° 47’ N, 11° 34’ E, 800 m elev., fl. 28 Aug 1957, *Holderness* 282 (K barcode K002834446!); **REPUBLIC OF CONGO.** Lekoumou Préfecture, Yakatopema (Moukouma), New MPD Camp. Forest patch at side of old village, Mousaou-junction with road, 500m from new village, 02° 53’ 21.0” S, 13° 36’ 44.0” W, fl. 29 Jan 2009, *Kami* 4198 (K barcode K000518748!); fl. 1860, *Grey* s.n. (K barcode K002834454!)

DISCUSSION

The genus *Heterotis* is widely naturalised across much of the tropics. Most specimens and records from outside of Africa are determined as *H. rotundifolia*, commonly called “Pink Lady”, which is classified as a weed or alien invasive species in several regions, including Puerto Rico, Australia, Singapore, and several Pacific islands (CABI 2014). However, there are also records of *H. prostrata* and *H. decumbens* from outside of mainland Africa, and the distribution of each species outside of their native ranges has not been clarified. In this synopsis, we only list the naturalised occurrences of *H. decumbens* which could be verified with specimens held at K: all of the collections of this genus at K from Madagascar and the Mascarene Islands are *H. decumbens*. Citing Bakhuizen van den Brink (1943) and Almeda (1990), Jacques-Félix (1995) suggested that early introductions to Java and Hawaii respectively both represent *H. rotundifolia*. However, Veranso-Libalah et al. (2017) state that the widely naturalised *Heterotis* across Asia, North America, Oceania, Central America and the Caribbean is in fact *H. prostrata*, wrongly identified as *H. rotundifolia*. It is difficult to distinguish between these species

from photos due to the necessity of careful examination of the apices of the sepals. However, citizen science records on iNaturalist suggest that both of these species are naturalised and potentially invasive outside of their native range (iNaturalist 2025), with many observations appearing to represent intermediate specimens.

Whereas at least three species of *Heterotis* are widespread and even naturalised and invasive outside of their native range, the genus contains two species preliminarily assessed in threatened categories according to IUCN Red List criteria, including the newly described, narrowly endemic *H. kupensis*. Cheek and Onana (2021) list 25 endemic and 30 near-endemic plant species currently known from Mt Kupe, of which 18 were not yet formally described at the time. The description of these new species is an urgent task; most undescribed species are threatened (Brown *et al.* 2023), yet their conservation status cannot be assessed for the IUCN Red List of Threatened Species until they are formally named. The description and assessment of threatened species is also critical for insuring their conservation *in situ*, for example through the identification and designation of Tropical Important Plant Areas (TIPAs) (Darbyshire *et al.* 2017). We herein contribute to the effort to characterise the endemic and unknown flora of Mt Kupe by formally describing *H. kupensis*, a species which was first recognised as new to science twenty years prior but has remained unnamed until now (Cheek *et al.* 2004). We provisionally assess *H. kupensis* as Vulnerable, providing further support for the protection of Mt Kupe as a critical site for preserving threatened and endemic plant diversity. Mt Kupe is designated as one of Cameroon's most high ranking Important Plant Areas with 145 threatened species on the IUCN Red List as of 2022, of which 19 are Critically Endangered, within its 145 km² (Murphy *et al.* 2023). It currently has no formal protection.

The new species described here is best placed in the genus *Heterotis* on the basis of morphological evidence. However, we caution that there is currently no mature fruiting material, precluding the description of seed characters which are an important trait for generic delimitation in Melastomataceae, including for *Heterotis*. Further, the staminal morphology is entirely unique for the genus. *Heterotis kupensis* also diverges from other members of the genus as characterised by Veranso-Libalah *et al.* (2017) in that it is an erect herb with stems that are woody at the base, rather than a decumbent herb. However, we note that both *Heterotis fruticosa* and *H. welwitschii* are also upright subshrubs, and some specimens of typically decumbent or prostrate species in the genus appear to be somewhat fruticose. We therefore

suggest that habit is not a reliable diagnostic feature for the genus.

We attempted to generate DNA sequences for the markers used by Veranso-Libalah *et al.* (2017) in order to provide molecular support for this species' placement in *Heterotis* but were unable to extract good DNA from the type specimen. Future collections of this species may reveal intraspecific variation, seed traits, or molecular evidence which may prompt re-examination of its generic placement within Melastomataceae. However, we consider its description an urgent task given its narrow endemism and apparent vulnerability to extinction, and we therefore describe it here as a morphologically unique member of *Heterotis*.

ACKNOWLEDGEMENTS

We thank Felix Forest and Laszlo Csiba for their efforts to obtain marker sequences for *H. kupensis* and Andrés Fonseca-Cortés for his help in making the distribution map for the new species. We thank Ian M. Turner, Marie Claire Veranso-Libalah, and Doug Stone for reviewing this manuscript. V.J.S. was funded by the NERC Science and Solutions for a Changing Planet Doctoral Training Programme (grant no. NE/S007415/1), the CASE component of which was funded by St. Andrews Botanic Garden. The botanical surveys in Cameroon which produced the material of *Heterotis kupensis* in this paper were mainly supported by Earthwatch Europe (1993–2005) and by the Darwin Initiative of the UK Government through the Plant Conservation of Western Cameroon and the Red Data Book of Cameroon projects, both led by the Royal Botanic Gardens, Kew, working with the IRAD-National Herbarium of Cameroon. Gaston Achoundong, former head of the National Herbarium of Cameroon (YA) and his successors including Jean Michel Onana and Barthelemy Tchiengué are thanked for their collaboration and support over the years. The funders had no role in study design, data collection and analysis, decision to publish or preparation of the manuscript.

REFERENCES

- Almeda F. 1990. Manual of the Flowering Plants of Hawaii. Chapter 65, Melastomataceae: 903–917.
- Bakhuizen van den Brink RC Jr. 1943. A contribution to the knowledge of the Melastomataceae occurring in the Malay Archipelago especially in the Netherlands East Indies. Medededeelingen van het Botanisch

- Museum en Herbarium van Rijks Univesrsiteit te Utrecht. 91:1–391.
- Bentham G. 1849. Melastomaceae. In: Hooker WJ. (Ed.), Niger Flora. London: Hippolyte Baillière; p. 344–358. <https://doi.org/10.5962/bhl.title.594>
- Brenan JPM. 1950. More new plants from the Idanre Hills, Nigeria. Kew Bulletin. 5(2):227–232. <https://doi.org/10.2307/4117229>
- Brown M, Bachman S, Lughadha EN. 2023. Three in four undescribed plant species are threatened with extinction. New Phytologist. 240:1340–1344. <https://doi.org/10.1111/nph.19214>
- Büttner R. 1889. Neue Arten von Guinea, dem Kongo und dem Quango. Verhandlungen Botanischen Vereins Provinz Brandenburg. 31:64–96.
- CABI (Centre for Agriculture and Bioscience International). 2014. *Heterotis rotundifolia* (pink lady). In: Invasive Species Compendium. [accessed 2025 Aug 15]. <http://www.cabi.org/isc/datasheet/120226>
- Cable S, Cheek M. 1998. The Plants of Mt Cameroon: a conservation checklist. Royal Botanic Gardens, Kew.
- Chapman J, Chapman H. 2001. The forests of Taraba and Adamawa States, Nigeria: an ecological account and plant species checklist. Christchurch, University of Canterbury.
- Cheek M, Alvarez-Aguirre MG, Grall A, Sonké B, Howes M-JR, Larridon I. 2018. *Kupeantha* (Coffeeae, Rubiaceae), a new genus from Cameroon and Equatorial Guinea. PLoS One. 13(6):e0199324. <https://doi.org/10.1371/journal.pone.0199324>
- Cheek M, Cable S, Hepper FN, Ndam N, Watts J. 1996. Mapping plant biodiversity on Mount Cameroon. In: van der Maesen LJG, van der Burgt XM, van Medenbach de Rooy JM, editors. Biodiversity of African Plants. Proceedings of the XIVth AETFAT Congress; Aug 22–27; Wageningen, Netherlands. Dordrecht: Kluwer. Pp. 110–120. https://doi.org/10.1007/978-94-009-0285-5_16
- Cheek M, Etuge M, Williams S. 2019. *Afrothismia kupensis* sp. nov. (Thismiaceae), Critically Endangered, with observations on its pollination and notes on the endemics of Mt Kupe, Cameroon. Blumea. 64(1):158–164. <https://doi.org/10.3767/blumea.2019.64.02.06>
- Cheek M, Onana J, Pollard BJ. 2000. The plants of Mount Oku and the Ijim Ridge, Cameroon: a conservation checklist. Royal Botanic Gardens, Kew.
- Cheek M, Pollard BJ, Darbyshire I, Onana JM, Wild C. 2004. The plants of Kupe, Mwanenguba and the Bakossi Mts, Cameroon: a conservation checklist. Royal Botanic Gardens, Kew.
- Cheek M, Achoundong G, Onana JM, Pollard B, Gossline G, Moat J, Harvey YB. 2006. Conservation of the plant diversity of Western Cameroon. In: Proceedings of the 17th AETFAT Congress; Addis Ababa, Ethiopia. p. 779–791.
- Cheek M, Harvey YB, Onana JM. 2010. The plants of Dom, Bamenda Highlands, Cameroon: a conservation checklist. Royal Botanic Gardens, Kew.
- Cheek M, Harvey Y, Onana J. 2011. The plants of Mefou Proposed National Park, Yaoundé, Cameroon: a conservation checklist. Royal Botanic Gardens, Kew.
- Cheek M, Onana JM. 2021. The endemic plant species of Mt Kupe, Cameroon with a new Critically Endangered cloud-forest tree species, *Vepris zapfackii* (Rutaceae). Kew Bulletin. 76(4): 721–734. <https://link.springer.com/article/10.1007/s12225-021-09984-x>
- Cheek M, Soto Gomez M, Graham SW, Rudall PJ. 2024. Afrothismiaceae (Dioscoreales), a new fully myco-heterotrophic family endemic to tropical Africa. Kew Bulletin. 79(1): 55–73. <https://link.springer.com/article/10.1007/s12225-023-10124-w>
- Chen L, van der Burgt X, Haba P, Kadereit G, Veranso-Libalah MC. 2025. Phylogenomics of African Melastomateae (Melastomataceae): Revisiting generic relationships, placement of three enigmatic taxa and description of two new genera. Taxon. 74: 857–873. <https://doi.org/10.1002/tax.13349>
- Cogniaux CA. 1891. Melastomaceae. In: de Candolle A, de Candolle C, editors. Monographiae Phanerogamarum. [A.DC. & C.DC.] 7. Paris: Sumptibus G. Masson. <https://doi.org/10.5962/bhl.title.45961>
- Darbyshire I, Anderson S, Asatryan A, Byfield A, Cheek M, Clubbe C, Ghrabi Z, Harris T, Heatubun CD, Kalema J, Magassouba S. 2017. Important Plant Areas: revised selection criteria for a global approach to plant conservation. Biodiversity Conservation. 26(8): 767–1800. <https://link.springer.com/article/10.1007/s10531-017-1336-6>
- Fernandes A, Fernandes R. 1954. Sur la position systématique de la section *Pseudodissotis* Cogn. du genre *Osbeckia* L. (Note préliminaire). Boletim Sociedade Broteriana sér 2. 28: 65–76.
- Fernandes A, Fernandes R. 1969. Melastomataceae africanæ novæ vel minus cognitæ V. Boletim Sociedade Broteriana. sér 2. 43: 285–306.
- Figueiredo E, Smith GF. 2008. Plants of Angola / Plantas de Angola. Pretoria, SANBI.
- GBIF. 2024. Global Biodiversity Information Facility. [accessed 2024 Aug 23]. <https://www.gbif.org/>
- Farr ER, Zijlstra G. (Eds.). 1996+. Index Nominum Genericorum (Plantarum). [accessed 2025 Aug 28]. <http://botany.si.edu/ing/>
- Gilbert MG. 1995. Melastomataceae. In: Edwards S, Mesfin T, Hedberg I. (Eds.), Flora of Ethiopia and Eri-

- trea. 2(2): 265–380. Addis Ababa and Uppsala: The National Herbarium and The Department of Systematic Botany, Uppsala University.
- Ghogue P. 2020. *Heterotis rotundifolia*. The IUCN Red List of Threatened Species 2020:e.T136663037A136663043. Accessed 09 Nov 2024. <https://doi.org/10.2305/IUCN.UK.2020-2.RLTS.T136663037A136663043.en>
- Harvey YB, Pollard BJ, Darbyshire I, Onana JM, Cheek M. 2004. The plants of Bali Ngemba Forest Reserve, Cameroon: a conservation checklist. Royal Botanic Gardens, Kew.
- Harvey Y, Tchiengué B, Cheek M. 2010. The plants of the Lebialem Highlands: a conservation checklist. Royal Botanic Gardens, Kew.
- iNaturalist contributors, iNaturalist (2025). iNaturalist Research-grade Observations. iNaturalist.org. Occurrence dataset <https://doi.org/10.15468/ab3s5x> accessed via GBIF.org on 2025-08-29.
- IUCN. 2012. IUCN Red List Categories and Criteria, Version 3.1. 2nd ed. Gland (Switzerland) and Cambridge (UK): Species Survival Commission, International Union for Conservation of Nature; [accessed 2025 Aug]. Available from: <http://www.iucnredlist.org/>
- IUCN Standards and Petitions Committee. 2024. Guidelines for using the IUCN Red List Categories and Criteria, Version 16. Gland (Switzerland): International Union for Conservation of Nature; [accessed 2025 Aug]. Prepared by the Standards and Petitions Committee. Available from: <https://www.iucnredlist.org/documents/RedListGuidelines.pdf>
- Jacques-Félix H. 1971. Note sur trois mélastomatacées d'Afrique. *Adansonia*, sér 2. 11(3): 546–549.
- Jacques-Félix H. 1981. Observations sur les caractères staminaux et la classification des Osbeckieae (Melastomataceae) capsulaires africaines. *Adansonia*, sér 2. 20(4): 405–429.
- Jacques-Félix H. 1983. Fl. Cameroun 24, Mélastomatacées. Yaoundé, Délégation Générale à la Recherche Scientifique et Technique.
- Jacques-Félix H. 1995. Histoire des Melastomataceae d'Afrique. *Bull Mus Natl Hist Nat, B, Adansonia*. 16(2-4): 235–311.
- Keay RWJ. 1953. Revision of the “Flora of the West Tropical Africa”: II. *Kew Bulletin*. 7(4): 543–548. <https://doi.org/10.2307/4117809>
- Maisels FG, Cheek M, Wild C. 2000. Rare plants on Mount Oku summit, Cameroon. *Oryx*. 34(2): 136–140. <https://doi.org/10.1046/j.1365-3008.2000.00107.x>
- Murphy B, Onana JM, van der Burgt XM, Ngansop Tchatchouang E, Williams J, Tchiengué B, Cheek M. 2023. Important Plant Areas of Cameroon. Royal Botanic Gardens, Kew.
- Onadeko AB, Rödel MO, Liedtke HC, Barej MF. 2014. The rediscovery of Perret's toad, *Amietophrynus perreti* (Schiotz, 1963) after more than 40 years, with comments on the species' phylogenetic placement and conservation status. *Zoosystematics and Evolution*. 90(2): 113–119.
- Richards PW. 1957. Ecological notes on West African vegetation: I. The plant communities of the Idanre hills, Nigeria. *Journal of Ecology*. 45: 563–577. <https://doi.org/10.2307/2256936>
- Stone RD, Ghogue JP, Cheek M. 2008. Revised treatment of *Memecylon* sect. *Afzeliana* (Melastomataceae: Olisbeoideae), including three new species from Cameroon. *Kew Bulletin*. 63(2): 227–241. <https://link.springer.com/article/10.1007/s12225-008-9033-y>
- Thiers B. continuously updated. Index Herbariorum: a global directory of public herbaria and associated staff. New York (NY): New York Botanical Garden's Virtual Herbarium; [accessed 2025 Apr]. <http://sweetgum.nybg.org/ih/>
- Triana J. 1872. Les Mélastomacées. *Transactions of the Linnaean Society London*. 28(1): 1–188.
- Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber WH, Li DZ, Marhold K, et al. 2018. International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. *Regnum Vegetabile*. 159. Glashütten (DE): Koeltz Botanical Books.
- Veranso-Libalah MC, Stone RD, Fongod AG, Couvreur TL, Kadereit G. 2017. Phylogeny and systematics of African Melastomataceae (Melastomataceae). *Taxon*. 66(3): 584–614. <https://doi.org/10.12705/663.5>
- Veranso-Libalah MC, Stone RD, Kadereit G. 2020. Towards a complete phylogeny of African Melastomataceae: Systematics of *Dissotis* and allies (Melastomataceae). *Taxon*. 69(5): 946–991. <https://doi.org/10.1002/tax.12317>
- Veranso-Libalah MC, Stone RD, Kadereit G, Guimarães PJF. 2022. Systematics and Taxonomy of the Tribe Melastomataceae. In: Goldenberg R, Michelangeli FA, Almeda F, editors. *Systematics, Evolution, and Ecology of Melastomataceae*. Springer. https://doi.org/10.1007/978-3-030-99742-7_21
- Wickens GE. 1975. Melastomataceae. In: Polhill RM, editor. *Flora of Tropical East Africa*. London: Crown Agents for Oversea Governments and Administrations.