




Six new species of *Barleria* L. (Acanthaceae) from Northeast Tropical Africa

Ensermu Kelbessa¹ & Iain Darbyshire² 

Summary. Six new species of *Barleria* L. (Acanthaceae) are described from northeast tropical Africa: *B. gidoleensis* Ensermu & I. Darbysh., *B. baluganii* Ensermu, *B. ferox* Ensermu & I. Darbysh. and *B. negeleensis* Ensermu & I. Darbysh. from Ethiopia and *B. ensermui* I. Darbysh. and *B. shebelleensis* Ensermu & I. Darbysh. from Somalia. All the species are illustrated and their affinities and conservation status are discussed. A note on the presence of *B. parviflora* R. Br. ex T. Anderson in northern Somalia is also included. In addition, a foreword is presented on the great contribution to Acanthaceae taxonomy and African botany made by Professor Ensermu Kelbessa, who sadly passed away in August 2016.

Key Words. Flora, Horn of Africa, IUCN conservation assessment, rare species, taxonomy.

Foreword: in memory of Professor Ensermu Kelbessa

The paper published here has been several years in the planning, stemming from the treatment of the Acanthaceae for the *Flora of Ethiopia & Eritrea* (Ensermu 2006) and from related studies on the genus *Barleria* in Northeast Tropical Africa. Ensermu and I had first agreed to publish these new species together during one of his many research visits to the Royal Botanic Gardens, Kew. He provided me with a draft manuscript and asked me to contribute extra information that I had acquired through my preparation for the *Flora of Tropical East Africa* account and wider studies of the genus, and to trace the illustrations that he had earlier commissioned at Kew. It is my deep regret that, whilst this task was always in my mind to complete, progress was slow due to other commitments and the manuscript was never quite finished. In August 2016, we received the tragic news that Ensermu had passed away suddenly, which was a great shock to all that knew him. On coming to terms with this untimely passing, I was resolved to complete the *Barleria* manuscript as a contribution to Ensermu's great legacy to African botany. In doing so I have taken the opportunity to name a species in his honour — *Barleria ensermui* I. Darbysh. — to commemorate his great contribution to botany and as a show of gratitude for his kind assistance when I was starting out as an Acanthaceae taxonomist and

his continued help over the past decade. This is a species that Ensermu and I had previously discussed and agreed was new to science but which needed a full description and diagnosis.

A full and fitting obituary to Ensermu has been written by his great friend and colleague Prof. Sebsebe Demissew, with assistance from Dr Benny Bytebier and others (Sebsebe Demissew *et al.* 2016), and I will not repeat here all the information provided, except to say some words on his important contribution to Acanthaceae taxonomy.

Ensermu's interest in the Acanthaceae family was first ignited by Prof. Olov Hedberg of Uppsala University who introduced him to the remarkable variation in pollen morphology within the family. He conducted a palynological study of *Asystasia* Blume and related genera for his M.Sc. thesis at Addis Ababa University (Ensermu 1982). He later went on to study towards a Ph.D. under the supervision of Dr Mats Thulin at Uppsala University with the support of a scholarship from the *Ethiopian Flora Project*, a wonderful collaboration between the Department of Systematic Botany at Uppsala and the National Herbarium at Addis Ababa University. Through these studies, he produced a detailed taxonomic revision of *Justicia* L. sect. *Ansellia* C. B. Clarke (Ensermu 1990), a complex group of 12 species from Africa and southern Arabia, publishing two new species in the process (Ensermu 1989a). This excellent work is the authoritative account on this challenging group.

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Ensermu was to continue to return to the genus *Asystasia* throughout his career, publishing or co-publishing eight new species and refining the generic delimitation (Ensermu 1989b, 1993, 1998; Ensermu *et al.* 1992; Vollesen & Ensermu 2010) and revising the horticulturally and ecologically important *Asystasia gangetica* (L.) T. Anderson complex (Ensermu 1994) amongst other achievements. Undoubtedly his greatest taxonomic achievement, however, was the writing of the treatment of the Acanthaceae family for the *Flora of Ethiopia and Eritrea* (Ensermu 2006). This major undertaking covers 40 genera and 205 species, many of which were poorly known prior to this excellent account. This work, and the draft manuscripts that Ensermu kindly shared with Dr Kaj Vollesen and myself, were of great assistance in the writing of the treatment of Acanthaceae for *Flora of Tropical East Africa*, and indeed Ensermu was a co-author on the second of that two-part account (Darbyshire *et al.* 2010). In total, Ensermu published 21 new species to science and added a further three new name combinations, all in the Acanthaceae family.

Ensermu was a skilled, careful and thorough taxonomist, with a passion for seeing the plants that he studied in their natural environment through extensive fieldwork as well as in herbaria. He produced work of a consistently high quality that will long be used as key references in our understanding of Acanthaceae systematics. He was also a passionate advocate of plant conservation and the protection of rare and threatened species, with a great love for and knowledge of the Ethiopian flora (see for example Vivero *et al.* 2005, 2006). He was an excellent mentor to his many students and a close friend and colleague to the many plant taxonomists, ethnobotanists, ecologists and conservationists who shared his passion for African plants. We have lost a true champion of African botany.

Prof. Ensermu Kelbessa was warmly remembered through a memorial lecture event held at Addis Ababa University on 20th February 2017, attended by many of his friends, colleagues and family members, at which I had the honour of presenting on his contribution to African plant taxonomy and conservation.

Iain Darbyshire, Royal Botanic Gardens, Kew.

Introduction

Barleria L. is one of the largest genera of Acanthaceae, comprising approximately 300 species (Ensermu 2006; Darbyshire 2010). It is particularly diverse in the dry woodlands and bushlands of eastern, northeastern and southern tropical Africa (Balkwill & Balkwill 1998), and many of the species have highly restricted ranges and are of high conservation concern (Darbyshire & Luke 2016).

In volume five of the *Flora of Ethiopia and Eritrea* (Hedberg *et al.* 2006 — FEE), 39 species of *Barleria* were treated, including 11 that were considered to be potentially new species to science but, due to time pressures to complete the Flora volume, were not formally named and published (Ensermu 2006). During the preparation of the FEE manuscript, several as then un-named species were also observed in herbarium material from neighbouring Somalia and provisional descriptions were made by the first author of the current paper. Some of these Somali taxa were subsequently delimited in full during preparation of the *Flora of Somalia* account of *Barleria*, where Hedrén documented 25 species (Hedrén 2006a), four of which were treated as new species — *B. albomarginata* Hedrén, *B. dentata* Hedrén, *B. glaucobracteata* Hedrén and *B. ilicifolia* Hedrén — and one of which was raised from varietal to species rank — *B. linearifolia* Rendle var. *brevispina* Fiori = *B. brevispina* (Fiori) Hedrén. The new names published in that volume were briefly *nomina nuda* but later in the same year, Hedrén (2006b) formally validated them. *Barleria glaucobracteata* has subsequently been synonymised within *B. quadrispina* Lindau (Darbyshire 2010). Several other apparently distinct species of *Barleria* from Somalia were listed only as Notes under the related species treated by Hedrén (2006a) and remain undescribed. Some of these, those that have been recorded close to the Ethiopian border and so may be found within Ethiopia in the future, were included in the key to species of *Barleria* in FEE (Ensermu 2006: 402 – 404).

In this paper, six species of *Barleria* are formally described from Northeast Tropical Africa. Four of these are from amongst the 11 species treated as *Barleria* spp. in FEE and two are species from Somalia that were noted as potentially distinct in the *Flora of Somalia* treatment and included in the key to species in FEE.

Of the seven other “*Barleria* spp.” of FEE, “*B. sp.* (= Gereau 1320)” [sp. 3 of FEE] is probably one of the many forms of *B. ventricosa* Nees (I. Darbyshire, pers. obs.); “*B. sp.* (= Burger 3373)” [sp. 26 of FEE] is now known to be *B. brevispina* (Hedrén 2006a), but with white-flowered plants from the Sidamo region considered to be a form of *B. polhillii* I. Darbysh., and “*B. sp.* (= Mooney 5618)” [sp. 30 of FEE] has been matched with *B. marginata* Oliv. (Darbyshire 2010). The remaining four are still considered to be probable new species to science but there is insufficient material of each for formal description at this stage. This is similarly the case for a number of potentially new species from Somalia where further collecting efforts targeting *Barleria* are very likely to yield further new discoveries.

During preparation of this paper, a small error was detected in the key to *Barleria* for the *Flora of Ethiopia & Eritrea* for which the number of seeds was mixed up in couplet 2; it is corrected below:

- 2 Capsule 4-seeded, not prominently beaked.....11
 Capsule 2-seeded (except in *B. grandis* where 4-seeded),
 prominently beaked.....26

Species accounts

The descriptions of the new species are based primarily on the study of herbarium material held at the ETH and K herbaria. All specimens and duplicates cited have been seen by at least one of the two authors. The provisional conservation assessments follow the Categories and Criteria of IUCN (2012). Only Extent of Occurrence (EOO) is used as a measure of species range size as information on the new species is considered to be too limited to calculate Area of Occupancy (AOO) with any accuracy, except in the case of *Barleria baluganii* where AOO can be used with more confidence.

***Barleria gidoleensis* Ensermu & I. Darbysh. sp. nov.**

Type: Ethiopia, Gamo Gofa Region: 49 km SW of Arba Minch on hillside leading to Gidole, c. 5 km N of Gidole, fl. & fr. 22 Nov. 1973, Ash 2264 (holotype ETH; isotype K).

<http://www.ipni.org/urn:lsid:ipni.org:names:77167050-1>

Barleria sp. (= *Ensermu K. & Zerihun W.* 612) sensu Ensermu (2006: 409), pro maj. parte.

Spiny shrub 1 – 1.8 m high and to 1.8 m wide; stems soon turning woody, much-branched, pilose with long-stalked glandular hairs, and with up to 2 mm long bristly hairs; internodes very short, up to 10 – 20 mm long. *Leaves* subsessile, blade ovate to sub-orbicular, up to 15 – 18 × 11 – 17 mm, base cordate or rounded, margins entire, apex mucronate, pilose beneath with long-stalked glandular hairs and bristly hairs, nearly glabrous above; lateral veins 3 – 4 pairs, raised beneath, nearly indistinct above. *Axillary spines* with stalk nearly lacking or to 6 mm long, 2-branched; branches widely divergent, ± straight 14 – 24 mm long, grey, glandular-pubescent except the spinose apex which is glabrous. *Flowers* axillary, solitary, stalked, bracteoles terminating 2 – 4 mm long common stalk (peduncle), the 2 bracteoles each 18 – 25 × 1 mm, spiny, pubescent with glandular hairs and bristly hairs; pedicel 2 – 4 mm long, pubescent with glandular and bristly hairs. *Calyx* with anterior and posterior lobes sub-equal, narrowly oblong, 13 – 15 × 3 – 4 mm, apex mucronate, external surfaces pubescent with glandular hairs and ascending bristly hairs; lateral lobes linear-subulate, 10.5 – 14.5 × 2 mm, apex mucronate, indumentum as outer lobes. *Corolla* light blue-violet or pale blue (black in dry state), (42 –) 49 – 54 mm long; tube 34 – 36 mm long, ± 5 mm broad at base, ± 10 mm

at mouth, pubescent externally and at base of filaments internally; limb 5-lobed in weak “2+3” configuration, lobes sub-equal, 18 – 20 × 8 – 10 mm, oblong-elliptic, ± rounded at apex, pubescent externally, adaxial pair of lobes separated from tube 2 mm below the other 3 lobes and slightly smaller, ± 3 mm broad at base, the other 3 lobes ± 4 mm broad at base. *Stamens* inserted ± 16 mm above base of corolla tube, exerted from corolla tube for ± 13 mm of their length; filaments 23 – 31 mm long, pilose at base; anthers ± 6 mm long; staminodes 3, filaments 5 – 6 mm long, antherodes absent. *Ovary* ± 4 mm long, black, surrounded by disc in proximal half, glabrous; style ± 50 mm long, glabrous; stigma sub-capitate. *Capsule* 22 – 26 × 7 mm, black to dark brown, shining, glabrous, 4-seeded; seeds ± 7 × 6 mm, triangular-ovate in face view, with golden-yellow hygroscopic hairs. Fig. 1.

RECOGNITION. *Barleria gidoleensis* is morphologically closest to *B. longissima* Lindau and is very similar vegetatively, but it differs in having a much smaller corolla (42 –) 49 – 54 mm long (vs 110 – 126 mm long) with the tube narrow in its lower portion and gradually enlarged towards the mouth and its lobes separated at different levels (vs corolla with very long and uniformly cylindrical tube and the lobes separated at the same level in *B. longissima*); a much shorter style, ± 50 mm long (vs 120 – 130 mm long in *B. longissima*); and smaller calyx with the outer lobes 13 – 15 mm long (vs 19 – 22 mm long).

DISTRIBUTION. *Barleria gidoleensis* is restricted to Gamo Gofa and Sidamo Floristic Regions in southern Ethiopia. Map 1, green triangles.

SPECIMENS STUDIED. ETHIOPIA. Gamo Gofa Region: 49 km SW of Arba Minch on hillside leading to Gidole, c. 5 km N of Gidole, 1400 m, 22 Nov. 1973, Ash 2264 (ETH holotype, K isotype); eastern slopes of Gughe highlands above Arba Minch, c. 6°03'N, 37°35'E, 1700 – 2000 m, 3 Sept. 1975, Gilbert, Thulin & Getachew T. 517 (ETH, K, UPS); 4 km N of Gidole, 24 Dec. 1983, Ensermu K. & Zerihun W. 612 (ETH). Sidamo Region: Amaro Mts, Ridge, c. 5°39'N, 38°06'E, 5800 ft [1770 m], 14 Dec. 1952, Gillett 14753 (K).

HABITAT & ECOLOGY. *Barleria gidoleensis* occurs in bushland and scrub of *Dodonaea viscosa* (L.) Jacq. var. *angustifolia* (L. f.) Benth. and in *Acacia-Combretum* open woodland transitioning to *Juniperus procera* Hochst. ex Endl. forest. At one site it was recorded from an assemblage of *Dodonaea* with *Pterocephalus frutescens* Hochst. ex A. Rich., *Ipomoea kituiensis* Vatke, *Echinops macrochaetus* Fresen., *Acanthus sennii* Chiov. and *Piliostigma thonningii* (Schumach.) Milne-Redh. It grows at 1400 – 2000 m elevation.

CONSERVATION STATUS. This species is currently known from three localities and has an EOO of c. 1450 km², which falls within the Endangered range threshold for IUCN Criterion B1. None of its known localities are

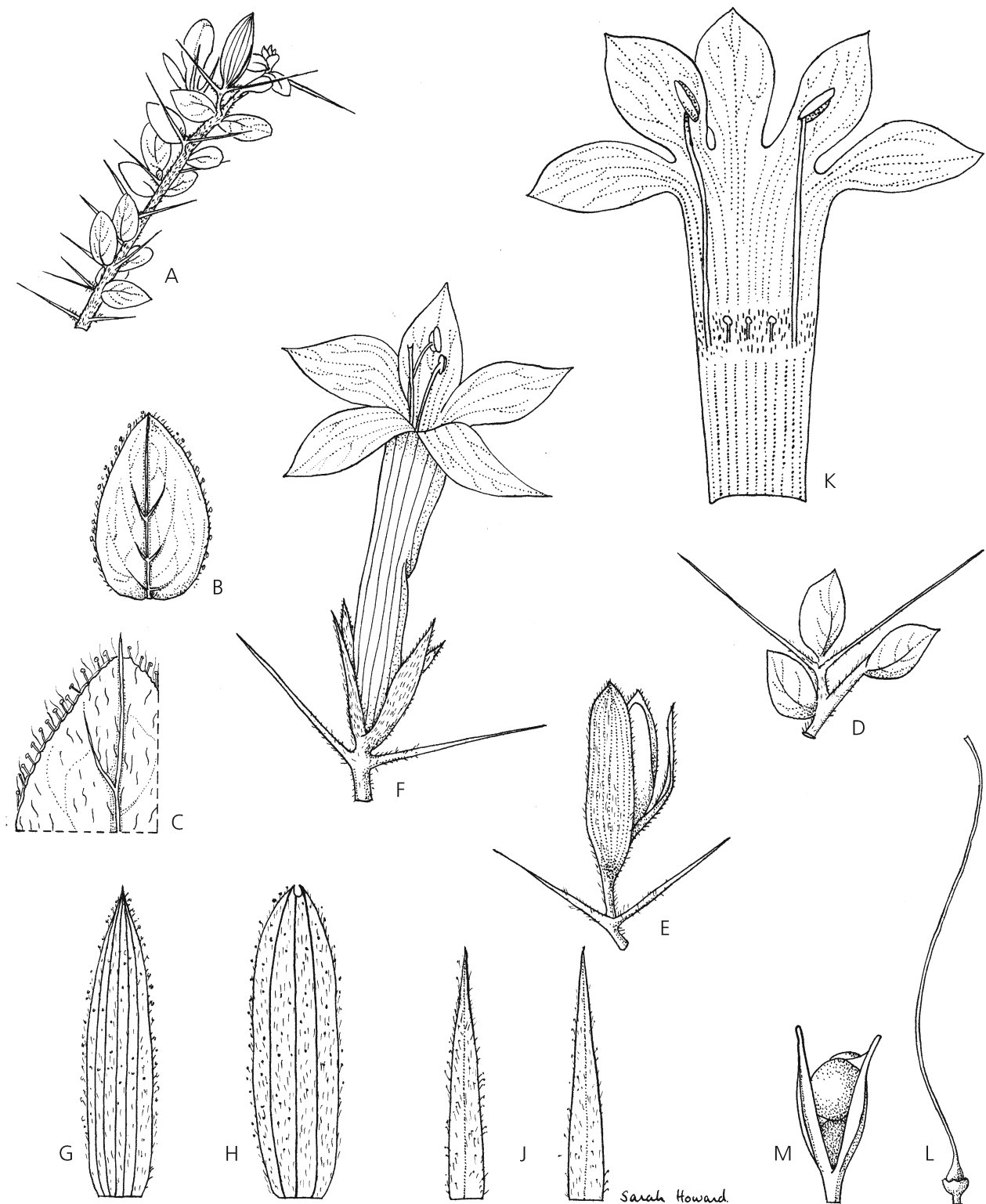
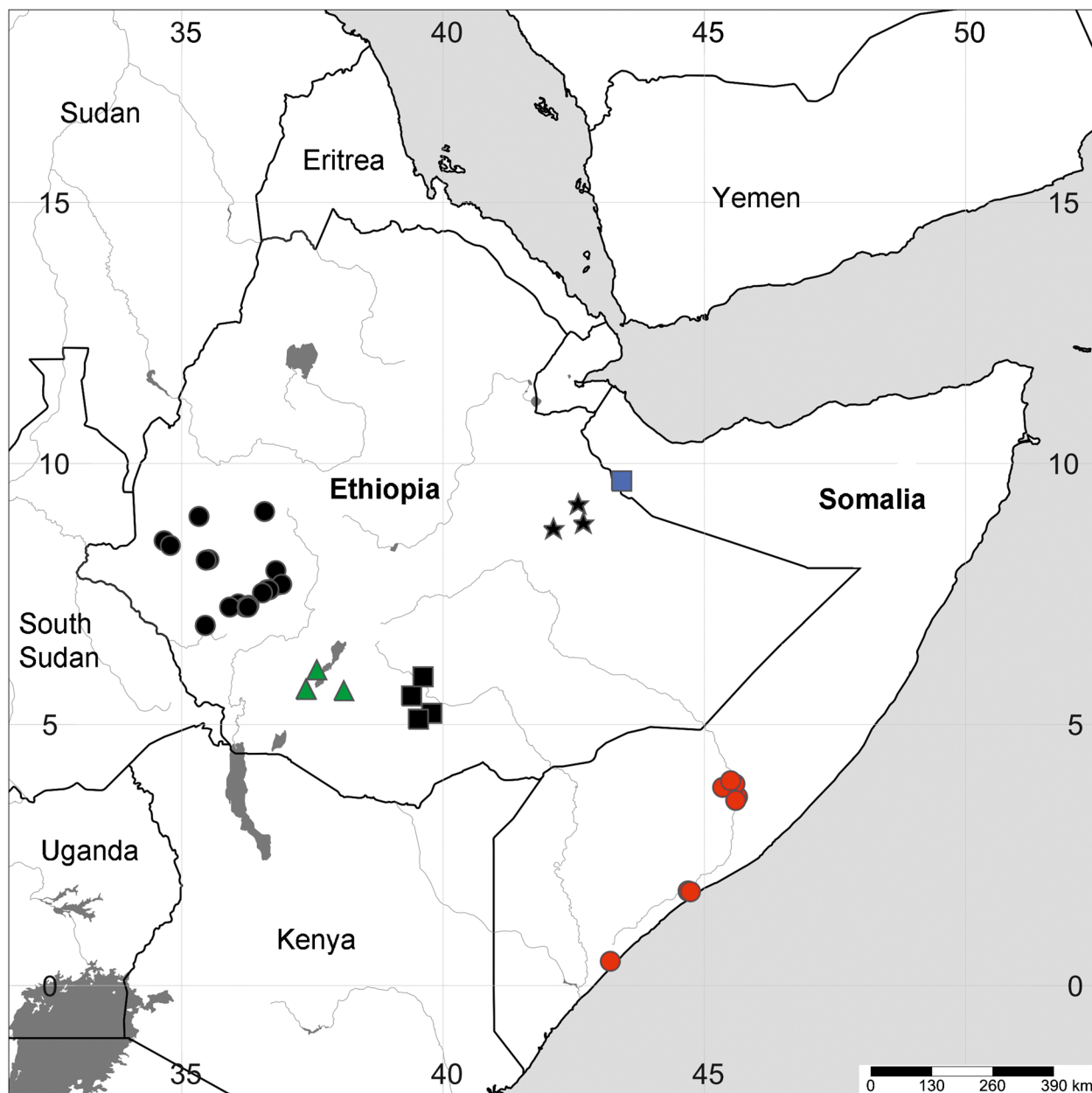


Fig. 1. *Barleria gidoleensis*. A flowering branch $\times 1$; B leaf blade, abaxial surface $\times 2$; C leaf blade, apical portion $\times 30$; D detail of spines $\times 1.5$; E flower bud with subtending bracteoles $\times 2$; F open flower $\times 1.5$; G posterior calyx lobe $\times 4$; H anterior calyx lobe $\times 4$; J lateral calyx lobes $\times 4$; K dissected corolla with androecium $\times 1.5$; L gynoecium with disc $\times 1.5$; M capsule with seeds, dehiscent $\times 1.2$. A – D & L from Ash 2264; E – K & M from Ensermu K. & Zerihun W. 612. DRAWN BY SARAH HOWARD.

within Protected Areas, although the Nechisar National Park falls partly within its EOO. Google

Earth imagery indicates that there has been extensive conversion to agricultural land in the Gidole area,



Map 1. Distribution of new species of *Barleria* in Ethiopia and Somalia: *B. gidoleensis* (green triangles); *B. ensermui* (blue square); *B. baluganii* (black circles); *B. ferox* (black stars); *B. negeleensis* (black squares); *B. shebelleensis* (red circles).

whilst the SE slopes of the Gughe highlands are being impacted by the rapid expansion of Arba Minch town and associated villages. Whilst this species may be able to tolerate some disturbance, as it appears to grow in secondary assemblages such as *Dodonaea* scrub, it will be adversely impacted by habitat clearance for settlement and agriculture. With known threats to two of its three locations (the Sidamo location is too vague to consider likely threats), this species is considered to be **Endangered EN B1ab(iii)**.

ETYMOLOGY. *Barleria gidoleensis* is named after the small town (and administrative unit) of Gidole, which is near to the type locality for this species.

NOTES. The four-seeded capsule, fusiform in face view and lacking a prominent beak, places this species in sect. *Barleria* (Balkwill & Balkwill 1997; Darbyshire 2009). Based on their morphological similarity, it is clearly closely allied to *B. longissima* Lindau, a rare Ethiopian endemic species that also occurs in Gamo Gofa and Sidamo Floristic Regions. However, they are easily separated by the characters listed in the Recognition section, in particular the much shorter and less strictly cylindrical corolla tube of *B. gidoleensis*. Similar species pairs are found elsewhere in *Barleria* sect. *Barleria*, for example *B. gracilispina* (Fiori) I. Darbysh. and *B. paolioides* I.

Darbysh. from east and northeast Africa, the former having a long, strictly cylindrical corolla tube and subregular limb and broad outer calyx lobes, the latter having a short and narrowly funnel-shaped corolla tube and a more zygomorphic limb, and narrow outer calyx lobes (Darbyshire 2010). In this latter case, there is an intermediate species from Somalia that may be of hybrid origin, *B. paolii* Fiori.

In the FEE treatment, *Barleria gidoleensis* was considered to be conspecific with specimens from northern Kenya including *Verdcourt & Dale* 2216 (K) (Ensermu 2006). However, the Kenyan plants were later named *B. ramulosa* C. B. Clarke var. *dispersa* I. Darbysh. and several key differences were noted to *B. gidoleensis* (Darbyshire 2010). These include shorter axillary spines and bracteoles (7–20 mm long), shorter lateral calyx lobes (5–9.5 mm long), smaller corollas (21–41 mm long) with a considerably narrower tube and less oblong lobes, shorter staminal filaments (11–18 mm long), and smaller capsules (11–20 mm long) in *B. ramulosa*.

Barleria gidoleensis is also strikingly similar to *B. molensis* Wild, a species restricted to the serpentine of the Great Dyke in Zimbabwe (see Darbyshire 2015: 59). They share a similar habit, indumentum and corolla morphology, although plants of *B. gidoleensis* appear to be larger and usually have a shorter corolla tube. They are most easily separated by the differing leaf shape, *B. molensis* having elliptic or obovate leaves with a cuneate or attenuate base, by the larger calyces in *B. molensis* (posterior lobe 20–26 × 4–9 mm), and by the differing flower colour, those of *B. molensis* being white, although they can fade to pale bluish (pale blue to blue-violet in *B. gidoleensis*). It would be interesting to carry out molecular analyses to see if these geographically and ecologically disjunct species are closely related.

The duplicate at K of the specimen *Gilbert et al.* 517 differs from other material seen (and even from the duplicate of this specimen at UPS) in bearing smaller axillary spines and less glandular hairs; there is no mature flower on the K sheet, but the UPS sheet has a mature flower that is a good match for *Barleria gidoleensis*. The K sheet is probably just from an immature plant.

***Barleria ensermii* I. Darbysh. sp. nov.** Type: Somalia, plain on Buramo – Hargeisa road, 28 miles E of Buramo, fl. & fr. 13 Feb. 1933, *Gillett* 4999 (holotype K 000963594; isotype K 000963593).

<http://www.ipni.org/urn:lsid:ipni.org:names:77167078-1>

Barleria mucronifolia sensu Hedrén (2006a: 429), pro parte quoad *Gillett* 4999, non Lindau.

Barleria sp. (= *Gillett* 4999) sensu Ensermu (2006: 403).

Dwarf, harshly spiny shrublet, much branched with short internodes and contracted lateral branches, stems somewhat quadrangular, white-puberulous, the hairs retrorse. *Axillary spines* paired, of sterile, reduced bracteoles, 7–18 × 1–3.5 mm, curved, with few spines along margins. *Leaves* on short petiole to 1.5 mm long or subsessile; blade elliptic or somewhat oblanceolate, 9–14 × 4–6 mm, base cuneate-attenuate, margin entire, apex acute and mucronate for up to 1 mm, surfaces white-puberulous, the hairs curled, and with longer pale yellow-buff ascending or appressed hairs; lateral veins 3–5 pairs, these and midrib pale and ± prominent beneath. *Inflorescences* axillary and sub-terminal, 2–6-flowered (sub)sessile contracted unilateral cymes up to 2.5 cm long at maturity; bracts foliaceous; bracteoles at first purple-brown, later turning pale-scarious, pairs unequal, larger of each pair held adjacent to calyx, lanceolate, 18–27 × 4.5–9 mm, base abruptly widened and rounded, margin with 2–4 lateral spines per side up to 2.5–4.5 mm long, apex attenuate into a long spine, this often somewhat curved; smaller bracteole of each pair held adjacent to inflorescence axis, shorter and narrower than the larger one; pair of bracteoles at base of inflorescence usually narrower, the larger 3.5–4.5 mm wide, and with a more cuneate-attenuate base; flowers sessile. *Calyx* in dry state at first purple-brown with darker palmate-reticulate venation, later turning pale-scarious; anterior lobe (oblong-) elliptic or obovate, 11.5–15 × 4.5–8 mm, base cuneate or attenuate, margin with small spinulose bristle-tipped teeth in distal half, apex with one or often two short spines to 1 mm long, external surface with long pale-buff ascending hairs and few to numerous short white curled hairs, also with scattered short-stalked cup-shaped orange glands and few minute glandular hairs; posterior lobe as anterior lobe but up to 17 × 11.5 mm excluding long apical spine 3.7–9 mm long, margin with 2 or 3 conspicuous spines to 1.5–4.5 mm long in distal half on each side; lateral lobes linear-lanceolate, 6.5–8 mm long, ascending-pubescent and with short glandular hairs towards apex. *Corolla* pale blue, 37–42 mm long, pubescent externally with mixed glandular and eglandular hairs; tube 24–25 mm long, cylindrical and 3 mm wide below insertion point of stamens, gradually funnel-shaped distally, mouth 6–8 mm wide; limb in weak “4+1” configuration, abaxial lobe offset by ± 3 mm, all lobes obovate, 11–14.5 mm long, abaxial and lateral lobes, 7.5–10 mm wide, apices rounded, adaxial lobes 7–8.5 mm, apices with short attenuate tip. *Stamens* inserted 11.5–12.5 mm from base of corolla tube; filaments 21–23 mm long, pubescent at base; anthers 2.2–2.5 mm long; lateral staminodes with filaments 2.5–3 mm long, pubescent; antherodes well-developed, 0.7–0.9 mm long, bearing a few pollen grains; adaxial staminode 2.6 mm long, antherode absent. *Ovary* 3–3.5 mm long, glabrous;

style c. 35 mm long, crisped-puberulent towards base, densely so at attachment point; stigma clavate, 0.6 – 0.75 mm long. *Capsule* only seen in immature state, fusiform with very short beak, 12.5 – 13 × 5 mm in face view, glabrous; seeds not seen. Fig. 2.

RECOGNITION. *Barleria ensermii* has previously been confused with *B. mucronifolia* Lindau but clearly differs in corolla morphology: *B. ensermii* has a markedly shorter corolla tube 24 – 25 mm long (vs 33 – 40 mm long), with a shorter basal cylindrical portion below the insertion point of the stamens, this being 11.5 – 12.5 mm from the base in *B. ensermii* (vs 17 – 24 mm from the base), and a more markedly funnel-shaped throat, and has larger and more divergent corolla lobes 11 – 14 mm long (vs 7 – 11 mm long, not markedly divergent). They also differ in the shape of the outer calyx lobes, those of *B. ensermii* being (oblong-) elliptic or obovate with base cuneate or attenuate (vs broadly ovate with cordate base) and in the posterior lobe having strictly marginal spines in the distal half (vs margin subentire or if spiny then spines in the proximal half being submarginal).

DISTRIBUTION. *Barleria ensermii* is currently known only from the type collection from Somaliland in northwest Somalia close to the Ethiopia border (*Flora of Somalia* region N1). Map 1, blue square.

SPECIMEN STUDIED. SOMALIA. Somaliland, plain on Buramo [Borama] – Hargeisa road, 28 miles E of Buramo, c. 9°40'N, 43°25'E, [5200 ft] 1580 m, fl. & fr. 13 Feb. 1933, Gillett 4999 (K, holotype & isotype).

HABITAT & ECOLOGY. *Barleria ensermii* was recorded from amongst grass in open *Acacia* woodland over gneiss at c. 1580 m elevation.

CONSERVATION STATUS. This species is known only from the type gathering made in 1933, when it was recorded as abundant at the type locality. Google Earth imagery shows that this area is now intensively farmed, with many strip-like fields clearly visible across the plains and gulleys, particularly south of the Buramo-Hargeisa road. This area has been farmed for at least 50 years (Ahmed Ibrahim Awale, pers. comm. via H. Pickering). In view of the significant habitat loss, this species may well be globally threatened, but with no recent information and with only one historical collection known, it must currently be considered **Data Deficient (DD)**.

ETYMOLOGY. As noted in the introduction, this species is named in honour of Ensermu Kelbessa (1952 – 2016) to acknowledge his important contribution to African botany.

NOTES. *Barleria ensermii* falls within sect. *Barleria* and appears to be allied to other spiny species in this section from northeast Africa; it is compared to potential confusion species in Table 1. Hedrén (2006a) included it within *B. mucronifolia* but noted that “Gillett 4999 from N1 stands out by having large

funnel-shaped flowers up to 25 mm across and more spiny calyx lobes with apical spine up to c. 12 mm long” (p. 429). The apical spine character does not appear to differentiate the two species, but the marked differences in corolla and calyx morphology clearly separate these two as distinct species (see Recognition section, and Table 1). *B. mucronifolia*, including *B. homioitricha* C. B. Clarke which was the name used in Ensermu (2006), is widespread in the Horn of Africa and extends to Yemen.

The corolla morphology of *Barleria ensermii* is more reminiscent of *B. steudneri* C. B. Clarke from Eritrea, Ethiopia, Kenya, Sudan and Uganda. However, that species has longer, trailing-decumbent leafy stems with larger leaves 20 – 55 mm long and has markedly different calyces, the anterior and posterior lobes being broader (the latter 12 – 17 mm wide) and with a lacinate-toothed margin which is also conspicuously bristly-ciliate. *B. steudneri* also has shorter staminal filaments and larger anthers than *B. ensermii* (see Table 1).

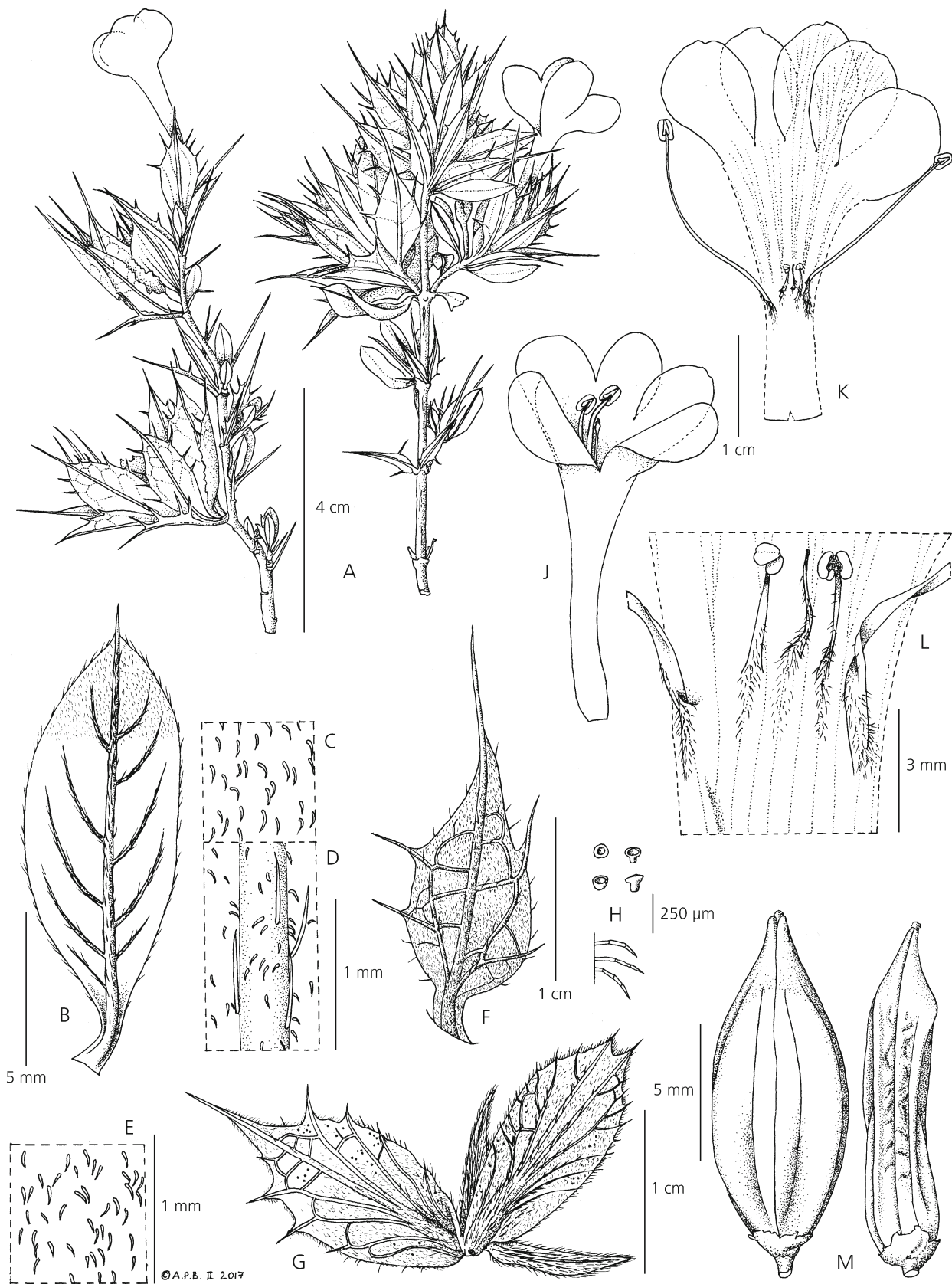
A final species worthy of mention is *Barleria delamerei* S. Moore from southern Ethiopia, Kenya and northern Tanzania, which was recorded under its synonym *B. spinisepala* E. A. Bruce in Ensermu (2006). This species also has a similar corolla morphology but is easily separated from *B. ensermii* by, amongst other differences, having single-flowered inflorescences, linear or narrowly lanceolate bracteoles with a narrower blade, in usually having narrower, lanceolate to oblong-elliptic calyx lobes, 2 – 6 mm wide which if at the wider end of this range, are more regularly spiny along the margin, and in the external surface of the calyces and bracteoles lacking large short-stalked cup-shaped glands. *B. delamerei* is not known from Somalia — the record of *B. spinisepala* in Hedrén (2006a) is erroneous; see Darbyshire (2010).

***Barleria baluganii* Ensermu sp. nov.** Type: Ethiopia, Welega Region, Kelem Awraja, c. 13 km S of Dambidollo on the way to Gambella, 1990 m, fl. 18 Nov. 1981, Mesfin T. & Kagnev G. Y. 2347 (holotype ETH sheet 1; isotypes ETH sheet 2, K).

<http://www.ipni.org/urn:lsid:ipni.org:names:77167079-1>

Barleria sp. (= *Ensermu* K. & *Tamrat* B. 454) sensu Ensermu (2006: 405).

Scrambling or climbing woody herb up to 2 – 5 m high; stems channelled, black or dark green (-brown) in dry state, glabrous except for some bristly hairs at the nodes and on distal-most internodes, these also with two lines of pale retrorse hairs; internodes 5 – 13 cm long. *Leaves* on petioles 4 – 30 mm long, glabrous or shortly pubescent above; blade ovate or ovate-elliptic,



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Fig. 2. *Barleria ensermui*. A habit, two flowering branches; B leaf, abaxial surface; C detail of retrorse hairs on abaxial leaf surface; D detail of long hairs along midrib on abaxial leaf surface; E detail of stem indumentum; F bracteole, external surface; G dissected calyx, external view; H detail of posterior calyx lobe hairs: multicellular marginal hairs, and cup-shaped glands from external surface; J flower; K dissected corolla with androecium; L detail of staminodes; M capsule, face and lateral views. From Gillett 4999. DRAWN BY ANDREW BROWN.

7 – 16 × 3 – 6 cm, broadest below the middle, base cuneate to attenuate, margins entire, apex short- or often long-acuminate, surfaces largely glabrous except for sparse appressed bristly hairs along main veins beneath and on margin, adaxial surface sometimes with scattered appressed hairs; lateral veins 5 – 6 pairs, strongly ascending. *Inflorescences* of 3 – 7- or more (rarely 1 – 2- when young) flowered cymes borne in the upper leaf-axils and terminally, at 3 – 7 nodes, the lower cymes alternate and distant, the upper opposite and condensed, together forming an interrupted terminal thyrse; bracts foliaceous but reducing rapidly up the thyrse, those in distal portion ovate-elliptic to narrowly elliptic, 15 – 28 × 4 – 13 mm, indumentum as that of leaves; bracteoles linear to narrowly oblanceolate, 4 – 12 × 0.5 – 2 mm or those of first flowers in several-flowered cymes can be larger, oblanceolate or

even elliptic, 10 – 15 × 2 – 6 mm, sparsely pubescent with bristly hairs mostly along margins, with or without few glandular hairs, or nearly glabrous. *Calyx* with lobes unequal, anterior lobe ovate-elliptic, 10 – 16 × 4 – 7 mm, apex bifid with 0.5 – 4 mm long lobes; posterior lobe 11 – 17 × 6 – 8 mm, apex entire, acute to attenuate, both pubescent with bristly hairs, these appressed on external surface, longer and ascending along margin where sometimes bulbous-based and forming small teeth, external surface with or without sparse short spreading glandular hairs; lateral lobes linear-subulate, 9 – 12 × 1.2 – 1.5 mm, black along midrib, pubescent with ascending long bristly hairs. *Corolla* blue or pale lilac-blue, (35 –) 40 – 45 mm long; tube infundibuliform, 21 – 23 mm long, narrow proximal portion 9 – 10 mm long, ± 3 mm diam. at extreme base, glabrous, distal enlarged portion 12 – 13 mm long, 10 – 11 mm diam. at mouth, this and lobes pubescent externally with glandular and eglandular hairs; limb in “4+1” configuration, abaxial lobe offset by 10 – 11 mm, obovate, 16 – 18 × 19 – 21 mm (c. 6 mm wide at base), apex emarginate; lateral and adaxial lobes subequal 12 – 14 × 10 – 15 mm (4 – 7 mm wide at base). *Stamens* 2, inserted ± 10 mm above base of corolla tube; filaments 24 – 25 mm long, pubescent at base with glandular and eglandular hairs; anthers ± 3 mm long; staminodes 3,

Table 1. Comparison of the main diagnostic characters separating *Barleria ensermui* from allied species.

Character	<i>B. ensermui</i>	<i>B. mucronifolia</i>	<i>B. steudneri</i>	<i>B. delamerei</i>
Inflorescence	2 – 6-flowered contracted unilateral cyme	(1 –) 3 – 15-flowered contracted unilateral cyme	Several – many-flowered contracted unilateral cymes	Flowers solitary
Bracteoles: shape and width (longer of each pair, excluding basal-most pair)	Lanceolate with base abruptly widened and ± rounded; 4.5 – 9 mm wide excluding lateral spines	(Ovate-) lanceolate with base usually rounded or obtuse; 1.5 – 8.5 mm wide excluding (if present) lateral spines	Ovate to oblong-lanceolate, 7.5 – 16 mm wide	Linear or narrowly lanceolate, base cuneate; 0.7 – 2 (– 3) mm wide excluding harsh lateral spines
Posterior calyx lobe: shape and width	(Oblong-) elliptic or obovate, base cuneate or attenuate; 4.5 – 11.5 mm wide	Broadly ovate, base cordate; 9 – 17 mm wide	Ovate to elliptic, 12 – 17 mm wide	Lanceolate, oblong or elliptic, base cuneate; 2 – 6 mm wide
Posterior calyx lobe: margin	With 2 or 3 prominent spines along each margin in distal half	Subentire or if spines present then those in proximal half are submarginal	Laciniate and with ± dense bristly hairs	With 2 – 9 spines along each margin (plants with elliptic calyces usually have more than 4 spines per margin)
Corolla tube	24 – 25 mm long, funnel-shaped above insertion point of stamens	33 – 40 mm long, cylindrical for most of length, shortly funnel-shaped at mouth only	25 – 34 mm long, narrowly funnel-shaped above insertion point of stamens	18 – 27 mm long, funnel-shaped above insertion point of stamens
Corolla lobes	11 – 14.5 mm long, divergent at anthesis	7 – 11 mm long, not widely divergent at anthesis	13 – 19 mm long, divergent at anthesis	8.5 – 13.5 mm long, divergent at anthesis
Staminal filament length (mm)	21 – 23	15 – 21	12 – 18	10 – 22
Anther length (mm)	2.2 – 2.5	2 – 2.8	3 – 3.8	2 – 2.5

filaments \pm 3 mm long, pilose with eglandular hairs; antherodes of lateral staminodes \pm 1 mm long, adaxial staminode without antherode. *Ovary* \pm 3 mm long, surrounded by disc for up to half its length, glabrous; style \pm 35 mm long, glabrous; stigma clavate to subcapitate, 0.6 – 0.8 mm long. *Capsule* (obovate-) elliptic in face view, 12 – 15 \times 6 – 8 mm, shining black, glabrous, 2-seeded; seeds 6 – 7 \times 5 – 6 mm, face sub-ovate, with dark golden-yellow to brown hygroscopic hairs in dry state, shining. Figs 3 & 4.

RECOGNITION. *Barleria baluganii* is closely related to *B. ventricosa* Hochst. ex Nees and allies. It differs from *B. ventricosa sensu stricto* and *B. vix-dentata* C. B. Clarke (sometimes treated as a form of *B. ventricosa*) in that it dries dark green or green-brown with often blackish stems (vs usually drying bright green or greyish-green); in the vegetative parts being near-glabrous (vs conspicuously hairy); in usually having long-acuminate leaves (vs leaves acute, attenuate or at most shortly acuminate), in the individual cymes of the thyse having 3 – 7 or more flowers (vs 1 – 3 flowers), and in the indumentum on the external calyx surface being sparser and more appressed. The “*keniensis*” form of *B. ventricosa* often dries blackish and can have more markedly acuminate leaves and more than 3 flowers per cyme as in *B. baluganii*, but the new species differs in being less hairy throughout and in particular lacking the dense silky indumentum of the calyces, bracts and young shoots, and in having more unequal anterior and posterior calyx lobes.

DISTRIBUTION. *Baleria baluganii* occurs in the Welega, Ilubabor and Kefa Floristic Regions of southwestern Ethiopia. Map 1, black circles.

SPECIMENS STUDIED. **ETHIOPIA.** Welega Region: Anfilo, near Dambidolla, 6300 ft [1920 m], fl. & fr. 3 March 1957, *Mooney* 6873 (ETH, K); about 15 km E of Nekemte, 9°05'N, 36°35'E, 1910 m, 23 Oct. 1980, *Ensermu K. & Tamrat B.* 454 (ETH); Kelem Awraja, c. 13 km S of Dembidollo on the way to Gambella, 1900 m, fl. 18 Nov. 1981, *Mesfin T. & Kagneu G. Y.* 2347 (ETH holotype; ETH, K isotypes); 78 km from Gimbi to Dembidollo, 1700 m, fl. 27 Oct. 1985, *Sebsebe D. & Ensermu K.* 1580 (ETH). Ilubabor Region: around Gumuro tea plantation, 1750 m, fl. & fr. 9 Jan. 1978, *Mesfin T. & Sebsebe D.* 194 (ETH); Gore Awraia, at/between Gumaro R. and Gumaro Tea Plantation, 8°09'N, 35°28'E, 1700 – 1730 m, fl. 12 Aug. 1982, *Puff & Ensermu K.* 820812-4/3. (ETH, WU). Kefa Region: Jimma, fl. Oct. 1954, *Mooney* 5929 (ETH, K); Jimma, fl. 11 Sept. 1958, *Siegenthalier* X-52 (K); E side of Bellete Forest, 6800 ft [2070 m], fl. 9 Sept. 1962, *Palmer* 63A (K); 49 km N of Jimma, via Agaro road, turning right at Ghembi village, thence NW c. 8 km, 7°57'N, 36°48'E, 1610 m, fl. 24 Nov. 1964, *Meyer* 8824 (K); about 10 km E of Jimma, 2000 m, fl. 12 Aug. 1965, *de Wilde & de Wilde-Duyffes* 7627 (ETH, K, WAG); between

Fig. 3. *Barleria baluganii*. A habit, flowering branch; B calyx, anterior lobe folded down; C dissected corolla with stamens and staminodes; D detail of staminodes; E fertile stamens; F gynoeceum with disc; G detail of stigma with uppermost portion of style; H capsule within persistent calyx, dehiscent; J seed. A – G from *Mesfin T. & Kagneu* 2347, H & J from *Mooney* 6873. DRAWN BY LINDA GURR.

Wush-Wush and Buba, c. 20 km NW of Bonga, c. 1800 m, fl. 17 Aug. 1965, *de Wilde & de Wilde-Duyffes* 7779 (ETH, K, WAG); Bellete Forest, c. 40 km SW of Jimma, on Bonga road, 7°35'N, 36°38'E, 2000 m, fl. 10 Nov. 1970, *Friis, Hounde A. & Jacobsen* 237 (C, ETH, K); Bonga, behind the Catholic Mission, 7°15'N, 36°13'E, 1700 m, fl. 6 Jan. 1973, *Friis et al.* 2091 (C, ETH, K); 65 km W of Bonga along road to Shewa Gimira, 7°15'N, 35°55'E, 1600 m, fl. 11 Jan. 1973, *Friis et al.* 2199 (C, ETH, K); Kefa Awraja, Bonga area, 7°15'N, 36°15'E, 1700 – 1800 m, fl. 16 Aug. 1982, *Puff & Ensermu K.* 820816-3/4 (ETH, K, WU); Jimma Awraja, E end of Bellete Forest, 7°35'N, 36°40'E, 2170 m, fl. 18 Aug. 1982, *Puff & Ensermu K.* 820818-7/3 (ETH, K, WU); Bebeke Coffee Plantation, S of Mizan Teferi, 5 km NE of the Coffee Plantation H.Q., 6°54'N, 35°27'E, 1150 m, fl. & fr. 3 Nov. 1984, *Friis, Gilbert & Vollesen* 3971 (C, ETH, K); 40 km to SW from Jima, on the way to Gojeb, near Forest Station, 2100 m, fl. 20 April 1997, *Pavlov* 97-142 (ETH); SW of Jimma on main road 10 km before Bonga, 7°17'N, 36°17'E, fl. 16 Sept. 2003, *Brummitt* 20929 (K); Bonga, near Barta Waterfall just outside of town, 1870 m, fl. 10 April 2010, *Tripp* [with *Ensermu K.*] 915 (ETH, RSA).

HABITAT & ECOLOGY. *Barleria baluganii* occurs in areas of moist forest of e.g. *Pouteria*, *Albizia*, *Olea*, *Schefflera* and *Dracaena*, sometimes with *Croton macrostachyus* Delile and *Cordia africana* Lam. It typically occurs in dense thickets along forest streams, margins, clearings or in disturbed secondary growth where it can clamber over and within other bushes and small trees. It can also occur in coffee plantations where the coffee is shade-cropped within semi-natural forest, where it can be found clambering over *Coffea arabica* L. It occurs at (1100 –) 1600 – 2200 m altitude.

CONSERVATION STATUS. This species occurs only in the upland forest zone of western Ethiopia between Gambela and Jimma west to east and between Nekemte and Mizan Teferi north to south. It has an EOO of 39,934 km² and an AOO of 80 km², applying the standard 2 \times 2 km grid cell size recommended for AOO calculation (IUCN Standards and Petitions Subcommittee 2017). It can be locally common in suitable habitat. However, these forests are under increasing threat from a range of pressures including expanding plantation agriculture, exotic tree forestry and timber extraction (BirdLife International 2017a & b; Sebsebe Demissew, pers. comm.). Several historical

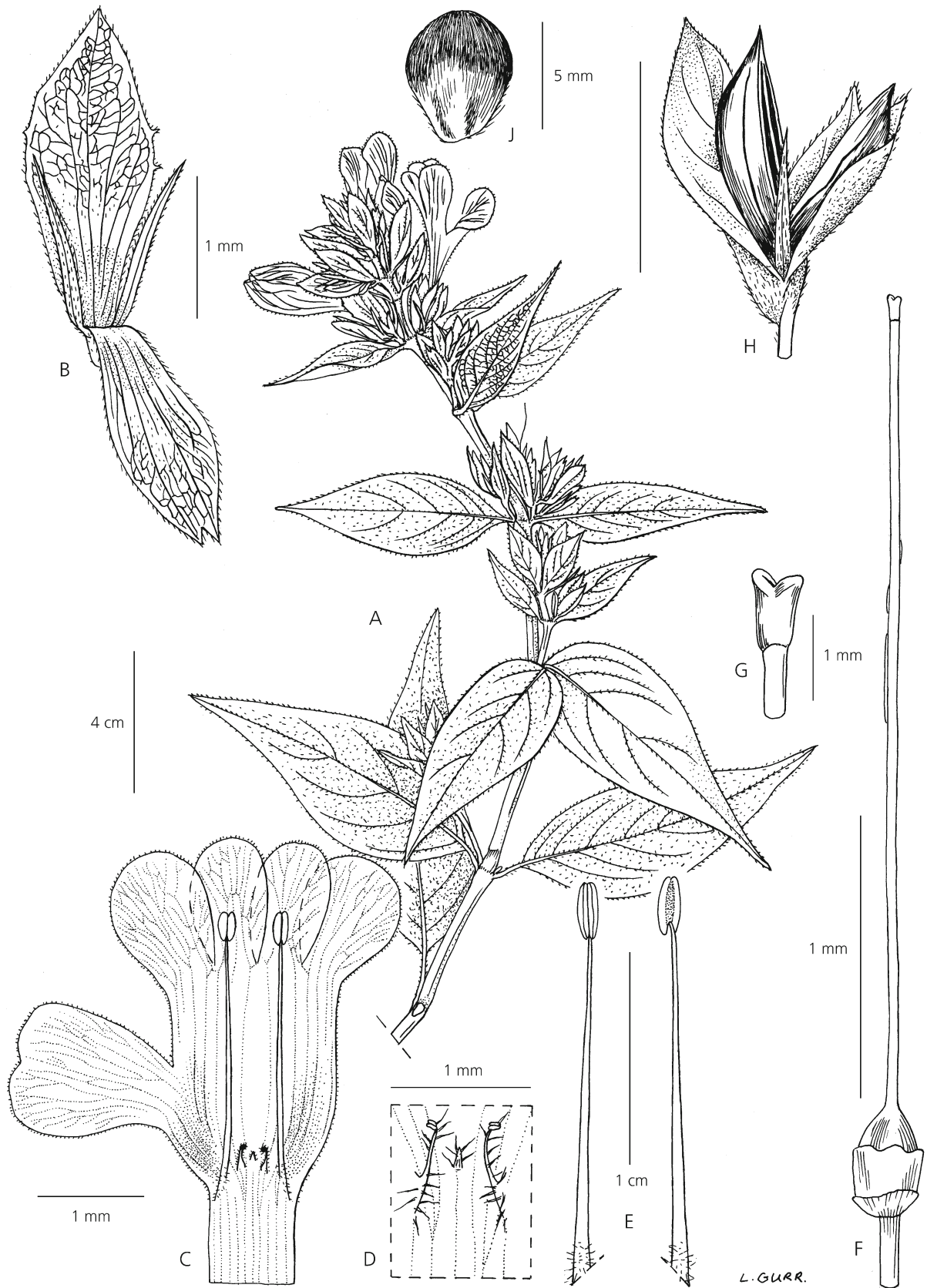




Fig. 4. *Barleria baluganii* photographed near Barta Waterfall, Ethiopia, 10th April 2017. PHOTO: E. A. TRIPP.

sites for this species now appear, from Google Earth imagery, to have little or no forest remaining. It is therefore possible that this species would qualify as threatened under IUCN criterion A, but for a full assessment, the generation length and rates of decline would need to be better understood. In the absence of such information, this species is considered to be **Near Threatened (NT)** as it is close to qualifying as Vulnerable under IUCN criterion B2 but with more than 10 locations currently known.

ETYMOLOGY. The species epithet was proposed by Ensermu (pers. comm.) to commemorate Luigi Balugani (1737 – 1770), Italian artist from Bologna, who served as an assistant and artist to the Scottish explorer James Bruce during their journey in Ethiopia in 1769 – 1770, during which Balugani was the first to study the Ethiopian flora and make meticulous drawings and observations according to contemporary scientific ideas.

NOTES. With the combination of 2-seeded capsule lacking a prominent beak, simple indumentum, lack of spines and infundibuliform corolla with “4+1” limb configuration, this species would previously have been placed within *Barleria* sect. *Fissimura* M. Balkwill (Balkwill & Balkwill 1997; Darbyshire 2009). However, recent molecular evidence (Fisher *et al.*, unpubl. data) indicates that sect. *Fissimura* is nested within sect. *Barleria* and so cannot be upheld. *B. baluganii* is allied to the *B. ventricosa* Nees complex; this group was treated as an aggregate species with only informally recognised taxa in *Flora of Tropical East Africa* (Darbyshire 2010 — see discussion on p. 363) whereas in FEE the taxa were maintained as good species (Ensermu 2006). It is on the latter basis that *B. baluganii* is recognised as a distinct species, and this is well justified by the fact that the different entities are clearly discrete in Ethiopia. Indeed, *B. baluganii* is quite distinctive in general gestalt, and can be separated from all forms of *B. ventricosa sensu lato* when the combination of the following characters is observed: the largely glabrous vegetative parts that dry dark green to green-brown (stems often drying black), the \pm long-acuminate leaves, the well-developed terminal thyrse with cymes often more than 3-flowered, and the rather sparse appressed calyx indumentum. It should be noted, however, that none of these characters are wholly diagnostic when taken in isolation. A detailed molecular study is required on the *B. ventricosa* complex to assist with species delimitation, but *B. baluganii* appears to be sufficiently distinct morphologically to warrant recognition at this stage.

The only other potential confusion species is *Barleria brownii* S. Moore which also occurs in the forests of Kefa region, although at slightly lower altitudes (\pm 1050 m), and shares with *B. baluganii* an interrupted terminal thyrse. However, *B. brownii* is unmistakable in flower, having extremely long-

exserted stamens and stigmas, the staminal filaments being 34 – 65 mm long and the style similarly long.

Barleria baluganii is one of several forest acanths restricted to the moist forests of western and southern Ethiopia; other examples include *Brillantaisia grotanellii* Pic. Serm., *Justicia bizuneshiae* Ensermu and the recently described *Acanthopale aethio-germanica* Ensermu (Ensermu 2006, 2009).

***Barleria ferox* Ensermu & I. Darbysh. sp. nov.** Type: Ethiopia, Harerge Region, near Galacia, 10 Nov. 1963, Burger 3349 (holotype ETH; isotypes FT, K).

<http://www.ipni.org/urn:lsid:ipni.org:names:77167080-1>

Barleria sp. (= *Amare* G. D-10) sensu Ensermu (2006: 415).

Harshly spiny shrub up to 0.3 – 1 m high; much-branched; stems at first 4-angular and -ridged, later becoming more convex between the ridges, mature stems stout, to 5 – 9 mm diam., internodes mostly short with crowded nodes, internodes of leafy stems up to 30 mm long; young stems puberulous in two opposite bands in shallow channels between the ridges, shortly strigulose around the nodes and along the nodal line. *Axillary spines* white-grey, stout, stalk (4 –) 8 – 16 mm long; 4-rayed, longest rays typically 22 – 32 mm long, straight and widely divergent. *Leaves* on petiole up to 5 mm long; blade somewhat coriaceous, oblong-elliptic or -obovate, 27 – 48 \times 13 – 25 mm, conduplicate in dry state, base cuneate, margin entire, apex mucronate with 2 – 3 mm long spine, sparsely strigulose along main veins beneath, margin and midrib above, also with \pm numerous broad sessile glands towards base beneath; lateral veins indistinct, 4 – 6 pairs. *Inflorescences* terminal, spiciform or conical in outline, with a series of decussately arranged cymes, often 3-flowered but those towards apex of inflorescence 1-flowered, cymes at base of inflorescence can have 7 or more flowers, dichasial, lateral branches partially fused to subtending bracteoles; bracts leafy but reducing in size and width up the axis, elliptic to obovate-elliptic or narrowly so, typically 18 – 30 \times 3.5 – 13 mm, apex long-spinose, abaxial surface with numerous broad sessile glands towards base; bracteoles linear-lanceolate, varying considerably in size, typically 10 – 17.5 \times 1.5 – 3 mm, but with those subtending first flower of dichasial cymes up to 24 – 29 mm long, those of cymes towards apex of inflorescence can be much-reduced, then 5 \times 0.5 mm or less, well-developed bracteoles with apex long-spinose, midrib prominent, abaxial surface with numerous broad sessile glands towards base. *Calyx* at first drying brown with thin margins, these thickening and becoming white at fruiting stage, anterior and posterior lobes broadly ovate 2.7 – 3 \times 2 – 3 mm in flower

excluding linear apical seta 1.5 – 2.5 mm long, this rarely bifid on anterior lobe, somewhat larger in fruiting stage where outer lobes up to 4.3×4 mm excluding setae, external surface with scattered to numerous broad sessile glands, basal tubular portion often puberulent; lateral lobes lanceolate, more gradually narrowed into apical seta, $4 - 6 \times 1 - 2$ mm. *Corolla* 25 – 33 mm long, lilac- to blue-purple, glabrous externally; tube subcylindrical, 12 – 14 mm long, $\pm 2.5 - 3$ mm diam. at base, $\pm 3.5 - 4$ mm at mouth; limb 5-lobed in a weak “4+1” configuration, abaxial lobe offset by ± 2.5 mm, all lobes obovate, $13 - 15 \times 8 - 11$ mm, rounded at apices, adaxial pair of lobes somewhat narrower than lateral and abaxial lobes. *Stamens* inserted $\pm 5 - 6.5$ mm above base of corolla tube; filaments $\pm 20 - 25$ mm long, sparsely pubescent proximally; anthers $3 - 3.5$ mm long; lateral staminodes with filaments $\pm 2 - 2.7$ mm long, pubescent, antherodes well-developed, 2-theous, to 1 mm long. *Ovary* 4 – 4.5 mm long, glabrous; style 18 – 22 mm long, glabrous; stigma linear, 0.8 – 1 mm long. *Capsule* only seen in immature state, 2-seeded, ± 10 mm long including prominent conical beak, glabrous. Fig. 5.

RECOGNITION. *Barleria ferox* is morphologically closest to *B. quadrispina*, sharing with that species the combination of rayed axillary spines and blue or purple corollas arranged in decussate, dichasial cymes. It clearly differs in (1) having very stout axillary spines which are stalked for (4 –) 8 – 16 mm and have widely divergent rays (vs in *B. quadrispina* axillary spines slender and needle-like, often subsessile or stalked for less than 5 mm, or if rarely stalked up to 12 mm then the rays ascending, much less divergent); (2) in having numerous and conspicuous broad sessile glands towards the base of the bracts and bracteoles and on the outer calyx lobes (these absent or sparse and inconspicuous in *B. quadrispina*) and (3) in the calyces being markedly shorter and broader, the lobes 4 – 6 mm long, the anterior and posterior lobes being broadly ovate and abruptly narrowed into a short linear seta (vs at least the posterior lobes markedly longer, 6.5 – 17 mm long and usually over 10 mm long, basal portion not so broadly ovate and less abruptly narrowed into a long flexible apical seta). In addition, *B. quadrispina* is a less robust plant than *B. ferox*, and it usually has a conspicuously hairy inflorescence, with appressed to ascending, often bulbous-based bristly eglandular hairs and often also spreading slender glandular hairs which are absent in *B. ferox*. See Table 2.

DISTRIBUTION. *Barleria ferox* is distributed in eastern Ethiopia in Harerge Floristic Region. Map 1, black stars.

SPECIMENS STUDIED. ETHIOPIA. Harerge region: Jijiga Road, 15 Sept. 1958, *Amare* G. D-10 (EA, K); 90 km S of

Harar on road S of Midaga, 14 Oct. 1962, *Burger* 2190 (ETH, K); near Galalacia, $8^{\circ} 2'N$, $42^{\circ} 41'E$, 10 Nov. 1963, *Burger* 3349 (ETH holotype; FT, K isotypes).

HABITAT & ECOLOGY. There is only very limited information on the ecology of *Barleria ferox*; on the type specimen it was recorded from open limestone slopes with shrubs and no trees, whilst Amare Getahun recorded it from a “dry area”; it occurs at c. 1400 – 1600 m elevation.

CONSERVATION STATUS. This species is currently known from a very small range south of Harar and Jijiga in eastern Ethiopia, with three locations known and an EOO of 1348 km², which falls within the Endangered range threshold for IUCN Criterion B1. It is clearly uncommon in view of the fact that it has not been collected for over half a century despite being a robust plant with showy flowers. Google Earth imagery shows that there is some fairly intensive agriculture in the region, particularly south of Midaga. It is considered likely that this has impacted on this species’ habitat leading to some population decline. This species is therefore provisionally assessed as **Endangered EN B1ab(iii)**. However, it should be noted that parts of its range have not been intensively botanised and so it may prove to be more frequent within its small range than is currently known. Dedicated field surveys to rediscover this species and review its current status and population size are highly desirable.

ETYMOLOGY. The epithet “*ferox*”, meaning “fierce”, refers to the harshly spiny nature of this species.

NOTES. The combination of rayed axillary spines, an androecium comprising two perfected stamens and two lateral staminodes with well-developed antherodes, and a prominently beaked, 2-seeded capsule clearly place this species in *Barleria* sect. *Prionitis* (Oerst.) Nees (Balkwill & Balkwill 1997; Darbyshire 2009). Blue to purple flowers are unusual in sect. *Prionitis*, where the flowers are typically yellow, orange, ochre-coloured, red or white. However, *B. quadrispina* Lindau, a widespread species in the drylands of the Horn of Africa, also has blue or purple (or white) corollas and *B. ferox* is undoubtedly close to that species, also sharing a similar inflorescence form in which at least some of the partial inflorescences are dichasial cymes with the lateral branches partially fused to the subtending bracteoles. Whilst *B. quadrispina* is quite a variable species, *B. ferox* is always easily separated from it by the characters listed in the Recognition section. The two are compared in Table 2, together with a third blue-flowered species, *B. negeleensis* which is described below.

The general habit including the harsh spines and the short, broadly ovate calyces in *Barleria ferox* are somewhat reminiscent of *B. trispinosa* (Forssk.) Vahl which occurs in northern Ethiopia, but that species is easily separated by its large yellow, orange or white corollas 40 – 60 mm long with a marked “4+1”

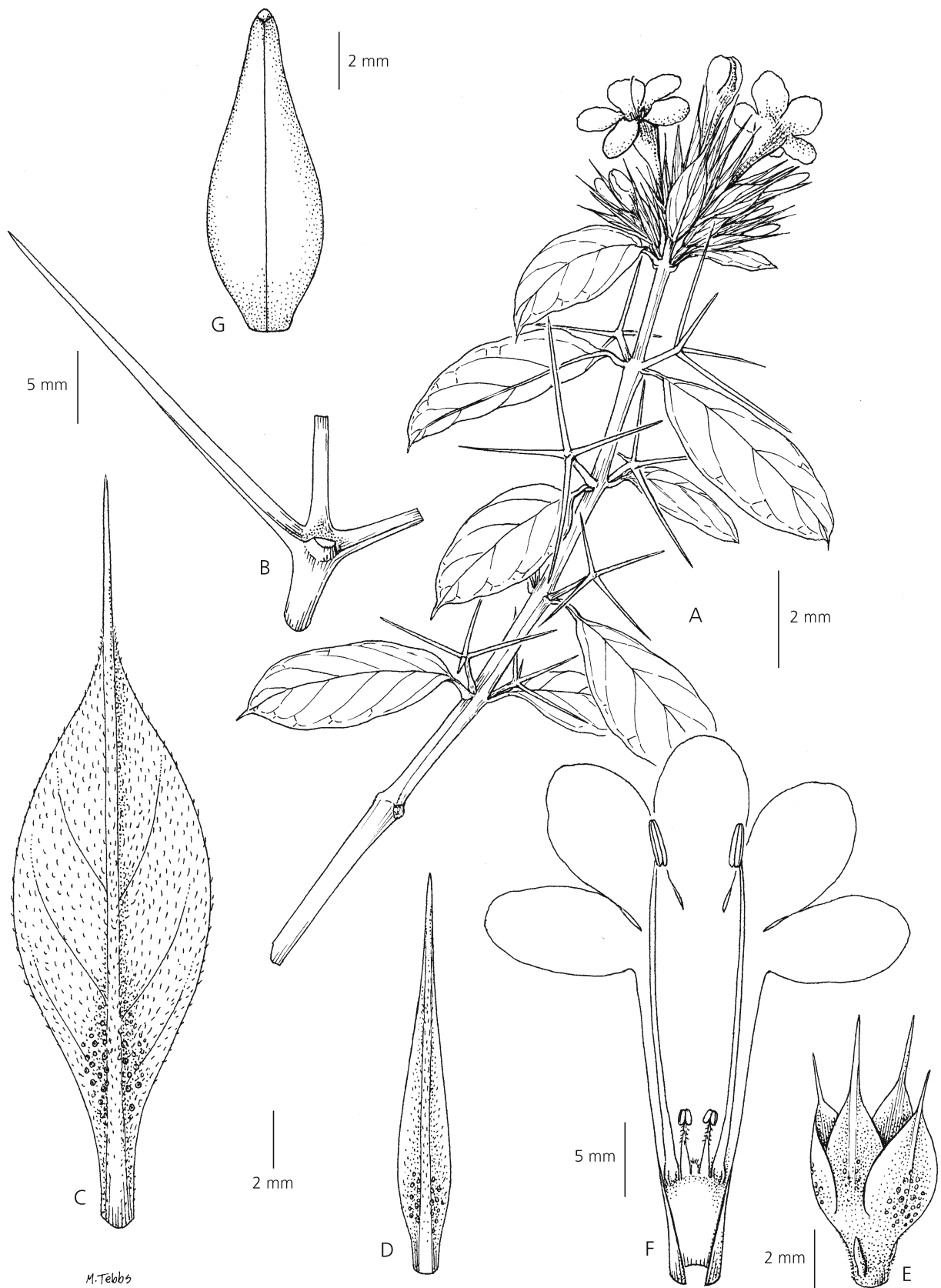


Fig. 5. *Barleria ferox*. **A** habit, fertile branch; **B** detail of axillary spine, 3 branches cut; **C** bract, external surface; **D** bracteole, external surface; **E** calyx; **F** dissected corolla with androecium; **G** immature capsule. **A** – **F** from *Burger* 3349; **G** from *Burger* 2190. DRAWN BY MARGARET TEBBS.

Table 2. Comparison of the main diagnostic characters separating *Barleria ferox*, *B. quadrispina* and *B. negeleensis*. Note that only immature capsules have been seen for *B. ferox*.

Character	<i>B. ferox</i>	<i>B. quadrispina</i>	<i>B. negeleensis</i>
Rayed spines: stalk	Stout, (4 –) 8 – 16 mm long	Often subsessile, if stalk present then slender, to 12 mm long	(If spines present) slender, 0 – 12 mm long
Rayed spines: rays	Stout, widely divergent, longest ray 22 – 32 mm	Slender, often ascending, longest ray 10 – 29 mm	Slender, erect to divergent, longest ray 10 – 30 mm
Leaf shape and base	Oblong-elliptic or -obovate, base cuneate, shortly petiolate	Oblanceolate, obovate or oblong-elliptic; base cuneate or attenuate, shortly petiolate or if sessile then not sheathing	Linear-oblong to narrowly oblong-elliptic, base sessile and shortly sheathing the stem
Bract apex	Apex with a long ± stout spine	Apex with a short slender spine	Apex with a long stout spine
Sessile cupular glands on bracteoles and calyces	Numerous, conspicuous	Absent or sparse and inconspicuous	Absent
Anterior and posterior calyx lobe shape and dimensions (flowering stage)	Broadly ovate with a short linear apical seta, 4 – 5.5 × 2 – 3 mm including seta	Lanceolate or ovate, ± abruptly narrowing into flexuose apical spine, (5.5 –) 10 – 17 × 1.5 – 3 (– 4) mm	Lanceolate, gradually (sub) attenuate into apical spine (11 –) 14 – 17 × 4 – 6 mm
Capsule length	± 10 mm (only seen in immature state)	9 – 11 mm	13.5 – 16 mm
Seed width (face view)	Unknown	2.5 – 4 mm	± 6.5 mm

configuration, the abaxial lobe being offset from the remaining lobes by over 10 mm, and in the partial inflorescences being single-flowered.

Barleria negeleensis Ensermu & I. Darbysh. **sp. nov.**
Type: Ethiopia, Sidamo Region, Borana, 31 km from Negele towards Filtu, 14 Dec. 1990, *Sebsebe D.* & *Ensermu K.* 2658 (holotype ETH; isotype K).

<http://www.ipni.org/urn:lsid:ipni.org:names:77167081-1>

Barleria sp. (= *Sebsebe D.* & *Ensermu K.* 2658) sensu Ensermu (2006: 416).

Spiny perennial herb, stems up to 40 cm long, creeping for most of their length but fertile portions decumbent, woody at base, mature stems stout, 4.5 – 7 mm diam., bluntly 4-angular and with 4 ridges, bearing prominent scars from leaf bases; young stems pubescent with long ascending bristly hairs or sparsely so, mature stems can be glabrescent; internodes variable, up to 3 – 4 cm long but can be very short or largely absent in some parts of the stems. *Axillary spines* present or absent, can be partially hidden by sheathing leaf base, pale grey, slender, stalk 0 – 12 mm long, usually 4-rayed (but those in distal leaf axils can be ± sessile and 2-rayed, resembling bracteoles), rays erect to spreading; longest rays 10 – 30 mm long, glabrous or sparsely glandular-pubescent. *Leaves* sessile with base shortly sheathing stem; blade typically drying yellowish-green, linear-oblong to narrowly oblong-elliptic, 5 – 14 × 1 – 2.7 cm, base cuneate, margin

entire, apex acute or obtuse and with sharp spine 1 – 3 mm long on cauline leaves or up to 8 mm long on leaves subtending inflorescences (these transitional to bracts), surfaces pubescent with bristly ascending hairs at least along margin, sometimes dense on margin, midrib and on main veins beneath; cystoliths very numerous and conspicuous; lateral veins 4 – 5 pairs, these and midrib typically dry yellow, prominent beneath. *Inflorescences* terminal, densely spiciform with imbricate bracts, conical or subcapitate in outline, 3.5 – 11 cm long, with a series of decussately arranged dichasial cymes 3 – several-flowered, lateral branches partially fused to subtending bracteoles; bracts pale green or distal portion purple-tinged, bracts towards base of spike ovate to oblong-elliptic, 22 – 40 × 8.5 – 17 mm including prominent grey apical spine 4 – 8 mm long; bracts towards apex of inflorescence becoming oblanceolate, then (14 –) 18 – 31 × (4 –) 5.5 – 7.5 mm, bracts at first ± densely pubescent with ascending bristly eglandular hairs and long patent glandular hairs, but becoming glabrescent at fruiting stage; bracteoles variable, those of first flower in dichasium lanceolate to oblanceolate and can resemble the bracts, 15 – 32 × (2 –) 4 – 7.5 mm, those of lateral flowers in dichasium more linear-lanceolate, (8 –) 14 – 20 × 1 – 2.5 mm, apex spinose, colour and indumentum as bracts. *Calyx* straw-coloured, anterior and posterior lobes sub-equal, lanceolate, (11 –) 14 – 17 × 4 – 6 mm, apex (sub)attenuate into a spine, external surface densely pubescent with long bristly ascending or appressed eglandular hairs and long patent glandular hairs, becoming more sparse at fruiting; lateral lobes linear-lanceolate, 11 – 15 × 1 –

1.8 mm. *Corolla* pale blue to purple, glabrous externally; tube \pm cylindrical 15 – 16 mm long, slightly swollen at the base where \pm 3 mm diam., mouth \pm 2.5 mm diam.; limb in weak “4+1” configuration, abaxial lobe offset by \pm 2.5 mm, lobes sub-equal, obovate, 14.5 – 21 mm long, abaxial and lateral lobes 10 – 14 mm wide, lateral lobes somewhat narrower, apices rounded. *Stamens* inserted \pm 5 – 6 mm above base of corolla tube, exerted from tube for \pm 12 mm; filaments 17 – 21 mm long, shortly pubescent with blunt hairs; anthers 2.5 – 3 mm long; lateral staminodes borne above insertion point of stamens; filaments 1.3 – 2 mm long, pubescent proximally; antherodes 0.7 – 0.8 mm long; adaxial staminode minute or absent. *Ovary* c. 3 mm long, glabrous; style 27 – 29 mm long, glabrous; stigma linear, 0.5 – 0.6 mm long. *Capsule* 13.5 – 16 \times 6 mm including short beak 3.5 – 4 mm long, glabrous; seeds \pm 8 \times 6.5 mm, with straight golden-brown hygroscopic hairs. Fig. 6.

RECOGNITION. *Barleria negeleensis* is allied to *B. quadrispina* but differs in (1) the shortly sheathing leaf base and the typically longer and proportionately narrower, linear-oblong to narrowly oblong-elliptic mature leaves (leaf base not sheathing in *B. quadrispina* and blade obovate, oblanceolate or oblong-elliptic); (2) the bracts of the inflorescence being imbricate at least in the lower portion of the spike and these largely or partially enclosing the cymes (vs bracts not imbricate and cymes usually clearly exposed); (3) the bracts having a stout terminal spine 4 – 8 mm long (vs bracts with short slender terminal spine); (4) the broader and more gradually narrowed anterior and posterior calyx lobes, 4 – 6 mm wide (vs anterior and posterior calyx lobes markedly acuminate and only 1.5 – 3 (– 4) mm wide at base), and (5) the larger capsules, 13.5 – 16 mm long with beak only c. $\frac{1}{4}$ the total length of the capsule and seeds c. 6.5 mm wide (vs capsule 9 – 11 mm long with beak c. $\frac{1}{3}$ the total length of the capsule and seeds c. 2.5 – 4 mm wide in *B. quadrispina*). See Table 2.

DISTRIBUTION. This species is restricted to the Bale and Sidamo Floristic Regions of southern Ethiopia. Map 1, black squares.

SPECIMENS STUDIED. ETHIOPIA. Bale Region: c. 52 km N of Sidambale Bridge towards Dolo Menna, 5°55'N, 39°37'E, 1650 m, 20 Dec. 2002, Friis *et al.* 11071 (C, K, ETH). Sidamo Region: near Wadera, 1700 m, 6 Jan. 1959, Mooney 7706 (EA, ETH, PRE); Borana Awraja, 42 km SW of Negele Borana, along the road leading to Wellensu [Wolensu] Ranch, 1440 m, 24 Dec. 1981, Mesfin T. & Tewolde B. G. E. 2636 (ETH); 31 km from Negele towards Filtu, 5°13'N, 39°47'E, 1640 m, 14 Dec. 1990, Sebsebe D. & Ensermu K. 2658 (ETH holotype, K isotype).

HABITAT & ECOLOGY. *Barleria negeleensis* occurs in open grassland and grassy-scrub with scattered *Acacia*,

Combretum, *Commiphora* and/or *Terminalia* or in more dense *Acacia-Commiphora* woodland with *Barbeya oleoides* Schweinf., in sandy soil overlying granite or on limestone. It occurs at 1400 – 1700 m elevation.

CONSERVATION STATUS. This species has a very small range mainly in the vicinity of Negele in southern Ethiopia. It has an EOO of 2117 km² which falls within the “Endangered” range threshold under IUCN criterion B1. It has been recorded as very local but common within an area of 400 m² at the type locality. In the documentation of the Liben Plains and Negele Woodlands Important Bird Area (BirdLife International 2017c), which includes the type locality for *B. negeleensis*, the threat pressure is recorded as high. This area is unprotected and is impacted by development of new settlements; there is also a potential threat from plans to develop a new airport for Negele in part of this area. Analysis of Google Earth imagery shows that there has been significant clearance for agriculture and settlement in the vicinity of Negele town and to the east covering an area of up to c. 250 km² (just over 10% of the total EOO). However, it should be noted that this species has not so far been collected in these most impacted areas. Further, this species' range has not been well botanised beyond the few main access roads and there is still extensive intact natural habitat within its EOO, although it is not clear as to how much of this is suitable for this species. In view of the limited information available to date, this species is considered to be **Data Deficient (DD)** but it may prove to be unthreatened as the threats within its range are quite localised.

ETYMOLOGY. *Barleria negeleensis* is named after the small town of Negele (Negele Borana or Neghelle), close to which three of the four known specimens of this species have been collected.

NOTES. This is a second species within sect. *Prionitis* allied to *Barleria quadrispina*. It is easily separated by the characters given in the Recognition section, and this species has a very distinctive general appearance quite unlike that of *B. quadrispina*. The two are compared, together with *B. ferox*, in Table 2.

The collection from Bale Region, Friis *et al.* 11071, is considered to be a depauperate specimen of this species, although it is noteworthy that the inflorescence is less densely hairy than in other flowering specimens, with shorter bristly eglandular hairs, and that the leaves dry a darker green tinged purple, whilst the Sidamo material has yellow-green leaves. More ample material from the Bale site is desirable; it may be a distinct regional form.

There are also a number of other potentially distinct taxa within the *Barleria quadrispina* complex in the Horn of Africa. Of particular note are robust shrubby or sometimes scandent plants from the Bale and Sidamo Floristic Regions of Ethiopia with large, broadly elliptic



Fig. 6. *Barleria negeleensis*. A habit, flowering branch with fallen corollas $\times 1$; B axillary spines $\times 1$; C leaf blade from distal portion of stem, abaxial surface $\times 1$; D cyme $\times 1$; E bract, external surface $\times 3$; F pair of bracteoles, external surfaces $\times 3$; G anterior (left) and posterior (right) calyx lobes $\times 3$; H lateral calyx lobes $\times 3$; J dissected corolla with androecium $\times 2$; K maturing gynoecium $\times 4$. A & D from Mooney 7706; B, C & E – J from Mesfin T. & Tewolde B. G. E. 2636. DRAWN BY SARAH HOWARD.

leaves up to 8 × 5 cm (*Bidgood et al.* 4961, *Friis et al.* 10949, 14746, *Gilbert et al.* 8257, *Gilbert & Sebsebe D.* 8628). This taxon was treated as a form of *B. quadrispina* in the *Flora of Ethiopia & Eritrea* (Ensermu 2006) but appears to be sufficiently distinct at least for infraspecific separation. Hedrén (2006a) also noted some distinct forms of this species in Somalia that may warrant distinction. A full revision of the *Barleria quadrispina* complex is required to fully delimit the taxa, but the two species described here are very clearly distinct.

***Barleria shebelleensis* Ensermu & I. Darbysh. sp. nov.**

Type: Somalia, Bulo Burte Distr., 2 km N of Bulo Burte, 9 Dec. 1987, *Kuchar* 17588 (holotype K sheet 1 — K000963626; isotype K sheet 2 — K000963627).

<http://www.ipni.org/urn:lsid:ipni.org:names:77167083-1>

Barleria hochstetteri sensu Hedrén (2006a: 435) pro parte, non Nees.

Barleria sp. (= *Kuchar* 16682) sensu Ensermu (2006: 403).

Woody-based perennial herb or shrublet; stems erect to trailing-decumbent, 5 – 40 (?– 100) cm high, much branched, 4-angular when mature with 4 narrow ± conspicuous furrows that have a more dense white indumentum than the rest of the stem, this pubescent with white appressed medifixed and retrorse hairs, often densely so, interspersed with some patent glandular hairs on distal internodes; internodes 3 – 6 cm long. *Leaves* subsessile, blade bluish-green, oblong-elliptic to oblong-lanceolate, 13 – 62 × 5 – 14 mm, base obtuse or rounded, margin entire, apex acute to rounded and mucronate, surfaces with appressed long medifixed hairs on both surfaces, distal leaves with spreading glandular hairs beneath towards the margins, young leaves can also be finely puberulent; lateral veins very faint, 3 – 4 pairs. *Inflorescences* axillary, cymes bearing 1 – 3 flowers; peduncle 1 – 4.5 mm long, hairs as stems; bracteoles foliaceous, oblong-elliptic or those of lateral flowers more oblanceolate, 8 22 × 2 – 9 mm, often oblique towards the mucronate apex, pubescent with medifixed hairs and patent glandular hairs, larger pairs tripliveined; pedicels 1.5 – 4.5 mm long. *Calyx* with lobes very unequal, anterior lobe linear-lanceolate, 4.5 – 8.7 × 1 – 1.5 mm, widest at base, apex entire or sometimes bifid; posterior lobe much larger, oblong-oblanceolate, 9 – 15.5 × 1.5 – 3.3 mm, widest in distal third, apex acute or attenuate; both lobes with short spreading glandular hairs and long appressed anvil-shaped biramous hairs, or these simple along lobe margins, surfaces can also be white eglandular-puberulous; lateral lobes linear-lanceolate, 4 – 6 × 0.7 – 1 mm. *Corolla* white, with (or ?without) pink streaks in the throat, 18 – 27 mm long, eglandular-puberulous

externally on distal portion of tube and on limb with or without few interspersed glandular hairs; tube 11.5 – 15.5 mm long, proximal portion ± 1.5 – 2 mm wide, throat gradually funnel-shaped, to 3.7 – 5.5 mm wide at mouth; limb in “4+1” configuration; abaxial lobe offset by 1.8 – 3.3 mm, broadly obovate, 5.5 – 10.5 × 4.7 – 8.8 mm, apex rounded or truncate; lateral lobes obovate-orbicular, 4 – 8.5 × 3.5 – 7.5 mm, apices rounded, adaxial lobes obovate or obovate-elliptic, 3.5 – 7.5 × 2.8 – 5.5 mm. *Stamens* inserted 3 – 5.5 mm above base of corolla tube, filaments 8 – 16 mm long, glabrous; anthers 1.8 – 2.8 mm long; staminodes 3, lateral staminodes 0.3 – 1 mm long, antherodes lacking. *Ovary* ± 2.5 mm long, puberulous with ascending hairs; style 14 – 16 mm long, glabrous or pubescent at base; stigma linear, 1 – 1.2 mm long. *Capsule* 8.5 – 11.5 × 3.5 – 4 mm, eglandular-puberulous; seeds 3 – 4 × 2.6 – 3.8 mm, ovate in face view, covered with curled cream-coloured hygroscopic hairs. Fig. 7.

RECOGNITION. *Barleria shebelleensis* falls within the *B. argentea* Balf. f. – *B. parviflora* T. Anderson complex but is easily separated from all other species in that group by having markedly dimorphic outer calyx lobes, the anterior lobe being linear-lanceolate and only marginally larger and wider than the lateral lobes whilst the posterior lobe is considerably larger (often twice as long) and oblong-oblanceolate in shape. The markedly 4-angular stems with ± conspicuous furrows at each angle also separate this species from its closest allies. *B. shebelleensis* is morphologically most similar to *B. parviflora* T. Anderson from which it differs in having 1 – 3-flowered cymes (flowers always solitary in *B. parviflora*) with a ± well-developed pedicel 1.5 – 4.5 mm long and bracteoles that are foliaceous and ± markedly larger than the calyx lobes and dissimilar in shape (in *B. parviflora* the flowers are sessile, immediately subtended by the bracteoles which are held erect, partially enveloping the calyx and ± closely resembling the outer calyx lobes in shape and size), and a puberulous ovary and capsule (glabrous in *B. parviflora*). Further, the peduncle of *B. parviflora* is often much longer than in *B. shebelleensis*, typically 5 – 20 (– 25) mm long, and the outer calyx lobes of *B. parviflora* are not dimorphic, both being ovate to oblong-lanceolate.

Barleria shebelleensis has previously been included within *B. hochstetteri* Nees with which it is vegetatively similar but it is easily separated from that species by the very different calyx, the outer lobes both being ovate to oblong-lanceolate in *B. hochstetteri*; the more contracted inflorescences, *B. hochstetteri* having peduncles 8 – 25 (– 38) mm long and pedicels 5 – 15 (– 27) mm long; and the less markedly zygomorphic corolla with the abaxial lobe only being offset by up to 3.3 mm (vs 4.5 – 7 mm in *B. hochstetteri*).

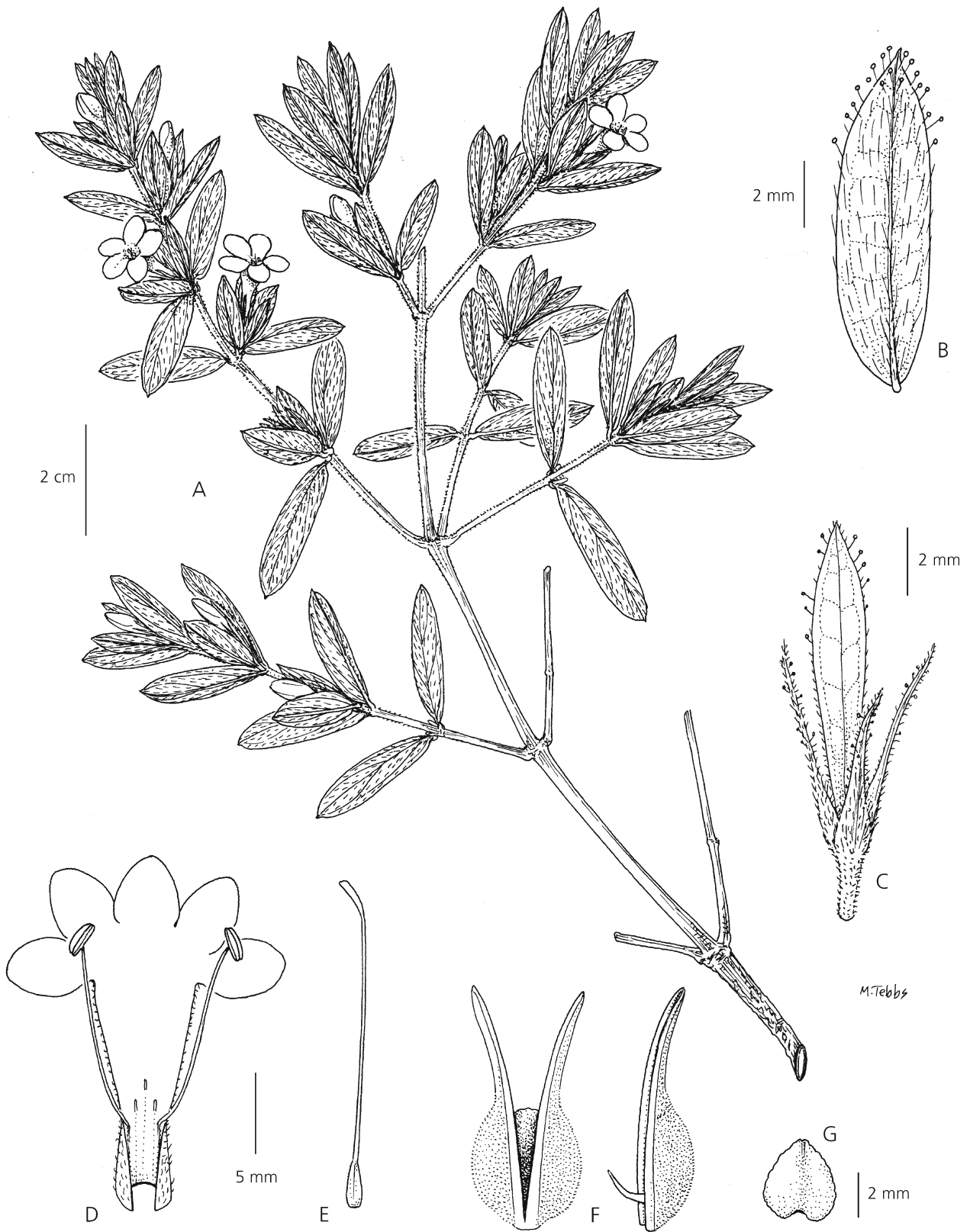


Fig. 7. *Barleria shebelleensis*. A habit, flowering branch; B bracteole, external surface; C calyx; D dissected corolla with androecium; E gynoecium; F capsule with seeds, and single capsule valve; G seed. A – C & E – G from Kuchar 17588; D from Kuchar 17046. DRAWN BY MARGARET TEBBS.

DISTRIBUTION. *Barleria shebelleensis* is restricted to central and southern Somalia (*Flora of Somalia* regions C2, S2 and S3), along the lower catchment of the Shebelle River. It may also occur along the southeastern Ethiopian portion of that river which forms the border between Harar and Bale Floristic regions. Map 1, red circles.

COLLECTIONS STUDIED. **SOMALIA.** Janaale area, flood plain of the Shabeelle R., between 1°30' and 2°00'N, fl. & fr. 2 – 3 Jan. 1978, *Virgo* 40 (K); Hiiraan Region, Bulu Burte Distr., 11 km NNW of Bulu Burte, fl. & fr. 4 Dec. 1984, *Kuchar* 16682 (K); Bulu Burte Distr., 25 km W from Bulu Burte on road to Mukayle, 3°48'N 45°21'E, fl. & fr. 1 July 1986, *Kuchar* 17046 (K); Shabeellaha Hoose Region, c. 45 km SW of Afgooye [Afgoi] along the main road to Shalaanbood [Shalambod], 1°48'N 44°44'E, fl. 29 May 1987, *Alstrup & Michelsen* 66 (K); Jubbada Dhexe Region, 41 km NE of Jilib [Gelib], along the main road to Baraawe [Brava], 0°28'N 43°12'E, fl. 13 June 1987, *Friis, Vollesen & Abdissalam Sheikh Hassan* 5012 (K); Jalalaksi Distr., 8 km SE of Buur Weyn, 3°33'N 45°36'E, fl. & fr. 11 Aug. 1987, *Kuchar* 17321 (K); Jalalaksi/Bulu Burte Distr. boundary, 7.5 km EEN of Buur Weyn, 3°37'N 45°38'E, fl. & fr. 11 Aug. 1987, *Kuchar* 17325 (K); Bulu Burte Distr., 2 km N of Bulu Burte, 3°52'N 45°35'E, fl. 9 Dec. 1987, *Kuchar* 17588 (K, holotype and isotype).

HABITAT & ECOLOGY. This species is recorded from the ground layer of open woodland and scrub usually on alluvial clay or silt plains, with variously *Acacia nilotica* (L.) Delile, *Acacia oerfota* (Forsk.) Schweinf., *Acacia zanzibarica* (S. Moore) Taub., *Balanites aegyptiaca* (L.) Delile, *Blepharispermum fruticosum* Klatt, *Cordia sinensis* Lam. and/or *Dalbergia commiphoroides* Baker f. in the shrub or tree layer. It grows at 25 – 200 m elevation.

CONSERVATION STATUS. This species is currently known only from central and southern Somalia along the Shebelle River catchment, with an EOO of 18,634 km² which falls within the “Vulnerable” range threshold under IUCN criterion B1. It has been recorded as locally common by several collectors. Some of the collecting sites had been impacted by shifting cultivation or by removal of larger woody species for fuelwood at the time of collection but this does not appear to have negatively impacted this species. That said, study of Google Earth imagery indicates that there has also been significant conversion of natural vegetation to more intensive agricultural land in some parts of its range along the Shebelle, particularly in the Janalle area west-southwest of Mogadishu. This will very likely have led to some population declines in that area. There is also considerable pressure on the water resources of the Shebelle both in Ethiopia and Somalia, with future water demands projected to increase markedly (Michalscheck *et al.* 2016). These long-term changes to water levels may impact the vegetation of the surrounding catchment. The Shebelle-Juba Catchments Freshwater Ecoregion has been assessed as Vulnerable

by Thieme *et al.* (2005), citing growing agricultural pressure and human population growth as the most likely threats, although they acknowledge that limited information is available on its current status. With less than 10 locations known and with inferred decline in extent and quality of habitat, this species is therefore provisionally assessed as **Vulnerable VU B1ab(iii)**, although with more information desirable on its current range and abundance.

ETYMOLOGY. *Barleria shebelleensis* is named after the Shebelle River, as this species is closely associated with the catchment of this major river.

NOTES. The combination of a prominently beaked, 2-seeded capsule, seeds with wavy hygroscopic hairs, an androecium comprising two fertile stamens and three minute staminodes and the plants lacking spines place *Barleria shebelleensis* in sect. *Somalia* (Oliv.) Lindau (Balkwill & Balkwill 1997; Darbyshire 2009). This species also has medifixed hairs on the vegetative parts, bluish-green foliage and corollas which are (at least sometimes) streaked in the throat, characters that together place this species in Balkwill's (1993) “Group 1” of sect. *Somalia* which contains the *Barleria argentea-parviflora* complex. This group is challenging taxonomically, containing a number of closely allied species in NE Africa and Arabia that are usually separable by a range of morphological characters but with occasional intermediates suggesting that hybridisation is not uncommon (see discussion in Darbyshire 2010: 407). This complex is in need of detailed taxonomic study, combining molecular and morphological analyses. That said, *B. shebelleensis* is one of the most easily recognisable and discrete members of this complex in view of its unique calyx configuration in which the anterior lobe is more similar to the lateral lobes than it is to the markedly enlarged posterior lobe. It also has a less markedly zygomorphic corolla than other members of this complex, as the abaxial lobe is only shortly offset.

M. Hedrén had annotated the folders of this species at K with the provisional name “*kuchari*” but in the *Flora of Somalia* account (Hedrén 2006a) he treated it as a form of *Barleria hochstetteri* noting it as “a fairly distinct form...similar to *B. argentea* in its narrow calyx lobes, but has an upright shrubby growth and agrees with *B. hochstetteri* in the large and wide leaves and more evenly dispersed hairs, as well as spreading thin hairs” (p. 436). Hedrén did not include *Virgo* 40 and *Alstrup & Michelsen* 66 within this form, listing these separately as specimens of *B. hochstetteri* tending towards *B. argentea*. However, these two specimens clearly belong to the same taxon as the rest of the material cited above. He appears to have missed the fact that the anterior and posterior calyx lobes are markedly dimorphic in this species.

On *Kuchar* 17046, this species is recorded as a “dwarf shrub to 1 m” but on the three sheets of that collection at

K, the specimens are less than 40 cm tall in keeping with all other material seen, hence the maximum height is recorded as “?– 100 cm” in the description.

The status of *Barleria parviflora* in Somalia

Hedrén (2006a) considered that *Barleria argentea* and *B. parviflora* may be conspecific. He did not record *B. parviflora* from Somalia but noted some collections from northern Somalia “approach *B. parviflora* by having bracts that are lanceolate to ovate (rather than triangular)” (p. 435). However, whilst there are some potential intermediate specimens, these two species are usually very easily separated (e.g. by the glabrous capsules of *B. parviflora*; see Ensermu 2006 for other differences) and should be maintained as distinct species. *B. parviflora sensu stricto* occurs in northern Somalia where it is represented by a number of specimens; these are cited below, together with representative specimens from the other countries in which it occurs (two per country).

Barleria parviflora R. Br. ex T. Anderson (1863: 29); Clarke (1899: 156); Wood (1997: 272); Ensermu (2006: 423); Darbyshire *et al.* (2015: 345).

DISTRIBUTION. *Barleria parviflora* is recorded from Saudi Arabia, Yemen, Sudan, Eritrea (fide Ensermu 2006), Ethiopia and Somalia.

COLLECTIONS STUDIED. SOMALIA. Golis Range, Somaliland, fl. 15 May 1906, *Drake-Brockman* 247 (K); Hargeisa, fl. & fr. July 1929, *Burne* 82 (K); Hargeisa, 9°33'N, 44°1'E, fl. & fr. 23 Sept. 1932, *Gillett* 3991 (K); Duwi Pass, 10°5'N, 44°15'E, fl. & fr. 19 Oct. 1932, *Gillett* 4365 (K); 9°48'N, 43°17'E, old infl. May 1933, *Godding* 32 (K); Buramo, 9°56'N, 43°11'E, fl. & fr. June 1933, *Godding* 56 (K); “British Somaliland”, without precise locality, fl. 3 Sept. 1941, *Peck* 423 (EA, K); Wadaba, Gubari, fl. & fr. 6 June 1945, *Glover & Gilliland* 1200 (EA, K); Elmis (Summit), fl. 5 May 1949, *Guichard* in EA 10679 (EA); 8 miles NW of Borama, fl. & fr. 4 Oct. 1954, *Bally* 9955 (EA, K); 18 miles E of Hargeisa, fl. & fr. 25 Sept. 1956, *Bally* 10830 (K); Hargeisa, fl. 6 Oct. 1962, *Keogh* 42 (K); 10 km NW of Hargeisa, 9°35'N 44°00'E, fl. & fr. 6 Nov. 1969, *Robertson* 1343 (EA, ETH); Sheikh, fl. & fr. May 1972, *Wood* 5/72/38 (EA, K); Togdheer Region, Sheek Distr., Gaan Libah, 9°52'N, 44°50'E, fl. & fr. 19 Nov. 1979, *Hansen et al.* 6453 (EA, K); NW Somalia site A/18, 10°12'N, 43°36'E, fl. & fr. 2 July 1981, *Gillett & Watson* 23701 (EA, K); without locality & date, fl., *Godding* 47 (K).

REPRESENTATIVE SPECIMENS FROM OTHER COUNTRIES.

SAUDI ARABIA. 45 km S of Dharan, Najran road, fl. & fr. 29 April 1979, *Collenette* 1476 (K); ¼ way up the escarpment, Taif – Jeddah road, fl. 12 March 1982, *Collenette* 3381 (K). **YEMEN.** E side of the Haraz below Maghraba, fl. & fr. 2 June 1977, *Wood* 1683 (K);

between Bab Bahel and Mausana in the Haraz, fl. & fr. 24 Nov. 1977, *Wood* 2135 (K). **SUDAN.** Erkowit, fl. 10 Sept. 1868, *Schweinfurth* 255 (K) & fl. 16 May 1907, *Brown* 1186 (K!). **ETHIOPIA.** Afar Region, Erer R. area, 60 km W of Dire Dawa on hwy. to Addis Ababa, 9°31'N 41°25'E, fl. & fr. 23 Aug. 1961, *Burger* 632 (K); Tigray Region, 17 km W of Mekelle, on the eastern slope of the Giba R. valley, 13°31'N 39°22'E, fl. & fr. 12 Oct. 1995, *Friis et al.* 6707 (K).

CONSERVATION STATUS. *Barleria parviflora* is a widespread and locally common species of the dry bushlands and woodlands of Somalia-Masai phytogeographic region, particularly in Ethiopia, and is considered to be of **Least Concern (LC)**.

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References

- Anderson, T. (1863). An enumeration of the species of Acanthaceae from the continent of Africa and the adjacent islands. *J. Proc. Linn. Soc., Bot.* 7: 13 – 54.
- Balkwill, M. J. (1993). *A reappraisal of the generic limits and subdivision of Barleria L. (Acanthaceae)*. Unpubl. Ph.D. thesis, University of Witwatersrand, Johannesburg.
- & Balkwill, K. (1997). Delimitation and infrageneric classification of *Barleria* (Acanthaceae). *Kew Bull.* 52: 535 – 573.

- & ——— (1998). A preliminary analysis of distribution patterns in a large, pantropical genus, *Barleria* L. (Acanthaceae). *J. Biogeogr.* 25: 95 – 110.
- BirdLife International (2017a). *Important Bird Areas factsheet: Bonga forest*. [<http://www.birdlife.org>. Accessed: June 2017].
- (2017b). *Important Bird Areas factsheet: Metu - Gore - Tepi forests*. [<http://www.birdlife.org>. Accessed: June 2017].
- (2017c). *Important Bird Areas factsheet: Liben plains and Negele woodlands*. [<http://www.birdlife.org>. Accessed: June 2017].
- Clarke, C. B. (1899). *Barleria*. In: W. T. Thiselton-Dyer (ed.), *Flora of Tropical Africa*, vol. 5: 140 – 169. L. Reeve & Co., London.
- Darbyshire, I. (2009). A reassessment of the status of *Barleria* sect. *Caviostrata* (Acanthaceae) in tropical Africa, with a new species, *B. richardsiae*, described from the Tanzania-Zambia border region. *Kew Bull.* 63: 601 – 611.
- (2010). *Barleria*. In: H. J. Beentje (ed.), *Flora of Tropical East Africa. Acanthaceae (Part 2)*, pp. 325 – 442. Royal Botanic Gardens, Kew.
- (2015). *Barleria*. In: J. R. Timberlake & E. S. Martins (eds), *Flora Zambesiaca* 8 (6): 37 – 122. Royal Botanic Gardens, Kew.
- , Kordofani, M., Farag, I., Candiga, R. & Pickering, H. (2015). *The Plants of Sudan and South Sudan. An annotated checklist*. Royal Botanic Gardens, Kew.
- & Luke, Q. (2016). *Barleria mirabilis* (Acanthaceae): a remarkable new tree species from west Tanzania. *Kew Bull.* 17: 13 (6 pages).
- , Vollesen, K. & Ensermu Kelbessa (2010). Acanthaceae (Part 2). In: H. Beentje (ed.), *Flora of Tropical East Africa*. Royal Botanic Gardens, Kew.
- Ensermu Kelbessa (1982). *A palynological-taxonomic study of the genus Asystasia and a palynological study of some related genera in the Acanthaceae*. M.Sc. thesis, Addis Ababa University.
- (1989a). Two new species of *Justicia* sect. *Ansellia* (Acanthaceae) from E and NE tropical Africa. *Nordic J. Bot.* 9: 399 – 404.
- (1989b). A new species of *Asystasia* (Acanthaceae) from Ethiopia. *Bull. Jard. Bot. Natl. Belg.* 59: 413 – 418.
- (1990). *Justicia* sect. *Ansellia* (Acanthaceae). *Symb. Bot. Upsal.* 29(2): 1 – 96.
- (1993). Studies in the genus *Asystasia* (Acanthaceae) in Africa I: two new species from tropical Africa. *Opera Bot.* 121: 153 – 158.
- (1994). A revision of *Asystasia gangetica* (L.) T. Anders. (Acanthaceae). In: J. H. Seyani & A. C. Chikuni (eds), *Proceedings of the 13th Plenary Meeting of AETFAT, Zomba, Malawi, 2–11 April 1991. Vol. 1. Plants for People*, pp. 333 – 346. National Herbarium and Botanic Garden of Malawi, Zomba.
- (1998). Studies in the genus *Asystasia* (Acanthaceae) in Africa II: further new species. *Kew Bull.* 53: 929 – 935.
- (2006). Acanthaceae. In: I. Hedberg *et al.* (eds), *Flora of Ethiopia & Eritrea*, vol. 5: 345 – 495. The National Herbarium, Addis Ababa University & The Department of Systematic Botany, Uppsala University.
- (2009). Three new species of Acanthaceae from Ethiopia. *Kew Bull.* 64: 57 – 65.
- , Brummitt, R. K. & Furness, C. A. (1992). A reconsideration of *Asystasiella* Lindau (Acanthaceae). *Kew Bull.* 47: 669 – 675.
- Hedberg, I., Ensermu Kelbessa, Edwards, S., Sebsebe Demissew & Persson, E. (eds) (2006). *Flora of Ethiopia & Eritrea*, vol. 5. The National Herbarium, Addis Ababa University & The Department of Systematic Botany, Uppsala University.
- Hedrén, M. (2006a). *Barleria*. In: M. Thulin (ed.), *Flora of Somalia*, vol. 3: 427 – 442. Royal Botanic Gardens, Kew.
- (2006b). New species and combinations in Acanthaceae from Somalia. *Willdenowia*. 36: 751 – 759.
- IUCN (2012). *IUCN Red List Categories and Criteria. Version 3.1. Second Edition*. IUCN Species Survival Commission, Gland & Cambridge.
- IUCN Standards and Petitions Subcommittee (2017). *Guidelines for Using the IUCN Red List Categories and Criteria. Version 13*. Prepared by the Standards and Petitions Subcommittee. [<http://www.iucnredlist.org/documents/RedListGuidelines.pdf>. Accessed: June 2017].
- Michalscheck, M., Petersen, G. & Gadein, H. (2016). Impacts of rising water demands in the Juba and Shabelle river basins on water availability in south Somalia. *Hydrological Sci. J.* 61: 1877 – 1889.
- Sebsebe Demissew, Bytebier, B., *et al.* (2016). Professor Ensermu Kelbessa. *J. East African Nat. Hist.* 105: 203 – 211.
- Thieme, M. L., Abell, R., Stiassny, M. L. J., Skelton, P., Lehner, B., Teugels, G. G., Dinerstein, E., Toham, A. K., Burgess, N. & Olson, D. (2005). *Freshwater Ecoregions of Africa and Madagascar. A conservation assessment*. World Wildlife Fund; Island Press, Washington.
- Vivero, J. L., Ensermu Kelbessa & Sebsebe Demissew (2005). *The Red List of Endemic Trees and Shrubs of Ethiopia and Eritrea*. Fauna & Flora International, Cambridge.
- , ——— & ——— (2006). Progress on the Red List of plants of Ethiopia and Eritrea: conservation and biogeography of endemic flowering taxa. In: S. A. Ghazanfar & H. J. Beentje (eds), *Taxonomy and Ecology of African Plant, their Conservatino and Sustainable Use. Proceedings of the 17th AETFAT Congress, Addis Ababa, Ethiopia*, pp. 761 – 778. Royal Botanic Gardens, Kew & National Herbarium, Addis Ababa University.
- Vollesen, K. & Ensermu Kelbessa (2010). *Asystasia*. In: H. J. Beentje (ed.), *Flora of Tropical East Africa. Acanthaceae (Part 2)*, pp. 325 – 442. Royal Botanic Gardens, Kew.
- Wood, J. R. I. (1997). *A Handbook of the Yemen Flora*. Royal Botanic Gardens, Kew.