



Hibiscus fabiana sp. nov. (Malvaceae) from the Guinea Highlands (West Africa)

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Key words

Bowal
conservation
Furcaria
Guinea Highlands
Hibiscus
Important Plant Areas
Simandou

Abstract *Hibiscus fabiana* Cheek (sect. *Furcaria*, Malvaceae) is described from the Guinea Highlands of West Africa, and its taxonomic affinities and ecology are considered. *Hibiscus fabiana* has previously been confused with *H. rostellatus* but has red fleshy calyx ribs (vs not red and non-fleshy), the calyx surface is glabrous apart from 1-armed bristles (vs densely covered in minute white stellate hairs and bristles 2–5-armed), the leaves 3(–5)-lobed, bases truncate to rounded (vs 5-lobed, cordate). The conservation status of the new species is assessed using the IUCN 2012 standard as Vulnerable. In the context of the recently discovered extinction of the Guinean endemic *Inversodicraea pygmaea* G. Taylor (Podostemaceae), we discuss the 30 new species to science discovered in Guinea since 2005, all but one of which are also range-restricted and threatened, usually by development or habitat loss. We consider it urgent to avoid their extinction, ideally with *in situ* conservation using an Important Plant Areas approach.

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INTRODUCTION

The flora of Guinea (245 857 km²) is diverse in a West African context. Lisowski (2009), details c. 3 000 species with numerous endemic species. From 2005 to present, botanical surveys have been conducted for conservation management purposes, first in the Simandou Range in Guinea and then in other parts of the Guinea Highlands in West Africa by botanists of the Royal Botanic Gardens, Kew, and of the National Herbarium of the Université Gamal Abdel Nasser, Conakry, Guinea. In the course of this work several new species restricted to the Guinea Highlands have come to light (see Discussion). Among these is a new species described in this paper as *Hibiscus fabiana* Cheek. The genus *Hibiscus* L., as currently delimited, with 1 449 names listed by IPNI (continuously updated), comprises about 420 accepted species. Species of the genus are pantropical and subtropical, but with some representation in the temperate zones. They vary from annual herbs to small trees. The flowers usually have an epicalyx with > 5 free or partly united, usually narrowly triangular, non-foliose, non-fleshy, bracteoles. The styles bear five branches, each terminating in a capitate stigma. The fruit is a 5-valved, dehiscent loculicidal capsule, each locule holding three or more seeds. New taxa of *Hibiscus* are still steadily being discovered and published, e.g., *Hibiscus vitifolius* L. subsp. *lukei* Mwachala & Cheek (Mwachala & Cheek 2003), *H. bennettii* L.A.J. Thomson & Braglia (Thomson & Braglia 2019) and *H. hareyae* L.A.J. Thomson & Cheek (Thomson & Cheek 2020).

The species of *Hibiscus* fall into several clearly defined sections, enumerated for the African species by Ulbrich (1921). The West African species were treated by Keay (1958). The

material described below as *H. fabiana* falls clearly in sect. *Furcaria* DC., since it possesses setose fruit valves, and a fruiting calyx that is leathery to fleshy, with raised, rib-like veins along the midrib of each sepal and from the receptacle to the notch of each sinus, continuing along the margin of the sepals. Forked epicalyx bracts are also present, from which the section takes its name, but which are not present in all species. Most species of this very distinct section bear a nectary gland on the abaxial surface of the leaf midrib and on the midrib of the sepals, but *H. fabiana* is one of the minority of species in the section that lacks this character. Section *Furcaria* contains several commercially important and widely cultivated species, such as kenaf (*H. cannabinus* L.) for fibre, roselle (*H. sabdariffa* L.) with edible fleshy calyces used for making juices and tea, and *H. acetosella* Welw. ex Ficalho used as a vegetable. However, there are also several rare, localized species such as *H. sparseaculeatus* Baker f. (Cheek 1992), which, like *H. fabiana*, are not used.

Hibiscus sect. *Furcaria* is pantropical. While *Hibiscus* as a whole has been shown to be polyphyletic, sect. *Furcaria* appears monophyletic on existing molecular evidence (Pfeil et al. 2002). The section was competently revised for Africa and Asia by Wilson (1999) who treated 33 species from this area and estimated that over 100 species occur globally. Our material keys out in Wilson (1999) as *H. rostellatus* Guill. & Perr. by virtue of possessing aculeate stems with simple, non-stellate hairs of c. 3 mm long, bifurcate involucellar (epicalyx) bracts, a peduncle articulated closer to the epicalyx than to the stem, lower and mid-stem leaves entire or shallowly lobed and lacking lanate pubescence. In Keay (1958) our material keys out to the couplet leading to both *H. noldeae* Baker f. and *H. rostellatus*, bridging the distinction between the species which is used in the key, that is in having pedicels ('peduncles' in Wilson 1999) (1–)1.3–2.3(–2.7) cm long rather than 'up to 2 cm long' (*H. noldeae*) or '2–13 cm long' (*H. rostellatus*).

The three earliest collected specimens of *H. fabiana* known to us date from 1965 (see additional specimens below), deriving from Mt Nimba (Liberia) and the Loma Mtns (Sierra Leone).

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They were seen by F.D. Wilson and were evidently regarded by him as problematic, not fitting clearly into any of his accepted taxa. All had been earlier determined *H. rostellatus* by various botanists, and the two specimens from Nimba were cited as among 'a number of variant forms of *H. surattensis* L.' by Wilson (1999: 53). From *H. surattensis* our taxon clearly differs, e.g., in lacking the characteristic large reniform-auriculate foliaceous stipules of that species. With the benefit of many more specimens of this 'variant form', which are all coherent with each other in morphology, ecology and geography, it is clear that this entity comprises a distinct as yet undescribed species, *H. fabiana*.

While our material is closely similar to *H. noldeae* and has almost identical calyx indumentum it crucially lacks the calyx nectary gland that characterises this and many other species of sect. *Furcaria*. It also lacks the very deeply lobed leaves of *H. noldeae*.

Vegetatively, *H. fabiana* is most likely to be confused with *H. rostellatus* since both species can have shallowly 5-lobed hairy leaves (but usually 3-lobed in *H. fabiana*) and climbing stems, which are both aculeate and long simple hairy. However, the leaves of *H. rostellatus* are always larger and thicker than those of our material, which usually has only 3-lobed, thinly papery leaves, and in *H. rostellatus* the whole plant is usually very densely, rather than sparsely long-hairy, with usually larger peduncle-pedicels (the ranges overlap slightly). The two species can be immediately separated by the indumentum of the calyx. In *H. rostellatus* the raised rib-like veins bear swollen-based bristle-like hairs with 2(–5) arms and the intercostal areas are densely covered with small white stellate hairs; in *H. fabiana* the ribs bear simple bristle-like hairs and the intercostal areas sometimes bear a very few simple hairs but otherwise are glabrous. Additional diagnostic characters separating *H. fabiana* from *H. rostellatus* and *H. noldeae* are shown in Table 1.

MATERIALS AND METHODS

Herbarium material was examined with a Leica Wild M8 dissecting binocular microscope fitted with an eyepiece graticule measuring in units of 0.025 mm at maximum magnification. The drawing was made with the same equipment with a Leica 308700 camera lucida attachment. Specimens, or their high resolution images, of all African species of sect. *Furcaria* were inspected from the following herbaria: BM, EA, K, MO and P. All specimens cited have been seen unless indicated 'n.v.'. Names of species and authors follow the International Plant Names Index (IPNI continuously updated). Nomenclature follows Turland et al. (2018). Technical terms follow Beentje & Cheek

(2003). The format of the description follows those in other papers describing new species of *Hibiscus*, e.g., Cafferty & Cheek (1996). The conservation assessment follows the IUCN (2012) categories and criteria. Herbarium codes follow Index Herbariorum (Thiers continuously updated). The map was made using simplemappr software (<https://www.simplemappr.net/>).

RESULTS AND DISCUSSION

Hibiscus fabiana Cheek, sp. nov. — Fig. 1, 2; Map 1

Differs from *H. rostellatus* Guill. & Perr. in that the calyx intercostal areas are glabrous or with a few simple hairs, not densely stellate-hairy; costae with bristle-hairs 1-armed, not 2(–4)-armed; from *H. noldeae* Baker f. differs in calyx nectary gland absent, not present, leaf blade lobed for (0–)20–33 % of its radius, not 70–90 %. — Type: Cheek 13904 (holo HNG; iso BR, K, MO, P, WAG), Guinea, Guinée Forestière, Beyla Prefecture, Mts Kourandou, Sinko, Bronkedou, N8°53'03" W8°18'27", 1040 m, fl., 28 Oct. 2008.

Etymology. Named as a noun in apposition, in honour of Fabiana Goodman of the Ellis Goodman Family Foundation, the latter is the principle supporter of the Royal Botanic Gardens, Kew's Tropical Important Plant Area (TIPAs) programme in Guinea.

Perennial, slender, scandent *herb*, to 2 m tall. *Stems* producing 'gum' (possibly mucilage) when cut, reaching 5 m long, internodes 3–5(–12) cm long, 2–4 mm diam, with a densely pubescent longitudinal band of c. 1 mm wide, hairs brown, 0.5(–1) mm long, otherwise stems sparsely hairy. *Indumentum*: hairs simple, (1–)1.5–2(–2.5) mm long with scattered, conspicuous retrorse, translucent aculei (0.6–)1–1.5 by c. 0.5 mm, on red keel-like (not globose) bases (Fig. 1c). *Stipules* narrowly oblong, 6–10 by (0.5–)1–1.5(–2) mm, margins moderately densely hairy, hairs (0.5–)1–2 mm long (Fig. 1d). *Leaves*: petioles terete, 3.2–8.5(–9.5) cm long, with indumentum and aculei as that of the stems; blades (4.7–)5.7–7.8(–11) by 3.6–7.9(–10.1) cm, mid-stem leaves shallowly 3(–5)-lobed by a third to a fifth of the radius of the blade, main acumen 0.5–1.5(–2) cm long, base obtuse, broadly rounded or truncate, rarely very shallowly cordate, suborbicular in outline, the lobes triangular, abaxial surface sparsely hairy, hairs white-translucent, 0.5–1 mm long, the primary nerves with aculei as those of the stem but smaller (Fig. 1b), adaxial surface glabrous or with a very few occasional hairs, the margin dentate-serrate, 2–3 teeth per cm, the teeth 1–3 mm long, midrib nectary absent. *Flowers* 8–9 cm diam when open, yellow with purple centre, axillary, solitary, up to 12 per stem in the most distal axils; peduncles-pedicels (1–)1.3–2.3(–5) cm long, articulated c. 5 mm below the epicalyx, indumentum as the stem but lacking the pubescent band. Involucellar *bracteoles* of the epicalyx (9–)10(–11), ligulate, 11–12(–15) by (0.5–)1 mm, sparsely simple-hairy,

Table 1 Diagnostic characters separating *Hibiscus rostellatus*, *H. fabiana* and *H. noldeae*.

	<i>Hibiscus rostellatus</i>	<i>Hibiscus fabiana</i>	<i>Hibiscus noldeae</i>
Leaf shape	Entire or shallowly 5-lobed, base cordate	Entire or shallowly 3(–5)-lobed, base rounded to truncate	Deeply (3–)5-lobed, base obtuse
Degree of leaf-blade lobing as % of radius	0–30 %	(0–)20–33 %	70–90 %
Leaf-blade midrib nectary gland	Absent	Absent	Present, conspicuous
Pedicel length	2–13 cm	(1–)1.3–2.3(–5) cm	Up to 2 cm
Epicalyx bracteole, adaxial bifurcation	Exceeds abaxial	Exceeds abaxial	Absent or shorter than abaxial
Calyx midrib and marginal nerves	Weakly thickened, only slightly differentiated from surrounding tissue, not red fleshy; nectar gland absent	Strongly thickened and red fleshy, producing red juice when crushed; nectar gland absent	Strongly thickened but only proximal portion of midrib red fleshy; nectar gland present
Calyx bristles	2–5-armed	1-armed	1-armed
Calyx indumentum (apart from bristles)	Densely covered in minute white stellate hairs	Absent	Absent
Altitudinal range in Guinea Highlands (m)	Up to 900 m	900–1500 m	900–1500 m

the apex bifurcate, the outer (abaxial) fork patent, elliptic, 3–4 mm long, the inner (adaxial) fork erect, ligulate to filiform, 5–7 mm long (Fig. 1f). *Calyx* 1.6–2(–2.5) cm long, divided \pm to the base, sepals 5, ovate-lanceolate, (0.6–)0.7–0.9(–1) cm wide, apex acute, midrib raised, thickened, c. 0.5 mm wide, lacking nectary, hairs (1–)2 mm long, thick-based; margins thickened (costae), and with indumentum as midrib, margins and midrib fleshy, red, producing red juice when crushed; intercostal areas glabrous or sometimes with a few sparse hairs (Fig. 1e). *Petals* 5, bright pale yellow, proximal c. 2.5 cm deep purple, obovate, 6–6.5 by 2.7–3 cm, apex rounded,

proximal margins with white silky hairs of c. 0.5 mm long. *Staminal column* c. 20 mm long, base united with petals, c. 4.5 mm diam, basal part conical, contracting to 4–5 mm from the base to a column 1.9–2 mm wide, drying pale brown, the distal antheriferous part c. 5 mm long, c. 6 mm wide, surface scattered with purple glands of c. 0.05 mm diam, each comprised of 4–5 minute globes; filaments free, 20–30, red, c. 4 mm long; anthers subglobose c. 0.9 mm diam. *Style* exerted c. 4 mm from the staminal column, drying pale brown; dividing into 5 styler arms each c. 2 mm long; stigmata capitate, purple, c. 0.8 mm diam, densely hairy, hairs c. 0.1 mm long. *Capsules*

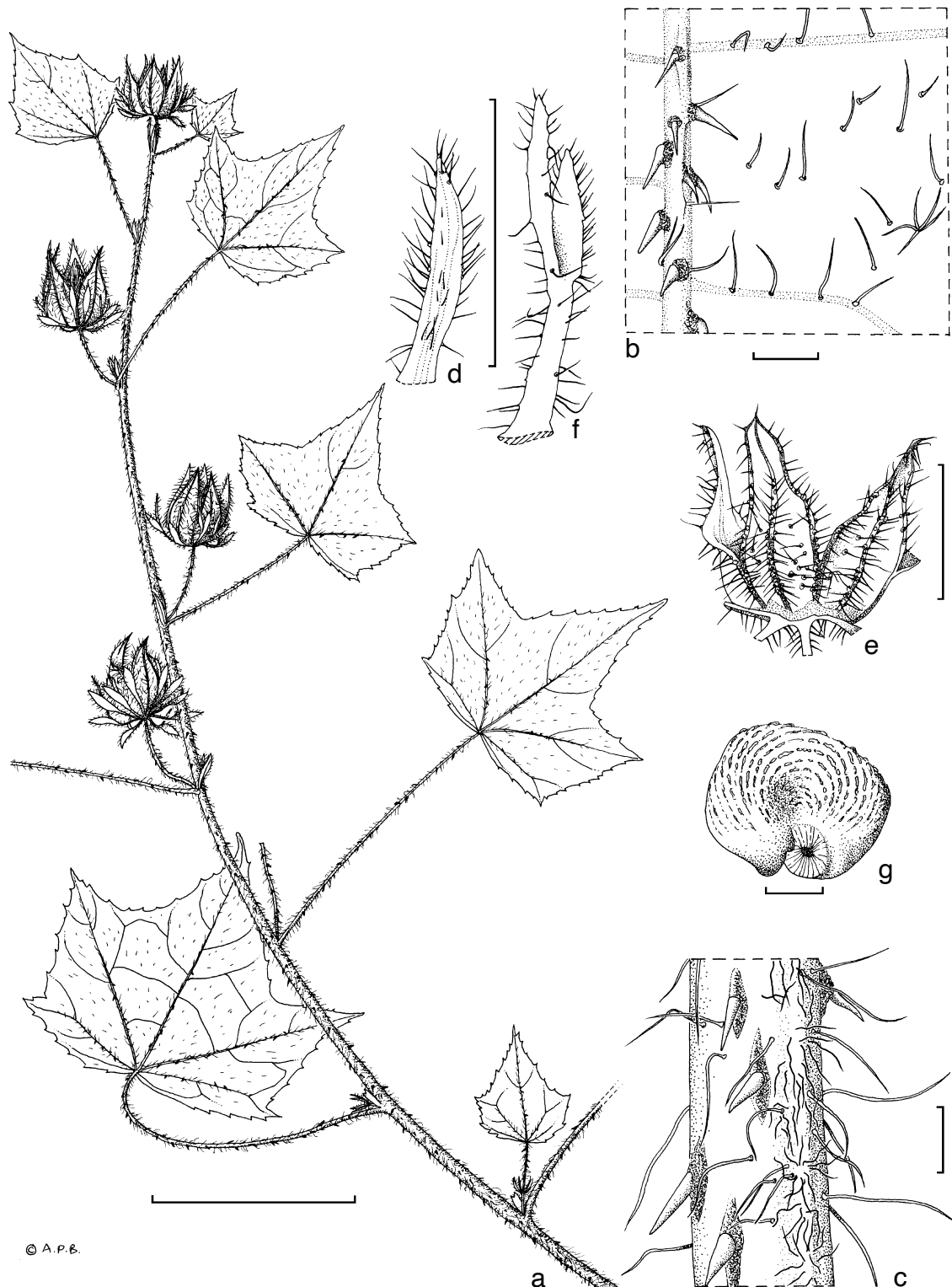


Fig. 1 *Hibiscus fabiana* Cheek. a. Habit, flowering branch; b. leaf indumentum, abaxial surface; c. stem indumentum; d. stipule, outer surface; e. calyx, with epicalyx removed; f. epicalyx bract, showing foliose appendage; g. seed (reconstructed) (a–d, f. *Harvey Y series 87*; e. *Adam 20527*; g. *Tchiengue 2686*; all K). — Scale bars: a = 5 cm; b–c, g = 1 mm; d–f = 5 mm. — Drawn by Andrew Brown.

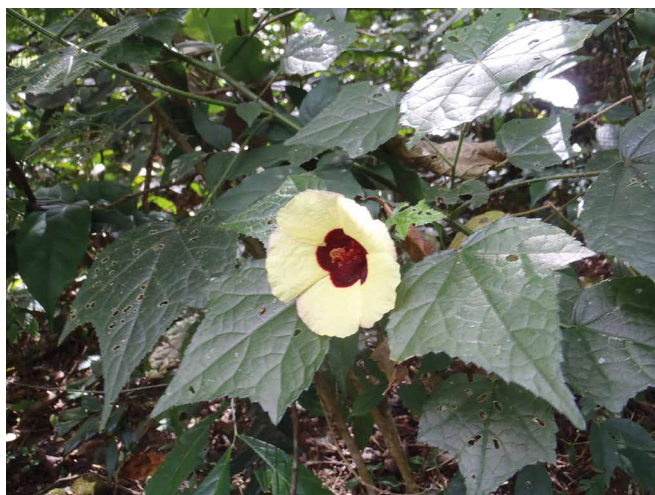


Fig. 2 *Hibiscus fabiana* Cheek. Habit, with open flower (PK Haba 118; K). — Photo by Pierre Haba.

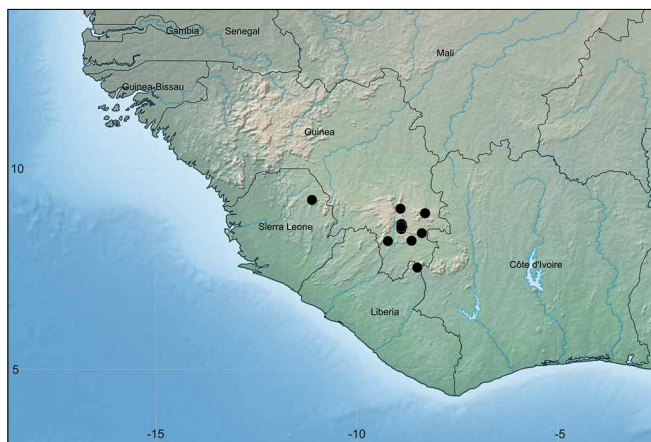
5-valved, ovoid, 1.8–2 by 0.9–1.3 cm, densely setose, beak 2–3 mm long, glabrous. Seeds subreniform, 3–3.5 by c. 2 by 1.5 mm, matt dark brown, with longitudinal lines and glossy pale brown pectinate scales (not shown in Fig. 1g).

Distribution — Guinea (Loma-Man Highlands), Liberia (Mt Nimba) and Sierra Leone (Loma Mtns). Likely to be found in the Guinea Highlands of western Ivory Coast (Mt Nimba).

Habitat & Ecology — Restricted to the transition zone (interface) between submontane forest and bowal grassland (on iron or granite): see Discussion; (500–)700–1200 m altitude.

Conservation — The new species is only known from eight locations (Simandou North, Simandou South, Mts Kourandou, Mts Tetini, Mts Ziama, Mts Bero, Mts Nimba, Mts Loma). Currently there are threats from open-cast iron-ore mining at North and South Simandou and at Nimba. At the Kourandou Mts small-holder cultivation threatens this species (Cheek pers. obs. 2008), while at the Bero Mts the introduction of Zebu cattle to the submontane grassland poses a threat to the ecotone habitat of *H. fabiana* due to trampling (Cheek pers. obs. 2016). No threats are known currently at the Loma Mts or Ziama. The area of occupancy is calculated as 88 km². At most sites only single individuals are known, but the global population is likely to be several hundreds of mature individuals. Using the categories and criteria of IUCN (2012) we assess the conservation status of this species as Vulnerable (VU B2ab(iii)).

Additional specimens and observations. GUINEA, Guinée-Forestière, Haute Guinée, **Kerouane Prefecture**, Simandou Range North, Kekour Mountain at Kerouane, N8°59'51" W8°55'10", 885 m, sterile, 22 Nov. 2007, *B. Tchiengue* 3077 (HNG, K, WAG); **Macenta and Beyla Prefectures**, Simandou Range South, Pic de Fon, forest at Whisky 1, plot G3, N8°32'57" W8°53'57", 1150 m, 04 Nov. 2005, *B. Tchiengue* in plot voucher series P 105 (HNG); Simandou Range, Pic de Fon, forest plot Y3, adjacent to elephant rock, N8°32'03" W8°54'08", 1380 m, sterile, 7 Nov. 2005, *Y.B. Harvey* Y87 (HNG); above Canga East, at start of steeper slope towards Pic de Fon, Whisky 1, N8°32'59" W8°53'59", 1075 m, fruit, 03 July 2006, *B. Tchiengue* 2686 (HNG, K); Simandou Range, Pic de Dabatini, au nord du Pic de Fon, N8°33'20" W8°53'22", 1583 m, fruit, 22 Mar. 2008, *P.K. Haba* 172 (HNG, K, WAG); Simandou Range, Pic de Foko, to the south of Pic de Fon, N8°29'28" W8°53'47", 1200 m, flowers, 21 Mar. 2008, *B. Tchiengue* 3105 (HNG, K, WAG); Simandou Range, Oueleba Hill, N8°36'50" W8°53'16", 929 m, sterile, 27 Mar. 2008, *B. Tchiengue* 3166 (HNG, K); Simandou Range, Oueleba Hill, N8°36'52" W8°53'56", 965 m, flowers, 28 Mar. 2008, *B. Tchiengue* 3175 (HNG, K, WAG); Simandou Range, Pic de Fon area, forest at the water source for Canga East camp, N8°32'57" W8°53'57", 1150 m, sterile, 04 Nov. 2005, *B. Tchiengue* P105 (HNG); foot of Simandou range, east of Pic de Fon, near village Kotila, south of Moribadou and Canga East, N8°32'50" W8°52'30", 700 m, 29 Mar. 2008, *Simandou record of presence* 5 (Observation); Simandou Range, above Canga East, at start of steeper slope towards Pic de Fon, N8°32'59" W8°53'59", 1075 m,



Map 1 Distribution map of *Hibiscus fabiana* Cheek.

fruit, 03 July 2006, *B. Tchiengue* 2686 (HNG, K, WAG); **Beyla Prefecture**, Mts Kourandou, Seberendou, N8°53'05" W8°18'27", 1037 m, young fruit, 17 Nov. 2007, *M. Cheek* 13711 (HNG, K, P, WAG); Mts Kourandou, Sinko, Bronkedou, N8°53'03" W8°18'27", 1040 m, flowers, 28 Oct. 2008, *M. Cheek* 13904 (BR, HNG, K, MO, P, WAG); Mts Tetini, Piste entre le village de Tagbedou et le sommet du Mont Ketini dans les Monts Tetini, N8°23'21" W8°23'15", 1080 m, flowers, 07 Dec. 2007, *P.K. Haba* 118 (HNG, K, WAG); **Macenta Prefecture**, Mts Ziama, Mont Katia dans le village de Boo (Boa), near Sérédou village Boo, N8°11'29" W9°13'47", 540 m, fruit, 23 Mar. 2012, *P.K. Haba* 992 (HNG, K); **Nzérékoré Prefecture**, Mts Bérou, sur la route entre le village Laminata et le Mt Zogana, N8°12'06" W8°38'37", 933 m, flowers, 22 Nov. 2008, *P.M. Haba* 244 (HNG, K, WAG). — LIBERIA, Mts Nimba, 500 m, flower, 9 Jan. 1965, *J.G. Adam* 20527 (K, P n.v., UPS n.v.); Mts Nimba, 1300 m, flower, 21 Jan. 1965, *J.G. Adam* 20702 (IFAN n.v., K, P n.v., UPS n.v.). — SIERRA LEONE, Bumbuna, Loma Mts, Camp 2, flower, 20 Nov. 1965, *J.K. Morton* SL 2680 (K).

Note — At Simandou, *H. fabiana* is sympatric over the same altitudinal range as *H. noldeae*, but no hybrids have been detected, nor have hybrids been detected with *H. rostellatus*, which also occurs at Simandou, but only at altitudes below c. 900 m.

The submontane forest-bowal grassland ecotone

Bowal (in French, Bowé) derived from the Guinean Pular word meaning 'place without trees', and is applied in West Africa to a type of grassland that forms over a rocky substrate with soil so thin that it will not support woody plants. *Hibiscus fabiana* is restricted to the ecotone or transition area between submontane forest and bowal grassland of the Loma-Man Highlands, where the principal two vegetation types, forest and grassland, interdigitate. The submontane altitudinal band is generally taken as occurring between (500–)800–2000 m in the Guinea Highlands. Here we briefly characterise this ecotone and the two vegetation types that flank it, one on each side. This characterisation is mainly based on observations at the southern Simandou range of Guinea, but is based also on visits to most other ranges in the Loma-Man Highlands. Within this ecotone of dense tall herbs, 0.6–1.5 m tall, are several other rare and threatened species restricted to the Guinea Highlands such as *Acalypha guineensis* J.K.Morton & G.A.Levin (*Euphorbiaceae*) (Levin et al. 2007), *Lipotriche (Melanthera) tithonioides* (Aké Assi) D.J.N.Hind (*Asteraceae*) (Hind 2014), *Kotschyia tutea* (Portères) Hepper (*Fabaceae*) (Hepper 1956), and, the recently resurrected and renamed, *Coleus latericola* (A.Chev.) Phillipson, O.Hooper & A.J.Paton (*Lamiaceae*) (Phillipson et al. 2019). The plants of this ecotone appear to require high light levels not available in the forest, and deep soils, which are absent from the adjacent bowal grassland. The ecotone community is usually little effected by the annual dry-season fires that sweep the grassland, and unlike the grassland species, the constituent species mainly lack underground perennating

structures such as tubers. The bowal grassland that flanks the ecotone is short-statured, c. 1.2 m tall, due to extremely shallow soils over (usually) ironstone. It is species-diverse, and includes several globally threatened species restricted to the Guinea Highlands, such as *Rhytachne glabra* (Gledhill) Clayton (*Poaceae*) (Clayton 1969), *Eriosema spicatum* Hook.f. subsp. *collinum* (Hepper) J.K.Morton ex Verdc. (*Fabaceae*) (Verdcourt 1971), *Kotschy micrantha* (Harms) Hepper (*Fabaceae*) (Hepper 1956) (wetter areas) and recently discovered *Coleus ferricola* Phillipson, O.Hooper & A.J.Paton (*Lamiaceae*) (Phillipson et al. 2019), *Eriosema trifurum* Burgt (*Fabaceae*) (Van der Burgt et al. 2012) and *Xysmalobium samouritourei* Goyder (*Apocynaceae*) (Goyder 2009).

The submontane forest that borders the ecotone is evergreen, with numerous epiphytes and climbers, and a canopy 15–20 m high. It also contains several range-restricted and threatened species, many of which were only published in recent years: *Allophylus samouritourei* Cheek (*Sapindaceae*) (Cheek & Haba 2016a), *Brachystephanus oreacanthus* Champl. (*Acanthaceae*) (Champluvier & Darbyshire 2009), *Gymnosiphon samouritouranus* Cheek (*Burmanniaceae*) (Cheek & Van der Burgt 2010), *Isoglossa dispersa* I.Darbysh. & L.J.Pearce (*Acanthaceae*) (Darbyshire et al. 2012), *Keetia futa* Cheek (*Rubiaceae*) (Cheek et al. 2018b) and *Psychotria samouritourei* Cheek (*Rubiaceae*) (Cheek & Williams 2016).

Further new discoveries in Guinea and the need for their conservation

In the last 15 years, about thirty new species have been published from Guinea after half a century when little progress was made with botanical exploration and research. Many of these discoveries were made in connection with prospective development projects. These species include, in addition to those already mentioned above:

Eriocaulon cryptocephalum S.M.Phillips & Mesterházy (*Eriocaulaceae*) (Phillips & Mesterházy 2015), *Gladiolus mariae* Burgt (*Iridaceae*) (Van der Burgt et al. 2019), *Inversodicraea pepehabai* Cheek (Cheek & Haba 2016b), *I. koukoutamba* Cheek and *I. tassing* Cheek (all *Podostemaceae*) (Cheek et al. 2019b), *Lebbiaea grandiflora* Cheek (*Podostemaceae*) (Cheek & Lebbie 2018), *Napoleonaea alata* Jongkind (*Lecythidaceae*) (Prince & Jongkind 2015), *Striga magnibracteata* Eb.Fisch. & I.Darbysh. (*Orobanchaceae*) (Fischer et al. 2011), *Talbotiella cheekii* Burgt (*Fabaceae*) (Van der Burgt et al. 2018), *Ternstroemia guineensis* Cheek (*Pentaphragmaceae*) (Cheek et al. 2019a), *Trichantheium tenerium* Xanthos (*Poaceae*) (Xanthos et al. 2020). Discovered just over the border in Mali, *Calophyllum africanum* Cheek & Q.Luke (*Calophyllaceae*) (Cheek & Luke 2016), has now also been found in Guinea (Van der Burgt pers. comm. 2019). Two new genera, *Karima* Cheek & Riina (*Euphorbiaceae*) and *Kindia* Cheek (*Rubiaceae*) have also recently come to light in Guinea (Cheek et al. 2016, 2018a). Undoubtedly more discoveries will continue to be made as botanical surveys progress.

In the region of 2000 new flowering plant species are described each year (Willis 2017), adding to the estimated 369000 already known to science (Nic Lughadha et al. 2016) although this number is debated (Nic Lughadha et al. 2017). Widespread species tend to have already been discovered, although there are exceptions, such as *Vepris occidentalis* Cheek & Onana (*Rutaceae*) that occurs from Guinea to Ghana (Cheek et al. 2019c). More usually, newly discovered species are those that are range-restricted and so are much more likely to be threatened, such as *H. fabiana*. Evidence-based conservation assessments exist for about 21–26 % of known species, and 30–44 % of these assessments rate the species concerned

as threatened (Bachman et al. 2018). This makes it imperative to discover and publish such species so that they can be assessed, and, if merited, conservation actions taken to avoid the risk of becoming, like Guinea's *Inversodicraea pygmaea* G.Taylor (*Podostemaceae*), globally extinct (Cheek 2018, Cheek & Magassouba 2018). Designating and implementing Important Plant Areas (Darbyshire et al. 2017, continuously updated) is key to *in situ* conservation of plant species. For this reason, the Important Plant Areas (TIPAs) of Guinea have been recently designated (Couch et al. 2019) and accepted by the Government of Guinea (Col. Seyba, head of Oguipar (protected areas) pers. comm. 2019). Fortunately, *H. fabiana* occurs within four of the newly designated TIPAs, namely those of Simandou, Bero, Nimba and Ziama (Couch et al. 2019).

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