

STUDIES ON THE GENUS *BIDENS* L. (COMPOSITAE) FROM THE
EASTERN HEMISPHERE. 6. A NEW SPECIES FROM SIERRA LEONE

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ABSTRACT

A new species, *Bidens gledhillii* T.G.J. Rayner, is described and illustrated. It is endemic to the submontane and montane savanna of the Loma Mountains of north-eastern Sierra Leone, occurring chiefly in the vicinity of Bintumane Peak. It is considered to lack close relatives in Africa but has, nevertheless, frequently been confused with *B. camporum* (Hutch.) Mesfin and *B. borianiana* (Sch. Bip. ex Schweinf.) Cufod., two species of great disparity with which it is compared

KEY WORDS: *Bidens*, Compositae, taxonomy, Sierra Leone

Continuing revisional studies of Eastern Hemisphere *Bidens* L. have revealed the following new species from Sierra Leone.

Bidens gledhillii T.G.J. Rayner, *sp. nov.* TYPE: SIERRA LEONE. Loma Mountains, below summit, alt. 1710 m, 27 Mar. 1964, J.K. Morton & D. Gledhill SL.1095 (HOLOTYPE: WAG; Isotypes: FHI,GC,K).

Coreopsis camporum auct. non Hutch.: C.D. Adams in Hutch. & Dalziel, *Fl. W. Trop. Afr.*, ed. 2, 2:232. 1963, quoad Deighton 5095 & Jaeger 516.

Species nova *Bidenti borianianae* (Sch. Bip. ex Schweinf.) Cufod. affinis sed ab ea differt plantis perennibus, foliis principalibus profunde 1 vel 2 pinnatipartitis usque ad 7.5 centimetra longis margine segmentorum integro, capitulis 2.6-4.7 centrimetris diametro sub anthesi, pedunculis ad (5-)13-38 centrimetra longis,

phyllariis exterioribus 7-8(-9) anguste ovatis vel anguste ovato-ellipticis e medio versus apicem plerumque attenuatis 4.6-8.1 millimetris longis 1.5-2.4 millimetris latis sub anthesi (1-)3-6 nervatis, phyllariis interioribus usque ad 10.4 millimetra longis 4.5 millimetra latis, flosculis radii 1.2-1.9 centrimetris longis 5.5-8.2 millimetris latis, tubis flosculorum radii 1.6-2.7 millimetris longis glabris, paleis pallido- vel atrobadiis, corollis flosculorum disci 3.8-6.3 millimetris longis, antheris 2.0-3.1 millimetris longis, filis staminum 0.5-1.3 (-1.6) millimetris longis, collis florum 0.20-0.25 millimetri longis, ramis stigmatum 1.1-1.6 millimetris longis, cypselis pallido- vel atrofusis (3.8-)5.0-9.2 millimetris longis 1.9-3.9 millimetris latis (alis inclusis), alis 0.15-1.30 millimetris latis generaliter latissimis ad medium vel parum infra medium plerumque sensim supra medium attenuatis, saepe infra apicem terminatis, aristis cypselarum trigonis; differt a *Bidente camporum* (Hutch.) Mesfin foliis principalibus ovatis vel late ovatis vel ovato-trullatis vel late ovato-rhombicis in ambitu (0.8-)1.4-7.5 centrimetris longis margine segmentorum integro, petiolis ad 1.3-11.4(-14.6) millimetra longis, capitulis 8-12 millimetris altis sub anthesi solitariis ad apices caulium et ramorum, pedunculis ad (5-)13-38 centrimetra longis glabris vel pilis sejunctis, phyllariis exterioribus 7-8(-9) anguste ovatis vel anguste ovato-ellipticis e medio versus apicem plerumque attenuatis 4.6-8.1 millimetris longis 1.5-2.4 millimetris latis (1-)3-6 nervatis dorsis glabris, phyllariis interioribus uniseriatis (7-)8(-9) non connatis 2.6-4.5 millimetris latis, flosculis radii (7-)8 neutris ovario 1.3-3.2 millimetris longo 0.9-1.4 millimetris lato stylo nullo, paleis anguste ovato-oblongis vel anguste oblongo-ellipticis 4.6-8.8 millimetris longis sub anthesi, in statu fructifero usque ad 10.2 millimetra longis, appendicibus basibus antherarum collum fili basem non attingentibus, filis staminum 0.5-1.3(-1.6) millimetris longis, collis florum 0.20-0.25 millimetri longis, stylis 4.3-7.0 millimetris longis, cypselis alatis 1.9-3.9 millimetris latis (alis inclusis) pallido- vel atrofusis non profunde 8-10 sulcatis venteribus planis vel valde concavis, aristis cypselarum 0.10-0.15 millimetri latis basi.

Perennial clump forming herbs, to 0.4-1.3 m tall; stems several, arising from a branched, woody rootstock, branched at base and also usually above; stems and branches erect or ascending, terete to terete-tetragonal or obtuse angled-tetragonal especially above, 1.9-8.2 mm diam. at base, 1.6-4.3 mm diam. beneath peduncles, more or less smooth or shallow to deeply sulcate, striate, often dark brown especially below or pale brown and green-brown above, glabrous, woody chiefly toward base of stems and lower branches. Leaves decussate or sometimes uppermost alternate especially on flowering branches, sessile

to petiolate, rarely sessile; lamina deeply 1-2-pinnatipartite, with 3-5(-7) segments, rarely undivided; divided leaves ovate to broadly ovate or ovate-trullate to broadly ovate-rhombic in outline, (0.8-)1.4-7.5 cm long \times (0.5-)0.7-7.2 cm wide; primary leaf segments opposite or subopposite, undivided or deeply and often irregularly few-lobed, to (0.3-)1.2-5.4 cm long; lobes and undivided segments opposite to alternate, antrorsely inserted at 25-80° to rachis, narrowly linear-elliptic or narrowly linear-ovate to linear, usually gradually attenuated from middle toward apex and base, acute to rarely obtuse and sometimes shortly apiculate at the callose indurated apex, entire at the rounded and indurated margin, 0.2-4.7 cm long \times 0.4-3.1(-4.3) mm wide, straight or frequently somewhat incurved, flat or often broadly V-shaped in section, rarely almost conduplicate especially when young, papyraceous to subcoriaceous, pale green to green, more rarely yellow-green, glabrous or sparsely to subdensely hispid on margin, with minute (0.05-0.15 mm long), antrorse, suberect to more or less adpressed, few-cellular, sharply pointed hairs; petioles to 1.3-11.4(-14.6) mm long \times (0.4-)1.1-2.7 mm wide, usually canaliculate, narrowly to broadly winged, with wings to (0.1-)0.3-1.1 mm wide, not or slightly dilated above and below, barely clasping stem at the connate bases, glabrous or with more or less isolated, 0.1-0.3 mm long, erect, thick, basally 2 to few-cellular, uniseriate hairs toward base of margin; rachis narrowly obtriangular-oblong to narrowly obtriangular, 0.6-4.9 mm wide, flat to slightly involute at margin; uppermost alternate leaves tripartite to pinnatipartite or rarely undivided, 0.6-2.1 cm long. Capitula radiate, heterogamous, erect, 2.6-4.7 cm diam. \times 0.8-1.2 cm high at anthesis, to 1.5 cm high in fruit, solitary at stem and branch apices; receptacles flat to slightly convex; peduncles to (5-)13-38 cm long, 0.9-3.1 mm diam. at anthesis, unchanged in fruit, terete to terete-tetragonal or tetragonal, shallow to deeply sulcate, glabrous or with isolated, minute (to 0.1-0.2 mm long), erect, few-cellular, often basally swollen, uniseriate, rarely dark brown hairs; ebracteate or with 1-3(-6), alternate, divided or undivided bracts resembling the primary leaf segments, divided bracts 0.5-1.8 cm long \times 0.3-1.6 cm wide, undivided bracts and lobes 0.4-1.1 mm wide. Involucre depressed-hemispheric, glabrous or sparsely hispid-pubescent at base; outer phyllaries subbiseriate to biseriate, 7-8(-9), narrowly ovate to narrowly ovate-elliptic and usually attenuated from middle to apex, acute to obtuse and usually shortly apiculate at the slightly callose indurated apex, entire at margin, 4.6-8.1 mm long \times 1.5-2.4 mm wide at anthesis, unchanged in fruit, erect to spreading, subcoriaceous, green, often slightly darker in apical half, with (1-)3-6, usually branched, frequently paired, red-brown nerves, glabrous or ventral surface sparsely to subdensely pubescent chiefly in basal half, with minute (0.05-0.15 mm long), thin, uniseriate, unibasal, few-cellular, often pale brown, flexuous hairs; inner phyllaries uniseriate, not fused, (7-)8(-9), narrowly ovate to ovate or rarely triangular-ovate, subacute to obtuse or rounded at apex, entire at margin, 6.1-10.4 mm long \times 2.6-4.5 mm wide at anthesis, unchanged in fruit,

erect, papyraceous above, becoming callose thickened and coriaceous below, pale to dark brown, often black-brown at apex, stramineous at the 0.2-0.7 mm wide, membranous margin, with numerous, longitudinal, percurrent nerves, dorsal surface sparsely hairy, with minute (ca. 0.1 mm long \times ca. 0.1 mm wide), spherical to subspherical or conical, sessile, few-cellular, brown to black-brown, glandular hairs, ventral surface glabrous, apex and often apical half of margin puberulous, with 0.10-0.15(-0.20) mm long, uniseriate, few-cellular, thin, erect, apically rounded, straight, often brown or brown-black hairs. Ray florets (7-)8, neuter; ovary oblong to obovate-oblong, 1.3-3.2 mm long \times 0.9-1.4 mm wide, apex and apical 1/2-2/3 of margin with minute (0.05-0.15 mm long), erect, few-cellular hairs, style absent; corolla tube 1.6-2.7 mm long, glabrous; ray yellow, ovate-elliptic to oblong-elliptic, 1.2-1.9 cm long \times 5.5-8.2 mm wide, with (10-)12-18, darker nerves, glabrous; apex rounded, entire or usually irregularly 2-3(-4)-denticulate, with teeth 0.2-1.3 mm long \times 0.1-1.6 mm wide. Paleae narrowly ovate-oblong to narrowly oblong-elliptic, acute to obtuse or rounded and sometimes shallow erose at apex, entire at margin, 4.6-8.8 mm long \times 1.0-3.1 mm wide at anthesis, to 10.2 mm long in fruit, thin and membranous, glabrous, pale stramineous, with 5-21, mostly paired, light to dark red-brown, percurrent, longitudinal nerves. Disc florets (28-)36-47; corolla yellow, glabrous; limb campanulate-cylindric to campanulate, 2.5-3.8 mm long \times 0.9-1.2 mm diam., usually slightly annularly thickened at base, apex 5-lobed; lobes triangular, acute at apex, 0.4-0.7 mm long \times 0.3-0.5 mm wide; limb abruptly or subabruptly attenuated below into a narrow, 1.3-2.5 mm long \times 0.5-0.6 mm wide, terete tube; anthers 2.0-3.1 mm long \times 0.7-0.9 mm diam., dark brown to black; endothecial tissue with polarized thickening; apical appendages ovate to broadly ovate or broadly ovate-triangular, acute to obtuse at apex, 0.30-0.35 mm long \times 0.25-0.30 mm wide, with a pale, longitudinal median nerve, margins slightly reflexed; basal appendages sagittate, not reaching base of the filament collar; collar 0.20-0.25 mm long \times 0.10-0.15 mm wide; filament 0.5-1.3(-1.6) mm long, flat to convex and involute; style 4.3-7.0 mm long, cylindric to slightly or decidedly bulbous at base, with caudate, 1.1-1.6 mm long branches; stylopodium cupuliform. Cypselas laterally bialate; wings shiny, stramineous, flat or slightly to decidedly incurved and partially concealing ventral face of cypselas, occasionally somewhat recurved, 0.15-1.30 mm wide, generally broadest at or slightly below middle, usually gradually attenuated above and often terminating below apex, margin densely setose, with to 0.4 mm long, suberect, antrorse, pale stramineous, pointed setae; body narrowly elliptic to elliptic or rarely narrowly ovate-elliptic, (3.8-)5.0-9.2 mm long \times 1.9-3.9 mm wide incl. wings, light to dark brown, strongly compressed; dorsal face slightly to strongly convex; ventral face flat to strongly concave, usually with a raised, longitudinal, median rib; both faces shallow 8-10-sulcate, glabrous or with minute (to 0.1-0.2 mm long), more or less adpressed, antrorse setae chiefly in apical half and along ventral median rib; apex shortly erect-

setose, laterally biaristate or rarely exaristate; aristae erect to slightly divergent, rigid, trigonous, pale brown; to 0.4-4.8(-5.3) mm long \times 0.10-0.15 mm wide at base, antrorsely barbed only on angles, with barbs to 0.1 mm long and gradually diminishing above; base of cypsela with a short (to 0.1-0.3 mm long), ventrally dilated, dorsally produced, cartilaginous carpodium. Figure 1.

FLOWERING. Throughout the year. HABITAT. Submontane savanna, grassland. Alt. 1300-2000 m.

PARATYPES: SIERRA LEONE. Northern Province - Kabala, Mt. Loma, Bintumane [09° 13' N 11° 07' W], 21 Nov. 1965, *J.-G. Adam 22105* (MO); Bintumane Mt. [09° 13' N 11° 07' W], alt. 1670-2000 m, 18 Jul. 1960, *T.S. Bakshi 240* (K); Bintumane Peak [09° 13' N 11° 07' W], alt. 1830 m, 2 May 1949, *F.C. Deighton 5095* (K); Loma Mts., National Park on plateau [09° 11' N 11° 08' W-09° 14' N 11° 11' W], 18 Feb. 1966, *D. Gledhill 358* (FHI,GC,K,WAG); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], Nov. 1944, *P. Jaeger 516* (P); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], alt. 1900 m, 26 Sep. 1945, *P. Jaeger 1140* (P); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], alt. 1600 m, 29 Jul. 1964, *P. Jaeger 6945* (G[2 sheets],P); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], alt. 1600 m, 3 Dec. 1965, *P. Jaeger 8368* (P); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], alt. 1600 m, 31 Jan. 1966, *P. Jaeger 9172* (P); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], alt. 1550 m, 24 Feb. 1966, *P. Jaeger 9390* (K,M,P); Mt. Loma [09° 18' N 10° 55' W-09° 05' N 11° 12' W], alt. 1300 m, 15 Mar. 1966, *P. Jaeger 9523* (P).

Bidens gledhillii is restricted to the Loma Mountains of north-eastern Sierra Leone, occurring chiefly on Bintumane Peak and the surrounding plateaux. The Loma Mountains form part of the Guinea Dorsale which extends from the Fouta Djallon Plateau in western Senegal, across north-eastern Sierra Leone to the Simandou Massif, the Nimba Mountains in north-eastern Liberia and southern Guinea, to the Man in western central Ivory Coast. The greater part of the Loma is a north-south running plateau of about 750 m on which rests the 1300 m plateau at the north containing the truncated pyramid of Bintumane Peak (Cole 1968) which at 2130 m is the highest point in Sierra Leone. The major parent rock is granite interspersed with acid gneisses (Anderson 1966) which produces as the result of climatic and vegetational weathering a zonal lateritic soil. The predominant vegetation type on the plateau is forest-savanna mosaic, with montane vegetation occurring with increasing altitude on Bintumane Peak. At the lower reaches of its occurrence *B. gledhillii* is found in submontane shrub savanna (ca. 910-1700 m). Much of this area of Loma is ravaged annually by fire at the end of the wet season in December and January, producing a composition of shrubby plants scattered at 6-30 m from each other among low grasses and herbs (Cole 1968). The commonest shrubs include *Dissotis fruticosa* (Brenan) Brenan & Keay, *Kotschyia ochreatea* (Taub.)

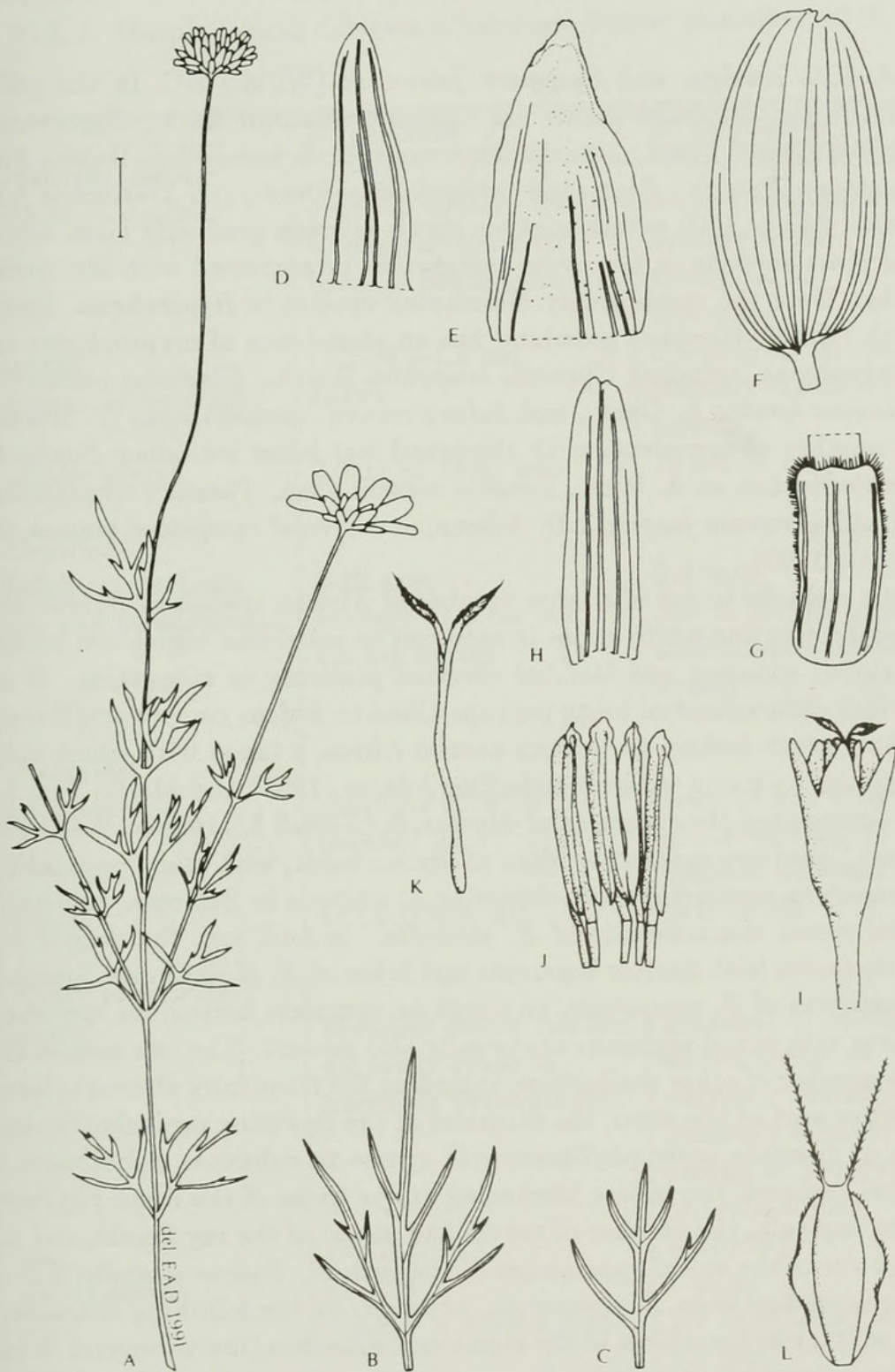


Figure 1. *Bidens gledhillii* T.G.J. Rayner. A. Habit. B & C. Principal leaves. D. Outer phyllary. E. Inner phyllary. F. Ray floret. G. Ovary of ray floret. H. Palea. I. Disc floret. J. Stamens. K. Style. L. Cypsela. Scale bar: A = 2.0 cm. B & C = 1.4 cm. D, E, & H = 2.0 mm. F = 3.6 mm. G = 1.0 mm. I = 1.6 mm. J = 1.2 mm. K = 1.4 mm. L = 2.6 mm. All drawn from Morton & Gledhill SL.1095 (WAG).

Dewit. & P.A. Duvign. and *Syzygium guineense* (Willd.) DC. In the grass-herb synusia the dominant plants are *Ctenium newtonii* Hack., *Hyparrhenia chrysargyrea* (Stapf) Stapf, *Loudetia kagerensis* (K. Schum.) C.E. Hubb., *Panicum congoense* Franch., *Rhytachne rottboellioides* Desv., and *Tristachya fulva* C.E. Hubb. Above 1700 m submontane shrub savanna gradually gives way to montane grass savanna, a low grass community interspersed with low shrubs and herbs. Here the most widely distributed species is *Hyparrhenia diplandra* (Hack.) Stapf. Montane grassland has an abundance of cryptophytes and hemicryptophytes including *Cyanotis longiflora* Benth., *Gladiolus psittacinus* Hook., *Leocus lyratus* A. Chev., and *Solenstemnon monostachyus* (P. Beauv.) Briq., a number of succulents with thickened leaf bases including *Euphorbia depauperata* Hochst. ex A. Rich., *Sopubia mannii* Skan, *Thesium tenuissimum* Hook. f. and *Vernonia jaegeri* C.D. Adams, and several caespitose grasses and sedges (Cole 1968).

Bidens gledhillii is one of a large number of African species of *Bidens* with restricted distribution which occur in montane or subalpine vegetation on solitary or closely grouped and isolated elevated plateaux or mountains. It appears to lack close relatives, being perhaps allied to *Bidens camporum* (Hutch.) Mesfin from north-eastern to western central Africa, a taxon with which it has been confused by many workers including Adams (1963) and Mesfin who has recently determined the specimen of *Morton & Gledhill SL.1095* at WAG with this name. These two species are often of similar habit, with many populations of *B. camporum*, especially those occurring at altitude in Ethiopia, possessing the tufted stems characteristic of *B. gledhillii*. In addition, the deeply pinatifid leaves with narrow segments and lobes of *B. gledhillii* are found on many specimens of *B. camporum*, although on complete herbarium specimens some leaves with broad segments are usually also present. The two species also possess a number of other similarities, including the frequently alternate leaves on the upper part of the stem, the diameter of the flowering capitula, the sub-biseriate or biseriate outer phyllaries with sparse to subdense pubescence on the ventral surfaces, the callose thickening at the bases of the inner phyllaries in fruiting capitula, the number of nerves and shape of the ray florets, and the shape and size of the apical appendages of the anthers. *Bidens gledhillii* is most easily distinguished from *B. camporum*, however, by the following characters: capitula solitary at the apices of the stems and branches (few to several in lax, sometimes corymbose, cymes in *B. camporum*), peduncles usually 13-38 cm long and glabrous or with isolated hairs (not usually 6-17 cm long and more or less densely pilose especially beneath the capitula) and cypselas winged (not unwinged). In addition a large number of other differences between the two taxa are apparent (see Table 1) which strongly suggest that the similarities exhibited by the two taxa are the result of parallelism.

Another taxon with which *Bidens gledhillii* has been confused is *B. borianiana* (Sch. Bip. ex Schweinf.) Cufod., a species which occurs in a broad band

TABLE 1. Morphological differences between *Bidens gledhillii* and *B. camporum*.

	<i>B. gledhillii</i>	<i>B. camporum</i>
<i>Principal leaves</i>		
shape in outline	ovate to broadly ovate or ovate-trullate to broadly ovate-rhombic	ovate-triangular to broadly ovate- triangular or triangular
length	(3.7-)4.3-7.5 cm	5.5-19.0(-27.3) cm
margin of segments	entire	coarsely lobed or serrate
petiole length	3.6-11.4(-14.6) mm	19.8-63.1 mm
<i>Capitula</i>		
height at anthesis	8-12 mm	5-8 mm
no. and arrangement	solitary at stem and branch apices	few to several in lax, sometimes corymbose, cymes
<i>Peduncles</i>		
indumentum	glabrous or with isolated hairs	more or less densely pilose especially beneath capitula
length	to (5-)13-38 cm	to 6-17 cm
<i>Outer phyllaries</i>		
shape	broadest below middle; narrowly ovate to narrowly ovate-elliptic	broadest at middle or above; linear to narrowly oblong or narrowly elliptic- oblong to narrowly obovate-oblong
no.	7-8(-9)	8-21(-30)
no. of nerves	(1-)3-6	1-3(-4)
size	4.6-8.1 × 1.5-2.4 mm	2.9-18.0(-32.9) × 0.5- 1.7 mm
dorsal surface indumentum	glabrous	pilose
<i>Inner phyllaries</i>		
no. of series	uniseriate	subbiseriate or biseriate
no.	(7-)8(-9)	(10-)12-16(-21)
width	2.6-4.5 mm	0.9-2.7 mm
connation	not fused	fused for 1/6-1/2 of length

TABLE 1. Continued.

<i>Ray florets</i>		
no.	(7-)8	(7-)8-15(-18)
ovary	neuter, style absent, 1.3-3.2 × 0.9-1.4 mm	fertile, cypsela 2.0- 6.2 × 0.9-1.8 mm
<i>Paleae</i>		
shape	broadest at or below middle; narrowly ovate- oblong to narrowly oblong-elliptic	broadest above middle; narrowly oblong-obovate to narrowly elliptic- obovate
length at anthesis	4.6-8.8 mm	2.3-5.0 mm
length in fruit	to 10.2 mm	to 8.1 mm
<i>Anthers</i>		
basal appendages	not reaching base of filament collar exceeding base of	usually reaching or filament collar, occasionally not reaching
collar length	0.20-0.25 mm	0.35-0.40 mm
filament length	0.5-1.3(-1.6) mm	1.7-2.7 mm
style length	4.3-7.0 mm	2.8-4.6 mm
<i>Disc cypselas</i>		
wings	present	absent
width	1.9-3.9 mm incl. wings	0.5-1.7(-2.2) mm
body colour	light to dark brown	black
ornamentation	shallow 8-10-sulcate	4-8-sulcate
ventral face shape	flat to strongly concave	convex
aristae width at base	0.10-0.15 mm	0.05-0.08 mm

TABLE 2. Morphological differences between *Bidens gledhillii* and *B. borianiana*.

	<i>B. gledhillii</i>	<i>B. borianiana</i>
<i>Life period</i>	perennial	annual
<i>Leaves</i>		
lamina dissection	deeply 1-2-pinnatipartite with 3-5(-7) segments, rarely undivided	tripartite, sometimes undivided
length	(0.8-)1.4-7.5 cm	(3.7-)4.3-23.5 cm
shape of undivided segments and lobes	narrowly linear-elliptic or narrowly linear-ovate to linear	narrowly ovate to narrowly elliptic
margin	entire	distantly serrate
<i>Capitula</i>		
diam. at anthesis	2.6-4.7 cm	(4.3-)5.8-9.6 cm
<i>Peduncles</i>		
length	to (5-)13-38 cm	to (3-)5-21 cm
<i>Outer phyllaries</i>		
no.	7-8(-9)	(7-)8-18(-26)
shape	broadest below middle; narrowly ovate to narrowly ovate-elliptic	broadest at middle; narrowly oblong or narrowly oblong-elliptic to linear
size at anthesis	4.6-8.1 × 1.5-2.4 mm	6.3-15.6 × 0.5-1.7 mm
length in fruit	unchanged	to 2.8 cm
no. of nerves	(1-)3-6	1-3
<i>Inner phyllaries</i>		
size in fruit	to 10.4 × 4.5 mm	to 16.1(-19.3) × 7.7 mm
<i>Ray florets</i>		
ray size	1.2-1.9 cm × 5.5-8.2 mm	(1.8-)2.7-5.3 cm × 8.0-19.2 mm
corolla tube length	1.6-2.7 mm	2.6-3.9 mm
corolla tube indumentum	glabrous	sparsely to subdensely pubescent

TABLE 2. Continued.

<i>Paleae</i>		
no. of nerves	5-21	2-8
colour of nerves	light to dark red-brown	light orange to orange-brown
<i>Disc florets</i>		
corolla length	3.8-6.3 mm	6.6-9.8(-10.1) mm
anther length	2.0-3.1 mm	2.8-4.0 mm
collar length	0.20-0.25 mm	0.30-0.35 mm
filament length	0.5-1.3(-1.6) mm	2.7-4.1(-4.8) mm
style branch length	1.1-1.6 mm	1.5-2.3 mm
<i>Cypselas</i>		
colour	light to dark brown	black
size	(3.8-)5.0-9.2 × 1.9-3.9 mm incl. wings	9.4-21.0 × 3.6-9.1 mm incl. wings
wing width and shape	0.15-1.30 mm, broadest at or slightly below middle, usually attenuated above	0.35-3.85 mm, broadest at or slightly below apex, attenuated below
aristae shape	trigonus	subulate

across Africa, chiefly in the Sudanian and Guineo-Congolian/Sudanian transition phytochoria (*sensu* White 1983). The primary cause of this failure to distinguish between these two taxa has been due to attempts to identify fragmentary herbarium specimens of *B. gledhillii* consisting only of the apical part of a stem or branch with immature or fruiting capitula. In such specimens only the atypical, often tripartite, apical leaves are present. These may be easily confused with those of *B. borianiana*, in which species they are characteristic. Secondly, the laterally bialate cypselas of *B. gledhillii* were previously only known for *B. borianiana* for those species of *Bidens* recorded for westernmost Africa. The latter species, however, occurs at lower altitude (210-1330 m) than *B. gledhillii*, and has only once been collected in Sierra Leone; from near Falaba, close to the border with Guinea. In addition, the two species may be distinguished by numerous morphological characters (see Table 2). *Bidens borianiana* is an annual with only a short, unbranched taproot. Its leaves are typically tripartite with distantly serrate margins, and its flowering capitula are frequently about twice as large (usually 5.8-9.6 cm diam.) and, as a consequence, their constituent parts frequently more numerous or larger than those of *B. gledhillii*. Further, the cypselial wings of *B. borianiana* are mostly much wider and characteristically broadest at or slightly below the apex, whereas in *B. gledhillii* they are broadest near the middle.

This species is named in honour of Dr. David Gledhill, joint collector of the type specimen and my early mentor in taxonomy. As an undergraduate I will always remember his kindness towards me and his enthusiasm for plants, especially those of Sierra Leone, which instilled in me a desire to study the African flora. It has been my good fortune to have encountered such a man in my informative years.

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