



The genus *Distephanus* (Asteraceae: Vernonieae) in southern Africa



N. Swelankomo^a, J.C. Manning^{b,c,*}

^a National Herbarium, South African National Biodiversity Institute, Private Bag X101, Pretoria 0001, South Africa

^b Compton Herbarium, South African National Biodiversity Institute, Private Bag X7, Claremont 7735, South Africa

^c Research Centre for Plant Growth and Development, School of Life Sciences, University of KwaZulu-Natal, Pietermaritzburg, Private Bag X01, Scottsville 3209, South Africa

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ABSTRACT

The southern African species of *Distephanus* Cass. (Asteraceae: Vernonieae) are revised. Full descriptions, illustrations, distribution maps and a key are provided for the five species recognised in the region.

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1. Introduction

The delimitation of the tribe *Vernonieae* Cass. has remained relatively unchanged since its description by *de Cassini* (1816) but the circumscription of the core genus *Vernonia* Schreb. has been drastically narrowed, from a maximum of some 1 000 out of 1 500 species included in the tribe to its current diminished size and distribution of just 22 species in North and South America (*Robinson, 1999a,b*). The immediate consequence of this has been the resurrection of many old genera and the description of a number of new ones to accommodate various groupings of species that are now segregated from the dismembered *Vernonia* in the broad sense. These segregates include all African members of the tribe, and *Vernonia* in the narrow sense is now restricted to the New World.

One of the earliest and most distinctive elements to be resurrected from *Vernonia* was the paleotropical genus *Distephanus* Cass., described by *de Cassini* (1817) for the single species *Conyza populifolia* Lam. from Mauritius, and named for the characteristic biseriolate pappus of 10 short outer scales alternating with 10 longer inner bristles. The genus was subsequently included in *Vernonia*, where it was treated at sectional or subsectional level until revived by *Robinson and Kahn* (1986) for 26 species of mostly western Indian Ocean and eastern African shrubs and scramblers. A more recent account estimates the number of species at ± 45 spp. (*Keeley and Robinson, 2009*). The genus is distinguished from other

Vernonieae by its trinervate leaves and mostly cream-coloured or yellow (rarely mauve to lilac) florets, neither character occurring elsewhere in the tribe, in which pinnate leaf venation and reddish to purple flowers are typical. Additional synapomorphies for *Distephanus* include simple, shield-like endothelial thickenings (*Robinson and Kahn, 1986*). The genus includes *Gongrothamnus* Steetz, which was similarly defined by its yellow flowers and trinervate leaves, as well as *Newtonia* O. Hoffm. It is currently included as the sole member of subtribe *Distephaninae* S.C. Keeley & H. Rob. (*Keeley and Robinson, 2009*).

Although most of the southern African species of *Distephanus* were treated (as *Vernonia*) by both Hilliard in her monograph *Compositae in Natal* and by *Pope* (1992) in *Flora zambesiaca*, no complete modern treatment of the species exists for the subcontinent. Since the transfer of four southern African species to *Distephanus* by *Robinson and Kahn* (1986), one additional combination has been made (*Boon and Glen, 2013*), and five species are now recognised in southern Africa.

We provide the first comprehensive treatment of the genus for southern Africa, with full nomenclature, descriptions, a key to the species, and distribution maps.

2. Materials and methods

Specimens or digital images of all relevant types were examined, as well as all herbarium material from BOL, NBG, PRE and SAM, the primary collections of species from southern Africa (herbarium acronyms according to *Holmgren et al., 1990*).

* Corresponding author.

E-mail address: J.Manning@sanbi.org.za (J.C. Manning).

3. Taxonomy

3.1. Genus description

***Distephanus* Cass.** in Bull. Sci. Soc. Philom. Paris 1817: 151 (1817). *Vernonia* sect. *Distephanus* (Cass.) Benth. & Hook.f., Gen. Pl. 2(1): 228 (1873). *Vernonia* subsect. *Distephanus* (Cass.) S.B. Jones in Rhodora 83: 68 (1981). Type: *Distephanus populifolius* (Lam.) Cass.

Gongrothamnus Steetz in Naturw. Reise Mossambique [Peters] 6(Bot., 2): 336 (1864). *Vernonia* subsect. *Gongrothamnus* (Steetz) S.B. Jones in Rhodora 83: 65 (1981). Type: *Gongrothamnus divaricatus* Steetz = *Distephanus divaricatus* (Steetz) H. Rob. & B. Kahn.

Newtonia O. Hoffm. in Nat. Pflanzenfam. [Engler & Prantl] 4(5): 285 (1892), illegitimate name, not *Newtonia* Baill. in Bull. Mens.

Soc. Linn. Paris 1: 721 (1888). *Antunesia* O. Hoffm. in Bol. Soc. Brot. 10: 178 (1893), as a replacement name for *Newtonia* O. Hoffm., nom illegit. Type: *Newtonia angolensis* O. Hoffm. = *Distephanus angolensis* (O. Hoffm.) H. Rob. & B. Kahn.

Shrubs or scramblers. Leaves alternate or rarely opposite, shortly petiolate, blade ovate to lanceolate, usually trinervate, acuminate, margins entire or undulate-serrate, glabrous to thinly hairy and glandular. Capitula in terminal, corymbose panicles, homogamous, discoid. Involucre campanulate, bracts in several series, imbricate, lanceolate, ± pubescent. Receptacle epaleate. Corolla usually yellow to creamy-white or orange-yellow, less commonly lilac or mauve, funnel shaped, glandular in upper part, 5-lobed, lobes recurved apically. Anthers sagittate, apical appendages without glands. Style branches linear, acute, with relatively long hairs on back. Cypselas oblong-obovoid, 5- to 10-ribbed, glabrous or pilose-sericeous.



Fig. 1. *Distephanus anisochaetoides*, Ross 2393 (PRE).



Fig. 2. Inflorescence details of *Distephanus anisochaetoides*, Ross 2393 (PRE). Scale bar: 5 mm.

Pappus biseriate, of 10 or more shorter, linear scales alternating with 10 or more inner barbellate bristles. *Pollen*: tricolporate, echinate to subechinolate [Type A *vide* Jones (1981)].

45 spp., tropical and subtropical Africa, with 5 spp. in southern Africa.

Etymology: From the Greek *di* = two and *stephanus* = crowned, alluding to the biseriate pappus of scales and bristles.

3.2. Key to southern African species

1a Involucral bracts acute to apiculate; flowers yellow or orange fading yellow; plants from northwestern and northern and inland parts of southern Africa.

2a Leaves discolorous, upper surface dark green and thinly puberulous, lower surface whitish-felted; florets 15 to 20 per capitulum, orange fading yellow, corolla 8–10 mm long... 4. *D. divaricatus*.

2b Leaves concolorous, glabrescent, yellowish green; florets 3 to 5 per capitulum, yellow, corolla 4–6 mm long... 5. *D. angolensis*.

1b Involucral bracts acute to obtuse; florets whitish to mauve; plants from eastern coastal parts of southern Africa: 3a Leaves usually opposite, deltoid-ovate or rhombic to hastiform; inner involucral bracts 4–6 mm long; cypselas 5-ribbed; pappus bristles white, acute, 5–6 mm long... 3. *D. angulifolius*.

3b Leaves alternate, obovate or ovate to cuneate-rhomboid; inner involucral bracts 3.0–3.5 mm long; cypselas 8- to 10-ribbed: 4a Leaves broadly obovate to cuneate-rhomboid with cuneate base; inflorescence laxly paniculate, branches stiffly divaricate and flexuose; florets \pm 15 to 20 per capitulum; pappus bristles buff, clavate, 4 mm long... 1. *D. anisochaetoides*

4b Leaves ovate to elliptic with broadly cuneate or rounded base; inflorescence densely paniculate, branches not strongly flexuose; florets \pm 9 per capitulum; pappus bristles white, acute, 4–6 mm long... 2. *D. inhacensis*

3.3. Species treatment

3.3.1. *D. anisochaetoides*

(Sond.) H. Rob. & B. Kahn in Proc. Biol. Soc. Washington 99(3): 499 (1986). *Vernonia anisochaetoides* Sond. in *Linnaea* 23: 61 (1850). Syntypes: South Africa, [Kwazulu-Natal], 'Port Natal' [Durban], *Gueinzus* 591 (G, syn.), *Gueinzus* 320 (MEL, syn.—digital image!).

Scandent shrub or semi-climber to 3 m; stem ribbed, greyish, densely felted when young with shaggy hairs concealing large, sessile glands, glabrescent. *Leaves* alternate, broadly obovate to cuneate-rhomboid, (20–)30–70 \times 10–35 mm, margins entire or

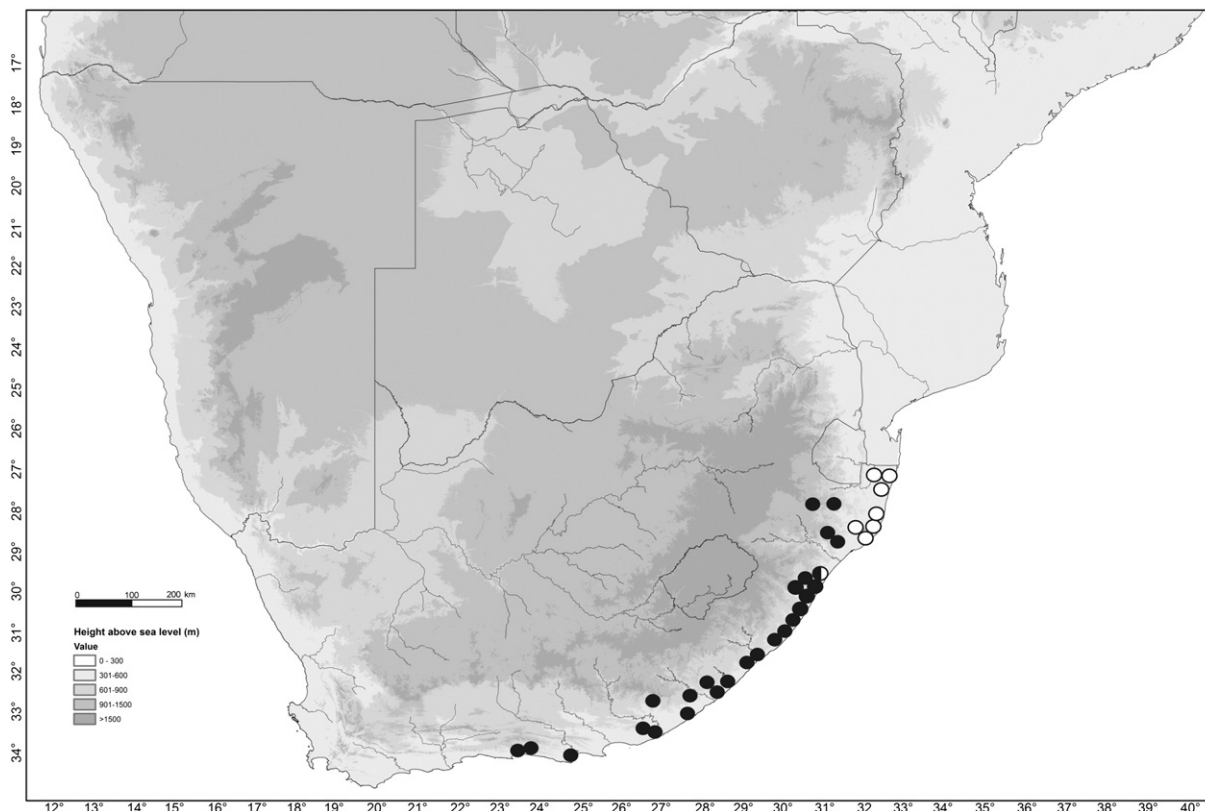


Fig. 3. Distribution of *Distephanus anisochaetoides*, ●; and distribution in southern Africa of *D. inhacensis*, ○.

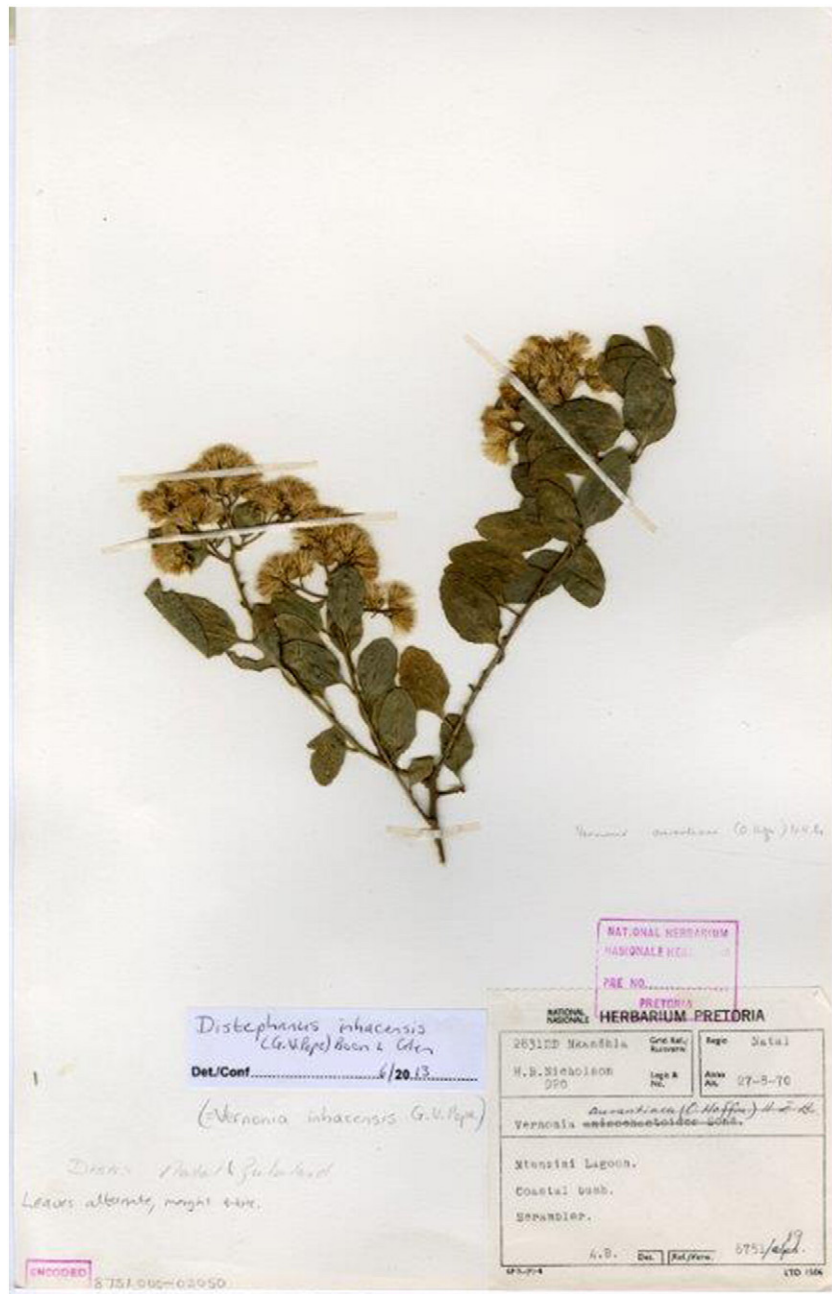


Fig. 4. *Distephanus inhacensis*, Nicholson 920 (PRE).

irregularly coarsely toothed in distal half, 3(5)-nerved from base, acute to acuminate, base narrowed, felted when young, glabrescent, conspicuously gland-pitted beneath, petiole 5–15 mm long. *Capitula* in cymose panicles in upper axils on rigidly divaricate, flexuous branches, ± 15 (to 20)-flowered. *Involucre* campanulate, 4–5 mm diam., bracts 3- or 4-seriate, imbricate, felted and with large, sessile glands, acute, margins membranous, ciliate, outer bracts ovate, ± 1.5 mm long, inner elliptic-lanceolate, ± 3 mm long, 3-veined. *Florets* whitish or buff, pale mauve to creamy-white, 3–4 mm long, corolla tube narrowly funnel-shaped, lobes linear, recurved, ± 1.5 mm long. *Anthers* sagittate. *Style* up to 5 mm long, pilose or shortly hirsute distally and on branches, branches ± 1 mm long. *Cypselas* cylindrical, 8- to 10-ribbed, 1.5–2.0 mm long, sparsely hairy and with large, sessile glands; pappus biseriate, buff, scales 0.5–0.8 mm long, bristles ± 4 mm long, clavate. *Flowering time*: (Mar–)Jul–Sept (Figs. 1, 2).

Distribution and habitat. Endemic to the eastern seaboard of South Africa, ranging from Knysna in Western Cape northwards through the coastal parts of Eastern Cape and KwaZulu-Natal to Stanger in the north, extending inland to Richmond and Bulwer in south-central KwaZulu-Natal and to the Ngome and Nkandla forests in northern KwaZulu-Natal (Fig. 3), scrambling or climbing along the margins of temperate forest and coastal bush, from sea level 1 518 m asl.

Diagnosis. A distinctive species recognised by the stiffly divaricate, more or less flexuous or zig-zag, inflorescence branches, more or less obovate leaves with large sessile glands on both surfaces, small capitula with inner bracts ± 3 mm long, and unusual, clavate inner pappus bristles.

Additional specimens seen. KWAZULU-NATAL.—2730 (Vryheid): Vryheid, (– DD), Aug 1921, Rogers 24352 (PRE). 2731 (Louwsburg):



Fig. 5. Inflorescence details of *Distephanus in hacensis*, Nicholson 920 (PRE). Scale bar: 5 mm.

Ngome Forest, (–CD), 27 Jul 1944, *Gerstner 4847* (PRE). **2831 (Nkandla)**: Nkandla Forest, (–CA), 6 May 1948, *Gerstner 6808* (PRE); Eshowe, (–CD), Jul 1937, *Gerstner 3032* (NBG, PRE); Ngoye Forest (–CD), 26 Jul 1960, *Ward 3460* (PRE, NH); 12 Oct 1984, *Lowrey & van Wyk 10445* (NH); 20 Jul 1993, *Williams 1063* (PRE). **2930 (Pietmaritzburg)**: Richmond, south east of Mid-Illovo, Ismont, (–CD), 9 Aug 1970, *Hilliard 5066* (NH); Inanda Mission Reserve 4579, Thelezi Forest, (–DB), 16 Jul 1992, *Ward 12101* (NH); Inanda, (–DB), 11 Aug 1939, *Gerstner 3397* (NH); Pinetown, (–DD), 11 Mar 1967, *Coleman 398* (PRE); Krantzkloof, (–DD), Sept 1921, *Rogers 24418* (PRE). **2931 (Stanger)**: Verulam, (–CA), 7 Aug 1896, *Wood 6141* (PRE); 14 Sept 1965, *Moll 2034* (PRE); Umhlanga River, Havaan Forest, (–CA), 2 Aug 1970, *Ross 2393* (PRE); Umhlanga Rocks Area, “Forest 31”, west of route MR 398, (–CA), 3 Nov 1994, *Ward 12747* (NH); Durban, (–CC), Sept 1890, *Thode s.n.* (NBG); Sept. 1905, *Marloth 4173* (PRE); Sept 1915, *Rogers 1468* (PRE); Stella Bush, (–CC), 18 Aug 1918 [without collector] (SAM). **3030 (Port Shepstone)**: Umzinto, Umtwalumi, (–BC), 10 Jul 1964, *Bourquin PRE 44280* (PRE); Umdoni Park, (–BC), 17 Jul 1970, *Nicholson 885* (PRE); Port Shepstone, Shelley Beach, (–CB), 9 Sept 1967, *Strey 7675* (PRE); Oribi Gorge Nature Reserve, (–CB), 23 Aug 1981, *Van Wyk 4518* (PRE); Thuthwini, Ntimbankulu/Dweshula village near foot path through Ntimbankulu Forest to Mabhelani Village, (–CB), 24 May 200, *Ngwenya 2335* (NH); Oribi Gorge Nature Reserve, (–CC), 8 Oct 1984, *van Wyk & Lowrey 6789* (NH). **3130 (Port Edward)**: Umtamvuna Nature Reserve, (–AA), 1 Aug 1985, *Abbott 2692* (NH).

EASTERN CAPE.—**3129 (Port St. Johns)**: Umtakatyi River, north of Libode, (–CC), 16 Sept 1947, *Acoccks 13811* (PRE); Port St. Johns, (–DA), Aug 1971, *O’Grady J41649* (PRE). **3226 (Fort Beaufort)**: Seymour, Hogsback; Auckland Forest, (–DB), 14 Aug 1943, *Giffen G847* (PRE). **3227 (Stutterheim)**: Komgha, (–DB), Aug 1891, *Flanagan 269* (PRE); Komgha, 32 miles [51.2 km] from East London on Butterworth Road, (–DB), 18 Jul 1976, *Acoccks 1241* (PRE). **3228 (Butterworth)**: Kentani, Nomaheye, (–AA), 12 Jul 1966, *Strey 6710* (PRE); Kentani, (–AD), 3 Aug 1904, *Pegler 1113* (PRE); Willowvale, Qora Mouth, (–BC), 15 Jul 1956, *Meeuse 9682* (PRE); Kei Mouth, (–CB), Aug 1891, *Flanagan 269* (NBG, SAM). **3323 (Willowmore)**: Knysna, Nature’s Valley, (–DC), 7 Jul 1960, *Acoccks 21161* (PRE); 28 Jul 1973, *Bayliss 5800* (NBG). **3326 (Grahamstown)**: Grahamstown, (–BC), Jul [without

year], *MacOwan 1228* (PRE); Alexandria, Olifantshoek Forest, (–CB), 14 Aug 1952, *Archibald 4433* (PRE). **3327 (Pieddie)**: East London, (–BB), Aug 1888, *Thode s.n.* (PRE, SAM); Jul 1923, *Munro TRV 23176* (PRE); East London, Buffalo Pass, 8.8 miles [14.08 km] from East London via Collondale, (–BB), 25 Jul 1955, *Comins 1295* (PRE); East London, Quigney, (–BB), Aug 1896, *Galpin 3305* (PRE). **3424 (Humansdorp)**: Storms River Mouth, (–BB), 2 Aug 1920, *Keet 547* (NBG, PRE).

3.3.2. *D. in hacensis*

(*G.V. Pope*) *Boon & Glen* in *Bothalia* 43: 94 (2013). *Vernonia in hacensis* *G.V. Pope* in *Kew Bull.* 43: 280 (1988). Type: Mozambique, Xai-Xai, Praia Sepulveda, *Barbosa & Lemos 7843* (K, holo.—ALUKA image!; COI—ALUKA image!, LISC—ALUKA image!, iso.).

[*Vernonia aurantiaca* sensu *Hilliard* (1977)].

Scrambling or climbing shrub, up to 8 m; stem ribbed, puberulous and glandular, glabrescent. *Leaves* alternate, ovate to elliptic, 15–60 × 8–35 mm, 3-nerved from base, margins entire, often ± revolute, glabrous or puberulous and glabrescent or obscurely gland-pitted beneath, subacute to obtuse, base broadly cuneate or rounded, petiole up to 8 mm long. *Capitula* terminal on short leafy twigs or forming cymose panicles, ± 9-flowered. *Involucre* obconic-campanulate, 3–4 mm diam., bracts ± 4-seriate, imbricate, puberulous, margins membranous, ciliate, outer bracts narrowly triangular, ± 3 mm long, inner linear-lanceolate, 3–4 mm long, acute. *Florets* white to creamy white, 5–7 mm long, corolla tube funnel-shaped, lobes linear-oblong, 1.5–2.0 mm long. *Anthems* sagittate, 2 mm long. *Style* up to 4 mm long, pilose or shortly hirsute distally and on branches, branches ± 2 mm long. *Cypselas* subcylindric, 8- to 10-ribbed, 2.0–2.5 mm long, sparsely hairy; pappus biseriate, buff, scales 0.5–0.8 mm long, bristles 4–6 mm long, acute. *Flowering time*: Jul–Oct. (Figs. 4, 5).

Distribution and habitat. *D. in hacensis* is a coastal species recorded from Zimbali Dune Forest northwards along the KwaZulu-Natal coast to Maputo in southern Mozambique (Fig. 3), scrambling or climbing in coastal bush and forest up to 50 m asl. Plants growing on coastal dunes have glabrous, slightly succulent leaves compared with those from slightly inland.

Diagnosis. Resembling *D. anisochaetoides* in its alternate, ± concolorous leaves and white to cream-coloured florets but distinguished from that species by the leaves ± abruptly narrowed (vs ± cuneate) to the petiole, the densely paniculate cymes with ± straight (vs flexuous) inflorescence branches, and the fewer (± 9 vs ± 15 to 20) florets per capitulum. In addition, *D. anisochaetoides* has unusual, clavate pappus bristles.

Additional specimens seen. KWAZULU-NATAL.—**2732 (Ubombo)**: Ingwavuma Tembe Elephant Park, margin of forest, (–AB), 17 Aug 1985, *Ward 1009* (PRE); Maputaland, Sileza Forest Reserve, sand forest East side of Gondetembe Pan. (–BA), 21 Oct 1994, *Van Wyk 12399* (PRE); Maputaland, Lake Sibaya, abandoned camp, (–BC), 4 Sept 1996, *Felton & Thornhill 143* (PRE); Ubombo, Manzingwenya, (–BC), 11 Sept 1971, *Strey 10454* (PRE); Ubombo, Sordwana Bay, (–DA), 17 Sept 1965, *Vahrmeijer 1157* (PRE); between Jozini & Sordwana Bay, (–DA), 5 Sept 1964, *Van der Schijff 6589* (PRE); Sordwana Bay, (–DA), 5 Sept 1982, *Kluge 2529* (PRE). **2831 (Nkandla)**: Umhlatuzi Lake, (–DC), 11 Jul 1967, *Venter 3851* (PRE); Mtunzini Lagoon, (–DD), 27 Aug 1970, *Nicholson 920* (PRE). **2832 (Mtubatuba)**: St. Lucia, False Bay, (–AB), 26 Aug 1978, *Curator Pretoria Botanical Garden 1781* (PRE); Futululu, Dukuduku, (–AC), 9 Sept 1971, *Strey 10412* (PRE); Mapelana, margin of dune forest, (–AD), 24 Sept 1971, *Ward 7214* (PRE). **2931 (Stanger)**: Ballitoville, Zimbali Dune Forest, scrambling over foredune scrub (–CA), 5 Sept 1985, *MacDevette 317* (PRE).



Fig. 6. *Distephanus angulifolius*, Codd 1503 (PRE).

3.3.3. *D. angulifolius*

(DC.) H. Rob. & B. Kahn in Proc. Biol. Soc. Washington 99(3): 499 (1986). *Vernonia angulifolia* DC., Prodr. 5: 29 (1836). Type: South Africa, [Eastern Cape], near the Umzimvubu [Mzimvubu] River, Drège 5033 (G-DC, holo.—microfiche!).

Scandent shrub or semi-climber, 1–6 m tall; stem ribbed, densely or more sparsely appressed pubescent when young, glabrescent, glandular. Leaves usually opposite or subopposite, rarely alternate, deltoid-ovate or rhombic to hastiform, (10–)20–50 × (10–)15–40 mm, strongly 3-nerved from base, margins coarsely or sinuous-toothed, rarely entire, subacute to obtuse, base cuneate, decurrent on petiole, appressed puberulous and conspicuously gland-pitted, glabrescent,

drying dark above and paler beneath, petiole 5–10 mm long. Capitula in cymose panicles on weakly ascending branches in upper axils, sweetly scented, ± 10-flowered. Involucre campanulate, 4–5 mm diam., bracts 3- or 4-seriate, imbricate, thinly villous and glandular with membranous margins, ciliate, outer bracts narrowly ovate, acute, 2–3 mm long, inner elliptic-lanceolate, obtuse, 4–6 mm long, 3-veined. Florets pale mauve, lilac or pale pink to creamy white, 5.0–6.5 mm long, corolla tube narrowly funnel-shaped, lobes linear, up to 3 mm long. Anthers sagittate, ± 2 mm long. Style up to 7 mm long, branches, ± 3 mm long, pubescent on back. Cypselas narrowly turbinate, sharply 5-ribbed, 1.5–2.5 mm long, pilose and glandular; pappus biseriate, white, scales ± 0.8 mm long,



Fig. 7. Inflorescence details of *Distephanus angulifolius*, Codd 1503 (PRE). Scale bar: 5 mm.

bristles ± 5 mm long, acute. Flowering time: May–Jul (– Aug). (Figs. 6, 7).

Distribution and habitat. Restricted to the eastern seaboard of southern Africa, from Port St Johns in Eastern Cape northwards along the KwaZulu-Natal coast extending inland to Pietermaritzburg and reaching to Maputo in southern Mozambique (Fig. 8), as a common

component of dune and coastal forests, mainly on the margins and along paths and roadsides, in sand or sandy-loam soils, usually below 800 m.

Diagnosis. *D. angulifolius* is usually readily distinguished from other southern African species by its opposite or subopposite (rarely alternate) leaves with deltoid-ovate and sinuate-dentate or hastiform blade. The leaves and young stems are roughly pubescent with \pm appressed eglandular hairs and sessile glands. The 5-ribbed cypselas with slender, white pappus bristles are also characteristic.

Occasional specimens with alternate, entire leaves may be confused with the slightly later-flowering *D. anisochaetoides* where the two co-occur around Durban but that species has the young leaves and stems whitish felted with shaggy, eglandular hairs that persist on the older stems as a tissue-paper like indumentum between the ribs, exposing the prominent, sessile glands; stiffly divaricate and \pm flexuous or zig-zag inflorescence branches; capitula with shorter inner bracts ± 3 mm long, and more numerous, ± 15 florets; and 8- to 10-ribbed cypselas with a buff pappus with the inner bristles \pm clavate.

Additional specimens seen. MOZAMBIQUE.—**2632 (Bela Vista):** Maputo, 12 km from Ponta do Ouro to Zitundo, (– DD), 7 Jul 1973, *Correia & Marques 2934* (NMG, SAM).

KWAZULU-NATAL.—**2732 (Ubombo):** Vazi Swamp, (– BB), Oct 1972, *Stephen, Van Graan & Schwabe 1221* (PRE); 3 km from Mbazwane to Sordwana, (– BC), Oct 1972, *Stephen, Van Graan & Schwabe 1073* (PRE); Sibaya Lake, (– BC), 14 Jun 1983, *Ward 465* (NH); Muzi, Mbazwana Stream, (– CB), 14 Jun 1986, *van Wyk 776* (NH); Sordwana State Forest, (– DA), 21 May 1984, *MacDevette 539* (NH). **2831 (Nkandla):** Eshowe, Umhlatuzi swamp, (– DC), Jul 1926, *Kotze 51* (PRE). **2832 (Mtubatuba):** Hlabisa, near Redmans Camp in bird sanctuary bushveld-reserve of False Bay, (– AB), 27 Jun 1944, *Gerstner 4765* (PRE); Nyalazi State Forest, (– AB), 3 Sept 1984, *van Wyk 444* (NH);

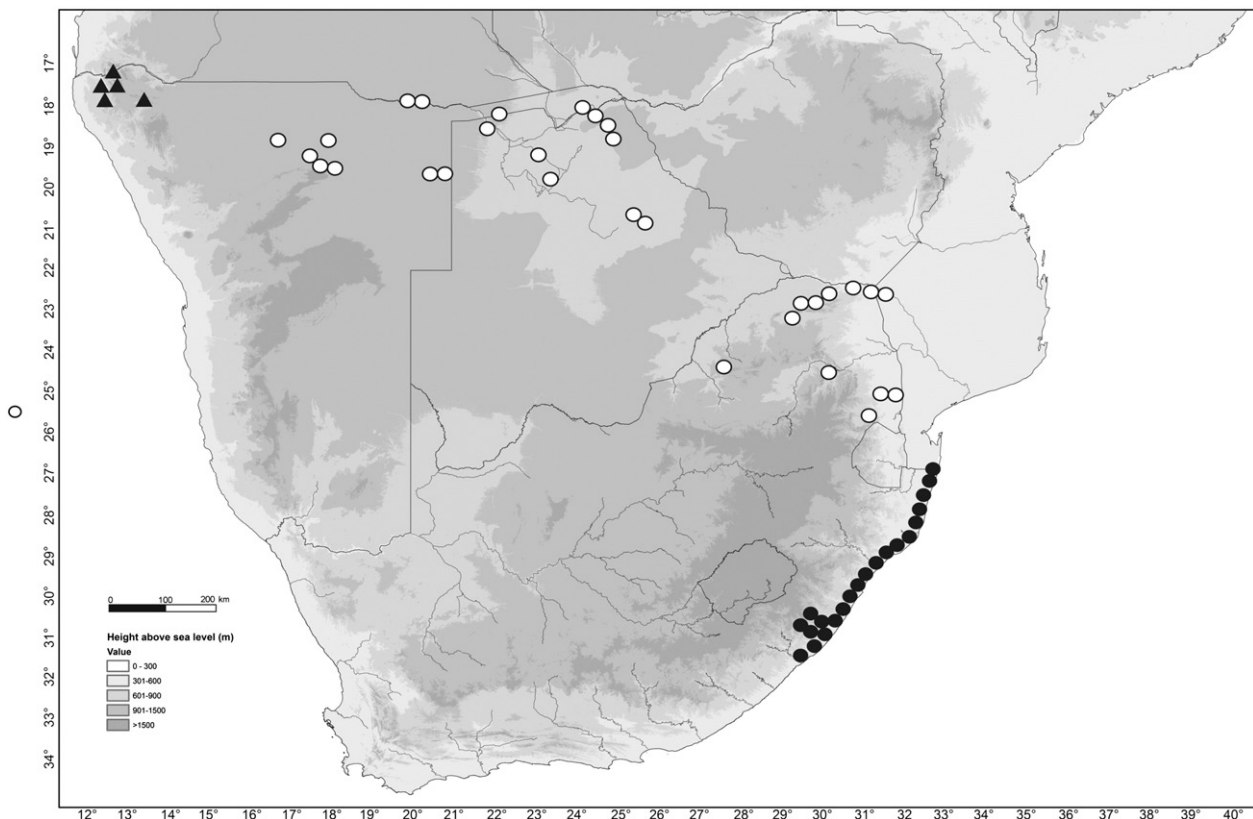


Fig. 8. Distribution in southern Africa of *Distephanus angulifolius*, ●; *D. divaricatus*, ○; and *D. angolensis*, ▲.



Fig. 9. *Distephanus divaricatus*, van Graan & Hardy 533 (PRE).

Dukuduku, (– AC), 23 Jul 1967, *Strey* 7592 (PRE, NH); St. Lucia, (– AD), 11 Jul 1951, *Louw* 1925 (NBG, SAM); St. Lucia Estuary, (– AD), 26 Jun 1961, *Ward* 3657 (PRE); Kwa-Mbonambi, Dukuduku Area, (– CA), Aug 1982, *Dally* 16 (NH); Umhlatuzi Lake, (– CC), 20 May 1968, *Venter* 4748 (PRE); Richards Bay, (– CC), Jul 1945, *Smith s.n.* (PRE). **2930 (Pietermaritzburg)**: Natal Botanic Garden, grassland adjacent to forest, (– CB), 22 May 1975, *Law* 55 (NBG); Table Mountain, (– DA), 24 Apr 1948, *Killick* 134 (PRE); Hammarsdale Area, Hector (Eskom) substation site, (– DC), 2 Jun 1995, *Ward* 13185 (NH); Isipingo, (– DD), 12 Jul 1918, *Moss* 2510 (PRE); 19 May 1921, *Forbes s.n.* (SAM); Krantzklouf, (– DD), Jun 1921, *Haygarth* 166 (NBG). **2931 (Stanger)**: Ballito District, ± 5–7 km west of Shakaskraal (Route P104), (– AC), 9 Oct 2001, *Meyer* 3895 (PRE); Groutville, (– AD), Aug 1921, *Haygarth* 23207 (PRE); Amatikulu Nature Reserve, (– BA), 26 Jun 1984, *Ward*

737 (NH); Umdlotti Beach, 20 miles [16 km] north of Durban, (– CA), 2 Jul 1946, *Codd* 1503 (PRE); Umhlanga River, Hawaan Forest, (– CA), 2 Aug 1970, *Ross* 2391 (PRE, NH); Umhlanga Rocks, Hawaan Forest, (– CA), 21 Jun 1966, *Moll* 3280 (PRE); Umhlanga, (– CA), Jul 1944, *Fischer* 698 (NH) Hawaan Forest (– CA), Mar 1976, *Onderstall* 60 (PRE); Isipingo, (– CC), 19 May 1921, *Forbes s.n.* (NBG); Jul 1935, *Forbes & Obermeyer* 13 (PRE); Montclare, (– CC), 16 Jul 1945, *Barker* 3580 (NBG); Durban, edge of bush, (– CC), May 1890, *Thode s.n.* (NBG, SAM); Umgeni, (– CC), Jul 1890, *Thode s.n.* (SAM); Durban, (– CC), 22 Jul 1918, *Moss* 2509 (PRE); Port Natal [Durban], (– CC), 1840, *Krauss* 223 (PRE); Bluff, (– CC), 11 Aug 1936, *Ogilvie* 1 (NH); Montclair, (– CC), 16 Jul 1945, *Compton* 3580 (SAM). **3030 (Port Shepstone)**: Umgay flats [Umgai], (– BC), 3 Jun 1908, *Rudatis* 410 (SAM); Umgai, (– BC), 23 Jun 1972, *Strey* 10971 (PRE, NH); Umzinto, (– BC), 28 Jul



Fig. 10. Inflorescence details of *Distephanus divaricatus*, van Graan & Hardy 533 (PRE). Scale bar: 5 mm.

1963, *Strey* 4822 (NH); Port Shepstone, Umzimkulwana gorge, halfway up the slopes of gorge on lower road to Oribi Flats, (–CB), 21 Jun 1943, *West* 2010 (PRE); Thuthwini, Ntmbankulu/Dweshula Village, (–CB), 22 May 2001, *Ngwenya* 2296 (NH); Oribi Gorge, (–CB), 3 Jul 1936, *Britten* 6542 (PRE); Oribi Gorge, road from entrance about half way to Oribi River, (–CB), 17 Sept 1996, *Bayer & Puttock* SAF-96220 (NBG, PRE); Umtamvuna Nature Reserve, Goyosa Kloof Junction, (–CC), 7 May 1983, *Abbott* 1096 (NH); Port Shepstone, Uvongo, (–CD), 15 Dec 1936, *Mogg* 13229 (PRE); 3 July 1997, *von Fintel* 554 (NH). **3130 (Port Edward)**: Umtamvuna River; edge of forest, overlooking river, (–AA), 31 Oct 1974, *Nicholson* 1516 (PRE).

EASTERN CAPE.—**3129 (Port St. Johns)**: Lusikisiki near Gemvale Store, (–BC), 29 July 1946, *Acocks* 12831 (PRE); Port St. Johns, (–DA), Dec 1950, *Isaac* PRE 44308 (PRE); Port St. Johns, Second Beach, (–DA), 21 Jul 1975, *Bayliss* 1513 (PRE).

3.3.4. *D. divaricatus*

(Steetz) H. Rob & B. Kahn in Proc. Biol. Soc. Washington 99(3): 499 (1986). *G. divaricatus* Steetz in Naturw. Reise Mossambique [Peters] 6(Bot., 2): 342 (1864). *Vernonia vitellina* N.E.Br. in Kew Bull. 1909: 116 [also 117] (1909), as a replacement name, not *V. divaricata* Sw. in Fl. Ind. Occid. 3: 1319 (1806). Type: Mozambique, Inhambane, *Peters* (B†, holo.). Neotype: Mozambique, [Maputo], Moambe to Magude, 2 May 1944, *Torre* 6546 (PRE, neo.), designated here; LISC, isoneo.).

Gongrothamnus aurantiacus. O. Hoffm. in Bot. Jahrb. 30: 433 (1902). *Vernonia aurantiaca* (O. Hoffm.) N.E.Br. in Kew Bull. 1909: 116 (1909). Type: Tanganyika, Usafura, Songwe Valley, *Goetze* 1056 (E, holo.—ALUKA image!; K—ALUKA image!, P—ALUKA image!, iso.).

Gongrothamnus corradianus. Cufod. in Nuovo Giorn. Bot. Ital. n. s. l: 111 (1943). Syntypes: Ethiopia, Rive del Caschei, *Corradi* 1779, 1910, 2098, 2106 (FT—ALUKA images!, syn.); Rive del Ghizo, *Corradi* 2090, 2091, 2092, 2093 (FT—ALUKA images!, syn.); Rive del Seghido, *Corradi* 2127 (FT—ALUKA image!, syn.).

Spawling or scandent shrub or semi-climber, 1–8 m; stem angled or weakly ribbed, densely felted when young with ± appressed, shaggy hairs and sessile glands, glabrescent. *Leaves* alternate, broadly ovate to

lanceolate, 15–70 × 5–40 mm, 3-nerved from base, acuminate, base cuneate and shortly decurrent on petiole or abruptly cuneate, margins entire or weakly and distantly serrate, discolorous, upper surface green and felted- puberulous, lower surface densely whitish-felted with shorter, erect hairs mainly on veins and margins, and sessile glands, petiole 5–20 mm long. *Capitula* in globose clusters on divaricate branches in upper axils, forming cymose panicles, 15- to 20-flowered, sweetly scented. *Involucre* campanulate or obconic, 4–5 mm diam., bracts ± 4-seriate, imbricate, thinly pubescent or subglabrous, margins membranous, ciliate, outer bracts lanceolate, acuminate-apiculate, ± 3 mm long, inner oblong-lanceolate, 4–5 mm long, acuminate, 3-veined. *Florets* orange-yellow, 6–7 mm long, corolla tube narrowly funnel shaped, lobes linear, recurved, ± 2 mm long. *Anthers* sagittate, ± 2 mm long. *Style* up to 7 mm long, pilose or shortly hirsute distally and on branches, branches ± 2 mm long. *Cypselas* narrowly obovoid to cylindrical, angled or 6- to 10-ribbed, 1.5–2.5 mm long, silky with sessile glands; pappus biseriate, buff, scales 0.5–0.8 mm long, bristles 6–7 mm long, acute. *Flowering time*: Jun–Jul. (Figs. 9, 10).

Distribution and habitat. Widespread throughout tropical and subtropical Africa as far north as Ethiopia, extending into the northern parts of southern Africa as far as Grootfontein in Namibia and Maun in Botswana, and in South Africa from the Waterberg in Limpopo to Komatipoort in Mpumalanga (Fig. 8), scrambling or climbing in deciduous woodland and riverine bush.

Diagnosis. Readily recognised by the ± acuminate, discolorous leaves, sparsely puberulous above and whitish felted beneath, the acuminate-apiculate involucre bracts, and the relatively large, orange-yellow florets with corolla 8–10 mm long.

Additional specimens seen. NAMIBIA.—**1719 (Rundu)**: Runtu, west bank of Okavango River, (–DD), 13 Jul 1952, *Maguire* 1608 (NBG, PRE, SAM). **1720 (Sambio)**: Community forest 40 km from Mkwasi camp on road to Bagani, (–CC), 23 May 1999, *Austaller, Mannheimer, Klaassen, & Curtis* SA9 (PRE). **1816 (Namutoni)**: Etosha Pan National Park, south boundary opposite Hestria, (–DC), 14 Ma 1974, *Le Roux* 987 (PRE). **1818 (Tsumeb)**: Tsumeb, Last Hope close to Tsintsabis next to Agriculture Field, (–CC), 5 May 2000, *Friederich* 2/37 (PRE). **1822 (Kangara)**: Western Caprivi Strip midway on south boundary, (–AA), May 1966, *Tinley* 1470 (PRE). **1824 (Kachikau)**: Shaile; Caprivi-Botswana Border 2.5 km east of Shaile Camp, (–AA), Feb 1923, *Dinter* 4504 (PRE). **1917 (Tsumeb)**: Tsumeb, (–BA), May 1934, *Nagelsbach* TRV 32800 (PRE); Grootfontein, Tsumeb, (–BA), 22 Apr 1934, *Dinter* 7256 (PRE); Tsumeb, near Tsumeb, (–BA), 4 May 1954, *Marsh* PRE 41436 (PRE); Border Farm Hurisib 533–Farm St Hubertus 534, (–BD), May 1998, *Hilbert* HIL 079 (PRE). **1918 (Grootfontein)**: Kumkauas Farm, (–CA), 31 Mar 1953, *Kings* 2870 (PRE); Grootfontein, (–CA), 25 Jul 1933, *Schoenfelder* S129 (PRE). **1920 (Tsumkwe)**: east of Tsumkwe towards Makari, (–DA), 27 May 1997, *Strohbach* 3543 (PRE); Grootfontein North, Kaokoveld, Ahaberge, (–DB), 17 Apr 1967, *Giess* 9890 (PRE); Kaokoveld; Aha Mountains, 18 miles [28.8 km] south of Tsumkwe Road, (–DB), 16 Apr 1967, *Giess* 9668 (PRE). **1923 (Maun)**: Northern Dist., Dindinga Island, (–AA), 5 Jun 1973, *Smith* 612 (PRE).

BOTSWANA.—**1724 (Katima Mulilo)**: Kabulabula; Chobe River, (–DD), Jul 1930, *Van Son* TRV 28720 (PRE); Kabulabula, near Chobe River, (–DD), Jul 1930, *Van Son* TRV 28720 (PRE). **1821 (Andara)**: Ngamiland; Tsodilo Hills, slopes of Mt Female Hill, (–DB), 13 Jul 1963, *Banks* 9 (PRE); 2 May 1975, *Müller & Biegel* 2306 (PRE). **1824 (Kachikau)**: Kachikau, 5 miles east of town, (–AB), 26 May 1954, *Munro* ML 11 (PRE); Chobe, Serondela, (–BC), Jun 1950, *Miller* B/1060 (PRE); Chobe, Serondela, (–BC), Jun 1950, *Miller* B/1059 (PRE). **1923 (Maun)**: Ngamiland, Moremi Wildlife Reserve, (–AA), Dec 1965, *Lent* 37 (PRE); 18 miles [28.8 km] south west of Maun, (–CD), 6 May 1967, *Lambrecht* 180 (PRE). **2025 (Mumpswe)**: Makarikari Game Reserve, (–DA),



Fig. 11. *Distephanus angolensis*, Meyer 1288 (PRE).

19 Jul 1984, *Jacobsen 3406* (PRE). **2127 (Francistown)**: Pikwe, (–DD), Apr 1978, *Kerfoot & Falconer 143* (PRE).

LIMPOPO.—**2229 (Waterpoort)**: Van Collers Pass, Waterpoort on top of pass, (–DC), 30 May 1976, *Burger 356* (PRE); Zoutpansberg, Wylie's Poort P.O. near Wylliespoort, (–DD), 12 Jul 1948, *MacKay PRE 41463* (PRE); Johanna Uys Nature Reserve, (–DD), 14 May 1973, *Van Graan & Hardy 533* (PRE). **2230 (Messina)**: Mukoma Village, on old road to Tshikondeni Mine, (–BD), 29 Jun 2004, *Van Wyk, Mukoma & Nkuna 839* (PRE); Savhe, near the road, (–DA), 3 Dec 1979, *Netshiungani 1053* (PRE); road between Thengwe and Muswodi, (–DA), 20 Sept 2000, *Van Wyk 124* (PRE). **2231 (Pafuri)**: Kruger National Park, Pafuri, (–AD), 7 Jul 1960, *Brynard & Pienaar 4489* (PRE); Kruger National Park, south-east of Klopperfontein, (–CA), 29 Apr 1953, *Van der Schijff 2923* (PRE); 11 miles [17.6 km] south-west of

Punda Maria Camp, (–CA), 6 Jun 1948, *Codd 4208* (PRE); 3–4 km from Punda Maria on Louis Trichardt road, (–CA), 24 Jun 1999, *Stephen 1901* (PRE). **2329 (Polokwane)**: Soutpansberg, Blouberg Nature Reserve, (–AA), 19 Jul 1986, *Klopper 52* (PRE). **2427 (Thabazimbi)**: Waterberg, Geelhoutbos, (–BC), 10 May 1977, *Germishuizen 293* (PRE); Geelhoutbosch Farm at foot of Kranzberg, (–BC), 10 May 1977, *Venter 1961* (PRE). **2430 (Pilgrim's Rest)**: Abel Erasmus Pass, on lowveld side of Strydom Tunnel, (–BC), 11 May 1981, *Zambatis 1177* (PRE).

MPUMALANGA.—**2431 (Acornhoek)**: Kruger National Park, Pilgrims Rest, 21 miles [33.6 km] north-east of Skukuza, (–DC), 10 May 1950, *Codd 6076* (PRE); Kruger National Park, Leeupan, (–DD), 26 Apr 1954, *Van der Schijff & Marais 3664* (PRE). **2531 (Komatipoort)**: East of Nelspruit, Uitkyk, Farm Witkoppoort 8, (–CA), 19 Jun 2005, *McMurtry 12663* (PRE).



Fig. 12. Inflorescence details of *Distephanus angolensis*, Meyer 1288 (PRE). Scale bar: 5 mm.

3.3.5. *Distephanus angolensis*. (O. Hoffm.) H. Rob. & B. Kahn in Proc. Biol. Soc. Washington 99(3): 498 (1986). *N. angolensis* O. Hoffm. in Nat. Pflanzenfam. [Engler & Prantl] 4(5): 285 (1892), illegitimate name [genus illegitimate]. *Antunesia angolensis* (O. Hoffm.) O. Hoffm. in Bol. Soc. Brot. 10: 178 (1893). *Gongrothamnus angolensis* (O. Hoffm.) Hiern in Cat. Afr. Pl. 3: 592 (1898). *Vernonia angolensis* (O. Hoffm.) N.E.Br. in Kew Bull. 1909: 116 (1909). *Vernonia lutea* N.E.Br. in Kew Bull. 1909: 116 (1909), superfluous replacement name for *G. angolensis* (O. Hoffm.) Hiern. Type: Angola, Mossamedes, on rocky declivities between Pomangala and Quitibe, Jun 1860, Welwitsch 3270 (LISU219541—ALUKA image!, lecto., designated here). [Syntypes: Angola, Huilla, thickets between Mumpulla and Nene, Oct 1859, Welwitsch 3266 (LISU219544); Angola, thickets near Bumbo, Oct 1859, Welwitsch 3264 (LISU219543)—ALUKA image!]. [Note: Welwitsch 3270 is selected as lectotype as being the most complete specimen and including dissections of several capitula].

Rounded or suberect shrub, 1–3 m; stem angled or weakly ribbed, felted when young with \pm appressed, shaggy hairs and sessile glands, glabrescent. Leaves alternate, broadly ovate to lanceolate, 20–80 \times 5–60 mm, 3-nerved from base, acute to acuminate, base cuneate and shortly decurrent on petiole or abruptly cuneate, margins entire or weakly and distantly serrate, felted when young with shorter, erect hairs mainly on veins and margins, and sessile glands, glabrescent, yellowish green, petiole 5–15 mm long. Capitula in globose clusters on divaricate branches in upper axils, forming cymose panicles, 3- to 5-flowered. Involucre obconic, 2–3 mm diam., bracts \pm 4-seriate, imbricate, thinly pubescent or subglabrous, margins membranous, ciliate, outer bracts ovate, acuminate-apiculate, \pm 2 mm long, inner lanceolate, \pm 4 mm

long, acute to acuminate, 3-veined. Florets yellow, \pm 6 mm long, corolla tube narrowly funnel shaped, lobes linear, recurved, \pm 2 mm long. Anthers sagittate, \pm 2 mm long. Style up to 7 mm long, pilose or shortly hirsute distally and on branches, branches \pm 2 mm long. Cypselas obovoid, \pm 10-ribbed, 1.5–2.5 mm long, shortly appressed-pilose with sessile glands in distal half; pappus biseriate, buff, scales 0.5–0.8 mm long, bristles 4–6 mm long, acute. Flowering time: Mar–Jul. (Figs. 11, 12).

Distribution and habitat. A range restricted species described from Namibe Province in southwestern Angola, *D. angolensis* extends shortly southwards into northern Kaokoland in northwestern Namibia (Fig. 8). It is restricted to rocky outcrops up to 1 850 m asl, growing between boulders or in crevices.

Diagnosis. Resembling *D. divaricatus* in its yellow florets and acute or acuminate involucre bracts, *D. angolensis* is distinguished from that species by the smaller, narrower capitula containing 3 to 5 yellow florets (vs campanulate capitula with 15 to 20 orange florets ageing yellow) and the concolourous (vs discolourous), yellowish green leaves. The two species are allopatric, with *D. divaricatus* extending from north central Namibia around Tsumeb eastwards and north into tropical Africa.

Additional specimens seen. NAMIBIA.—1712 (Posto Velho): Kaokoveld, Otjomborombonga; main kloof to the south, (–BB), 14 Jul 1976, Leistner, Oliver, Steenkamp & Vorster 157 (PRE); Kaokoveld, Otjihipaberger, (–BC), 8 Jul 1959, Davies, Thompson & Miller 84 (PRE); 2 Mar 1975, Vahrmeijer & Du Preez 2585 (PRE); northwest from Otjitanda, in rocks, (–BD), 11 Jul 1969, Meyer 1288 (PRE); Kaokoland, Roidrom, 4.2 km north at lower end of Marienfluss south of Kunene on low west south west slope of mountain, (–DC), 22 May 1991, Smook 7749 (PRE). 1713 (Opuwu): Kaokoveld, Ombepera, mountain slopes, (–DC), 11 Apr 1957, De Winter & Leistner 5506 (PRE).

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