Bothalia 42,2: 247–250 (2012)

FSA contributions 20: Asteraceae: Anthemideae: *Inezia*

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INTRODUCTION

The genus *Inezia* E.Phillips comprises two species endemic to eastern southern Africa, namely *I. intergrifolia* (Klatt) E.Phillips from Mpumalanga and Swaziland and *I. speciosa* Brusse from Limpopo. The type species *I. integrifolia* was originally described by Klatt (1896) in the genus *Lidbeckia* but Philips (1932) later accommodated it within a new monotypic genus *Inezia* (Table 1). A second species, *I. speciosa* was later described by Brusse (1989). The genus is placed within the subtribe Cotulinae of tribe Anthemideae (Himmelrich *et al.* 2008; Oberprieler *et al*. 2009). *Inezia* is distinguished from *Adenanthellum* and *Hilliardia* by having ovate or pinnatisect leaves and oblong, 4-angled cypselae with bicellular glands scattered on the outer surface. In the previous subtribal classification of Bremmer (1994), *Inezia* was placed within the now sub-assumed subtribe Thaminophyllinae, together with *Adenanthellum* B.Nord., *Lidbeckia* P.J.Bergius and *Thaminophyllum* Harv. Nordenstam (1976, 1987), when describing the genus *Hilliardia* B.Nord., suggested that it had affinities to *Inezia* and *Adenanthellum* on the basis of the similar ray florets with bifid or emarginate limbs and the often reduced perianth tube with a mix of eglandular hairs and bicellular glands on the margins, the distinctive branched venation and minutely papillate upper surface of the perianth limbs, and the linear, flattened, epappose cypselae with ciliate margins and scattered bicellular glands on the outer surface (Figure 1A–D). This relationship is supported by phylogenetic analyses of cpDNA ndhF sequence data (Himmelrich *et al*. 2008). Analyses of nrITS sequence data, however, suggests a close relationship between *Inezia* and *Hilliardia,* but places *Thaminophyllum* rather with *Lidbeckia*. A close relationship between *Lidbeckia* and *Thaminophyllum* was also suggested by Bremer & Humphries (1993) based on the pilose receptacles and myxogenic cells on the cypselae.

TABLE 1.—Differences between Lidbeckia and Inezia.

Inezia	*Lidbeckia*
From montane grassland in northeastern southern Africa.	From fynbos in the southwestern Western Cape.
Involucral bracts with scarious margins.	Involucral bracts without scarious margins.
Stylopodium of thick-walled cells in fruit.	Stylopodium of thin-walled cells, large and persistent.
Nectaries in disc florets smaller.	Nectaries conspicuously larger.
5–8 rows of cells in filament collars.	9–10 rows of cells in filament collars.
Cypselae non-myxogenic.	Cypselae myxogenic.

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MS. received: 2011-06-30.

In this paper a detailed taxonomic treatment of the two species of *Inezia* is presented, including a key to the species, typification, distribution maps and illustrations.

MATERIAL AND METHODS

All the *Inezia*, *Hilliardia*, *Adenanthellum*, *Thaminophyllum*, and *Lidbeckia* specimens at PRE were studied. Digital images of type collections were, where necessary, accessed on the Aluka digital library (http://plants.jstor.org, accessed July 2011). *Hilliardia zuurbergensis, I. integrifolia, I. speciosa, Lidbeckia pectinata,* and *Lidbeckia quinqueloba* specimens were examined by means of the scanning electron microscope (SEM). All samples were dry and were not chemically treated before being sputter-coated with gold-palladium.

MICROMORPHOLOGY

Inezia is characterised by the presence of large sessile glands on the ovary, cypselae, perianth tube and perianth lobes of both ray and disc florets. SEM study reveals that the large sessile glands are bicellular. The epidermal cells on the upper surface of the rays of *I. integrifolia* are round and radially striate with thick walls (Figure 1A–D).

TAXONOMY

Inezia *E.Phillips* in Kew Bulletin 6: 297 (1932); Bremer & Humphries: 146 (1993); Bremer: 471 (1994); Herman *et al*.:145 (2000). Type species: *I.integrifolia* (Klatt) E.Phillips.

Subshrubs with woody rootstock, stems branching distally, terete, sparsely pilose to villous. *Leaves* alternate, entire or pinnatisect, glandular-pilose. *Capitula* solitary, terminal, radiate, pedunculate. *Involucre* campanulate; *involucral bracts* in 3 or 4 rows, imbricate, ± linear, pilose, inner bracts with membranous tip; *receptacle* conical, epaleate. *Ray florets* female-fertile or sterile, yellow or white, with bicellular glands scattered over the surface; corolla tube short or absent with mix of eglandular hairs and bicellular glands on the margins, limb obovate, 2-toothed, three to four × longer than tube. *Style* branched, truncate, with stigmatic areas lateral; *ovary* with bicellular glands. *Cypselae* linear, flattened, margins ciliate and with scattered bicellular glands on the outer surface, non-myxogenic; *pappus* absent. *Disc florets* bisexual, fertile, yellow with bicellular glands scattered over the surface, narrowly funnel-shaped, corolla tube somewhat compressed, winged, 4-lobed, two lateral lobes ± cucullate, dorsal and ventral lobes ovate. *Stamens* 4, filament collars with 6–8 rows of cells; *anthers* minutely caudate, with ovate to oblong apical appendages; *style* terete, somewhat swollen at

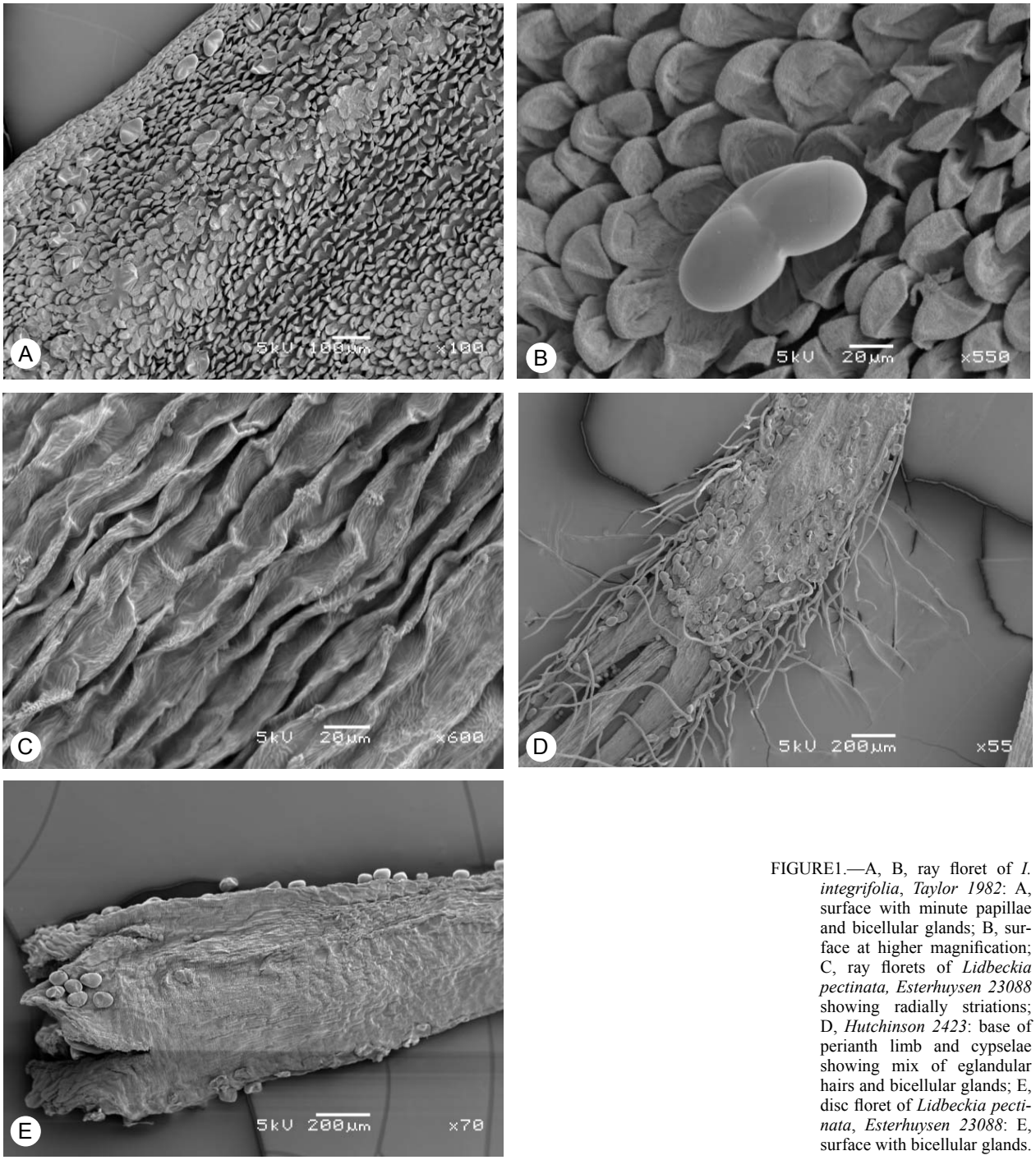

FIGURE1.—A, B, ray floret of *I. integrifolia*, *Taylor 1982*: A, surface with minute papillae and bicellular glands; B, surface at higher magnification; C, ray florets of *Lidbeckia pectinata, Esterhuysen 23088* showing radially striations; D, *Hutchinson 2423*: base of perianth limb and cypselae showing mix of eglandular hairs and bicellular glands; E, disc floret of *Lidbeckia pectinata*, *Esterhuysen 23088*: E, surface with bicellular glands.

base, branches oblong, truncate, laterally stigmatic; cells of stylopodium thick walled; *ovary* four ribbed, flattened, bicellular gland scattered throughout. Cypselae oblong, 4-angled, flattened when matured, with bicellular glands scattered on the outer surface, non-myxogenic; *pappus* absent.

2 spp., northeastern South Africa and Swaziland

Etymology: the genus name *Inezia* is named in honour of Ms Inez Clare Verdoorn (1896–1989), appointed to the Division of Botany and Plant Pathology as herbarium assistant in 1917 and later in charge of the National Herbarium as Senior Professional Officer (1944–1951). She is commemorated also in *Aloe verdoorniae* Reynolds, *Senecio verdoorniae* R.A.Dyer, *Teclea verdoorniana* Exell & Mendonça (Glen & Germishuizen 2010).

Key to species

1. All leaves simple; peduncles up to 50 mm long; ray florets yellow; Mpumalanga and Swaziland . . . . . 1. *I. integrifolia*
1.' Lower leaves pinnatisect, upper leaves simple; peduncles more than 200 mm long; ray florets white; Limpopo . . . . . 2. *I. speciosa*

1. **I. integrifolia** (*Klatt) E.Phillips* in Kew Bulletin 6: 297 (1932). *Lidbeckia integrifolia* Klatt: 840 (1896). Type: [Mpumalanga], Saddleback Mountain, 4 000' [1 312 m], Dec.1890, *Galpin 1174*, (PRE, lecto.!, designated here; K—Aluka image!, SAM!, isolecto.). [The

collection by Galpin is chosen here from the three collections cited by Klatt in the protologue as it has more precise collection details.]

Subshrub from woody rootstock, 0.2–0.6 m high, stems branching distally, sparsely pilose to villous. *Leaves* alternate, sessile, ovate, 6.5–22.0 × 3.0–5.5 mm, entire, acuminate, dull green, moderately to densely pilose. *Capitula* solitary, pedunculate, peduncle 20–50 mm long, ribbed, glandular-pilose; *involucre* campanulate, 5–12 mm diam.; *involucral bracts* in 2 or 3 series, imbricate, sparsely to densely hairy, greyish with red-purple tips or rimmed at top with purple; outer bracts linear, 3.5–4.0 × 1.0 mm, moderately to densely pilose, inner bracts oblong with membranous tips, 4–7 × 0.5–1.2 mm; *receptacle* epaleate. *Ray florets* female-fertile, scarcely longer than involucre, yellow with bicellular glands scattered over the surface; corolla tube 1.5 mm long, base of perianth with mix of eglandular hairs and bicellular glands on the margins, limb up to 4.5 mm long, 2-lobed, adaxial epidermal cells round with thick walls and radial striations; *style* 1.0–1.1 mm long, branches 0.1 mm long. C*ypsela* 1.0–1.2 mm long, ciliate along margins, with scattered bicellular glands on the outer suface. *Disc florets* bisexual, fertile, yellow, 1.5–2.0 mm long, bicellular glands scattered over the surface, lobes 0.1 mm long; *style* 1.8–2.0 mm long, branches 0.18–0.20 mm long; *ovary* 1.0 mm long. *Cypsela* 1.2–1.5 mm long, 4-angled and laterally flattened, ciliate along margins, with bicellular glands scattered on the outer surface, non-myxogenic; *pappus* absent. *Flowering time*: Nov.–Apr. (Figures 1A–E).

Distribution and habitat: *Inezia intergrifolia* occurs in Mpumalanga, from around Piet Retief and Komatipoort, north to Pilgrim's Rest, and around Mbabane in Swaziland, from 650–2 152 m (Figure 2). The species favours montane grasslands, especially humus-rich soils.

Notes: Inezia intergrifolia is distinguished from *I. speciosa* by the consistently simple leaves along the entire length of the branch, the shorter peduncles up to 50 mm long, and the smaller involucre 5–12 mm long with red or purple tipped bracts arranged in 2- or 3 rows, and the yellow ray florets.

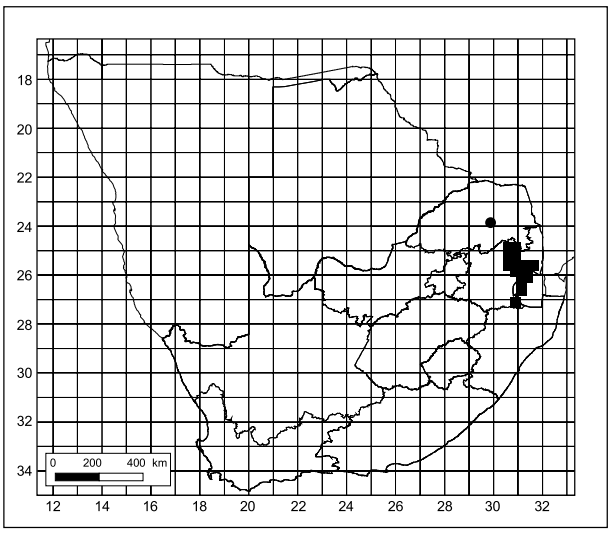

FIGURE 2.—Distribution of *Inezia integrifolia,* ■; and *I. speciosa*, ●.

Conservation status: LC (Least Concern) (Raimondo *et al*. 2009).

Additional specimens

MPUMALANGA.—**2430** (Pilgrim's Rest): Mount Sheba, (–DC), 14 Feb. 1982, *Brenan 14962* (PRE); Ohrigstad Dam Nature Reserve, (–DC), 16 Feb. 1972, *Jacobsen 2321* (PRE); Pilgrim's Rest on hillsides, (–DD), 12 Mar. 1937, *Galpin 14420* (PRE); Graskop, (–DD), 18 Jan. 1921, *Irvine & Irvine 11421* (PRE); Jan. 1920, *Rogers 23592* (PRE). **2530** (Lydenburg): Mount Anderson, summit peak, (–BA), 9 Mar. 1933, *Galpin 13757* (PRE); Mount Anderson, (–BA), 16 Jan. 1952, *Prosser 1800* (PRE); Vertroosting Nature Reserve, 12 km S of Sabie, (–BB), 25 Feb. 1972, *Muller 2469* (PRE); Nelspruit, Wonderkloof Nature Reserve, (–BC), 18 Nov. 1974, *Elan-Puttick 183* (PRE); Witklip, (–BD), 17 Jan. 1974, *Kluge 444* (PRE); Nelspruit, slopes of Amajuba Mountain (Schagen), (–BD), Dec. 1934, *Liebenberg 3320* (PRE); Kaapsehoop, Devil's Kantoor, (–DB), 11 Jan. 1924, *Pole Evans 998*, (PRE); Barberton, Nelshoogte Forest Station, (–DD), 8 Dec. 1953, *Codd 8132* (PRE); Barberton, Thorncroft Nature Reserve, (–DD), 6 Jan. 1972, *Muller 2274* (PRE); Nelsberg, (–DD), 26 Feb. 1936, *Taylor 1982* (PRE). **2531** (Komatipoort): Sheba Mine, Colombo 365 JU Farm 15 KM. S of Sheba Mine, (–CA), 1980, *Fourie 230* (PRE); mountain top between Louw's Creek and Maid of the Mist, (–CA), 5 Jan. 1929, *Hutchinson 2423* (PRE); Malelane, (–CB), Nov. 1924, *Murphy 106*, (PRE); 10 miles [16.1 km] SE Barberton on road to Havelock, (–CC), 9 Dec. 1953, *Codd 8165* (PRE); Barberton, Oosterbeek Farm, 5 km S Barberton, (–CC), 15 Nov. 1977, *De Souza 628* (PRE); on Barberton-Havelock road, 14 miles [22.4] from Barberton, 9 Feb. 1962, *Ihlenfeldt 2432* (PRE); near top of mountain behind Barberton village, (–CC), 18 Feb. 1931, *Liebenberg 2420* (PRE); Ida Doyer Nature Reserve, 38 km SE Barberton, (–CC), 7 Dec. 1971, *Muller 2050* (PRE); Barberton, (–CC), Jan. 1907, *Thorncroft TRV4973* (PRE); Barberton, Tinie Louw Nature Reserve, (–CC), 15 Jan. 1983, *Venter 9176* (PRE); W of Ngodwana, Hemlock Tulloch Mhor Nature Reserve, (–DA), 15 Feb. 2003, *McMurtry 11157* (PRE). **2730** (Piet Retief): Piet Retief, 15 km from Piet Retief on road to Amsterdam, (–BB), Mar. 1973, *Arnold 245* (PRE).

SWAZILAND.—**2631** (Mbabane): Ngwenya Hills, (–AA), 30 Jan. 1957, *Compton 26527* (PRE); Malolotja Nature Reserve, above Forbes Reef Dam, old kraal, (–AA), 2 Dec. 1986, *Heath 533* (PRE); Endingeni, Middle veld, (–AB), 18 Dec. 1970, *Barrett 551* (PRE); Hhohho, Malandzela area; road to Maphalaleni, 14 km from Nyokane (tar road) above Komati River and below Enkaba Trig beacon, (–AB), 25 Jan. 1994, *Hobson 2075* (PRE); Mbabane, (–AC), Dec. 1905, *Bolus 12012* (PRE); Black Umbuluzi Valley, 9 km from Mbabane to Balegane near mission falls, (–AC), 27 Dec. 1985, *Brusse 4344* (PRE); Mbabane, (–AC), Jan. 1905, *Burtt Davy 2868* (PRE); 17 Jan. 1951, *Compton 22463* (PRE); Mbabane, Ukutula, (–AC), 6 Jan. 1956, *Compton 25291* (PRE); Bomvu Ridge, (–AC), 5 Jan. 1962, *Compton 31193* (PRE); Mbabane Area, (–AC), 7 Dec. 1960, *Dlamini PH31853* (PRE); Usutu Forest, (–CA), Dec. 1974, *Watson 8* (PRE).

2. **I. speciosa** *Brusse* in Bothalia 19: 27–29 (1989). Type: [Limpopo], Iron Crown Mountain near Haenertsburg, 5 500' [1 804 m], *L.E.Codd 9440*, 24 Jan. 1956 (PRE, holo!; K [2 sheets]—Aluka image!, MO—Aluke image!, iso.).

Subshrub up to 0.45 m., main stem simple to 2-branched at base but well branched above, erect, hirsute, sparsely leafy, branches simple, ascending densely leafy, hirsute. *Leaves* dimorphic, lower impari-pinnatisect, upper linear-lanceolate, up to 20 mm long, moderately to densely hirsute, margins involute. *Capitula* solitary, radiate, pedunculate, peduncle 225–290 mm long, ribbed, hirsute; *involucre* campanulate, 20–25 mm long when pressed; *involucral bracts* in 3 or 4 series, imbricate, narrowly lanceolate, brownish-red, hirsute on outer surface, glabrous on inner surface, outer 5.0–6.0 ×1.0–1.5 mm, inner 6.0–9.0×1.0–1.5 mm. *Ray florets* 25–30,

female or, white with bicellular glands scattered over the surface, corolla tube 1.0 mm long, limb 3-lobed base of perianth limb with mix of eglandular hairs and bicellular glands on the margins, adaxial epidermal cells obtusely acuminate, radially slightly striate; *ovary* not well developed, with scattered bicellular glands. *Disc florets* bisexual, fertile, yellow, 2.5–3.0 mm long, with scattered bicellular glands on the outer surface, lobes 0.4–0.5 mm long; *style* 2.5 mm long, branches 0.6 mm long; *ovary* 1.0–1.5 mm long. *Cypselae* 1.5–2.5 mm long, 4-angled, laterally flattened, ciliate along margins with scattered bicellular glands on the outer surface, non-myxogenic; *pappus* absent. Flowering time: Nov.–Jan.

Distribution and ecology: Inezia speciosa is known only from the type locality near the summit of Iron Crown Mountain near Haenertsburg, 1 804 m (Figure 1), where it has been collected on two occasions. It favours quartzite rock, especially grassy slopes which are rich in forb species with scattered trees and shrubs (Mucina & Rutherford 2006).

Notes: Inezia speciosa can be distinguished from *I. integrifolia* by its dimorphic foliage, with the lower leaves pinnatisect and the upper simple, the longer peduncles more than 200 mm long, the larger involucre 20–25 mm long with bracts in 3or 4 series, and the white ray florets.

Conservation status: **EN** B1ab (iii) + 2ab (iii) (endangered) (Raimondo *et al*. 2009).

Additional specimen examined

LIMPOPO.—**2329** (Polokwane): Wolkberg, Iron Crown, just W of summit, (–DD), 29 Nov. 1980, *McMurtry 4208* (PRE).

ACKNOWLEDGEMENTS

My colleagues from the South African National Biodiversity Institute: P. Herman for guidance and discussions and Hester Steyn for producing the distribution map. Referees are thanked for their valuable comments. The curator and staff of Harvard University Herbarium and SAM are also thanked for sending digital images of type material.

REFERENCES

BREMER, K. 1994. *Asteraceae: cladistics & classification.* Timber Press, Portland, Oregon.

BREMER, K. & HUMPHRIES, C. 1993. Generic monograph of the Asteraceae–Anthemideae. *Bulletin of the Natural History Museum, Botany Series* 23: 71–177.

BRUSSE, F. 1989. A new species of *Inezia* (Anthemideae) from the north-eastern Transvaal. *Bothalia* 19: 27–29.

GLEN, H.F. & GERMISHUIZEN, G. (compilers). 2010. Botanical exploration of southern Africa, edition 2. *Strelitzia 26.* South African National Biodiversity Institute, Pretoria.

HERMAN, P.P.J., RETIEF, E., KOEKEMOER, M. & WELMAN, W.G. 2000. Asteraceae. In O.A. Leistner, Seed plants of southern Africa: families and genera. *Strelitzia* 10: 101–170. National Botanical Institute, Pretoria.

HIMMELREICH, S., KÄLLERSJÖ, M., ELDENÄS, P. & OBERPRIELER, C. 2008. Phylogeny of southern hemisphere Compositae–Anthemideae based on nrDNA ITS and cpDNA ndhF sequence information. *Plant Systematics and Evolution* 272: 131–153.

KLATT, F.W. 1896. Tribe Anthemideae: *Lidbeckia integrifolia* Klatt. *Bulletin de l'Herbier Boisser* vol 4: 840.

MUCINA, L. & RUTHERFORD, M.C. (eds). 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.

NORDENSTAM, B. 1976. Re-classification of *Chrysanthemum* L. in South Africa. *Botaniska Notiser* 129: 137–165.

NORDENSTAM, B. 1987. Notes on South African Anthemideae (Compositae). *Opera Botanica* 92: 147–151.

OBERPRIELER, C., HIMMELREICH, S., KÄLLERSJÖ, M., VALLÈS, J., WATSON, L.E. & VOGT, R. 2009. Anthemideae. In V.A. Funk., A. Susanna, T.F. Stuessy. & R.J. Bayer, *Systematics, evolution and biogeography of Compositae.* International Association for Plant Taxonomy, Vienna, Austria.

PHILLIPS, E.P. 1932. *Inezia*, a new genus of Compositae from South Africa. *Kew Bulletin*: 297, 298.

RAIMONDO, D., VON STADEN, L., FODEN, W., VICTOR, J.E., HELME, N.A., TURNER, R.C., KAMUNDI, D.A. & MANYAMA, P.A. 2009. Red List of South African plants 2009. *Strelitzia 25*. South African National Biodiversity Institute, Pretoria.