

## NEW SPECIES AND NEW COMBINATIONS IN THE SOUTH AMERICAN GENUS *LESSINGIANTHUS* (*ASTERACEAE: VERNONIEAE*)

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Two new species of the South American genus *Lessingianthus* (*Asteraceae: Vernonieae*) are described and illustrated. One of these species, *Lessingianthus arctatus*, bears a resemblance to *L. linearis* (Spreng.) H. Rob. and *L. rosmarinifolius* (Less.) H. Rob., but can be separated from them by its almost glabrous phyllaries, solitary heads and longer internodes. The other new taxon, *Lessingianthus longicuspis*, can be easily separated from *L. cataractarum* (Hieron.) H. Rob. and *L. bardanoides* (Less.) H. Rob., and other taxa of the genus, by the combination of petiolate leaves, aristate phyllaries and inflorescence bracts alternate to the heads. Four other taxa previously included in *Vernonia* are transferred to the genus *Lessingianthus*.

*Keywords.* Brazil, cerrado, taxonomy, *Vernonia*, *Vernonieae*.

### INTRODUCTION

The genus *Lessingianthus* H. Rob. is widely distributed in tropical South America, with a concentration in eastern Brazil. The species are perennial herbs or shrubs with xylopodia, having medium- or large-sized heads and seriate-cymose inflorescences (Robinson, 1988). The genus was initially established to recognise the species originally arranged under *Vernonia* Schreb. sect. *Lepidaploa* (Cass.) DC. subsect. *Macrocephalae* Benth. (Baker, 1873). As presently delimited, the genus comprises more than 110 species that mostly occur in campo cerrado and campo rupestre habitats (Bremer, 1994; Robinson, 2007).

Among other features, *Lessingianthus* can be distinguished from the remaining genera of the tribe *Vernonieae* by its pollen type, anther appendages, chromosome number and the shape of the raphids in the achene wall (Dematteis, 2006). The pollen grains are type 'B' (Keeley & Jones, 1979), tricolporate, echinolophate, with a discontinuous tectum, germinal furrows very long, converging at poles and lacunae disposed in a regular pattern, lacking a polar lacuna. The anther appendages of *Lessingianthus* commonly lack glands, while some of its related genera have glandular appendages (Robinson, 1988; Dematteis, 2007). The basic chromosome number of the genus is  $x=16$ , differing from the majority of the American *Vernonieae* with a base number of  $x=17$  (Dematteis, 2002). The raphids in the achene walls of

*Lessingianthus* are quadrate to subquadrate, while in the allied *Lepidaploa* Cass. and *Chrysolaena* H. Rob. the raphids are usually elongate (Robinson, 1999).

Since the description of the genus *Lessingianthus* (Robinson, 1988) there have been few problems in generic limits. The single modification has been the transference of *Lessingianthus* subgen. *Oligocephalus* H. Rob. to the genus *Chrysolaena* (Dematteis, 2007). However, several species still included in *Vernonia* have not been examined and consequently their taxonomic position is still uncertain. In the present paper four Brazilian species previously placed in *Vernonia* are transferred to *Lessingianthus* and two taxa proposed as new species are described and illustrated.

#### NEW SPECIES AND NEW COMBINATIONS

##### ***Lessingianthus arctatus* Dematt., sp. nov. Fig. 1.**

Haec species *Lessingiantho lineari* (Spreng.) H. Rob. similis sed foliis latioribus, phyllariis glabratis et capitulis solitariis differt. Herba erecta 60–70 cm alta, caulibus simplicibus rotundatis sparse foliatis. Folia discolora linearia, 3.5–5 cm longa, 0.2–0.3(–0.4) cm lata, supra glabrata inferne incana. Capitula solitaria, sessilia, late campanulata ad inflorescentiam cymosam 5–8-cephala disposita. Corolla 11–13 mm longa, lobis lanceolatis, 4.5–5 mm longis. – Type: Brazil, Goiás, Alto Paraíso de Goiás, Rod. GO-118 km 174, N de Alto Paraíso de Goiás, Fazenda Agua Fria, 14°04'25"S, 47°30'39"W, c.1460 m, campo rupestre, 31 vii 2000, *M. Magenta, R. Forzza, C. Kameyama & J.V. Nunes* 266 (holo SPF; iso CTES).

Perennial herbs, 60–70 cm tall. *Stems* single, rounded, 2–2.5 mm in diameter, incanous, laxly leafy to the inflorescence, internodes 1.5–3 cm long. *Leaves* alternate, sessile, coriaceous, discoloured. *Leaf* blades linear, 3.5–5 cm long, 0.2–0.3(–0.4) cm wide, entire, revolute at the margin, apically acute, cuneate at base, glabrous above, incanous beneath, pinnatinervate, secondary veins prominent above. *Inflorescence* terminal, branches erect, seriate-cymose, 18–25 cm long, bearing 5–8 heads. *Capitula* sessile, solitary. *Bracts* of the inflorescence leafy, alternate to the heads, gradually reduced upwards, longer than the heads. *Involucres* campanulate, 8–9 mm high, 8–11 mm wide. *Phyllaries* disposed in 6–7 series, densely imbricate, appressed, brownish, acuminate, inner phyllaries ovate-lanceolate, glabrous to villous at apex, the outer ones ovate, glabrous to laxly pilose. *Florets* violet, 20–22 per head. *Corollas* glabrous, 11–13 mm long, lobes lanceolate, 4.5–5 mm long. *Anthers* basally calcarate, thecae 4.5–5 mm long, apical appendages ovate, 0.2–0.3 mm long. *Style* 10–11 mm long, branches linear, 2.5–3 mm long. *Cypselas* obconical, ribbed, densely sericeous, 2–2.5 mm long. *Pappus* biseriate, yellowish, inner bristles 6–7 mm long, outer scales lanceolate, fimbriate, 0.6–0.8 mm long.

*Distribution and ecology.* Occurs on campo rupestre vegetation. The new species is known thus far only from the type collection from the eastern area of the Brazilian state of Goiás, near the border with Bahia (Fig. 2).

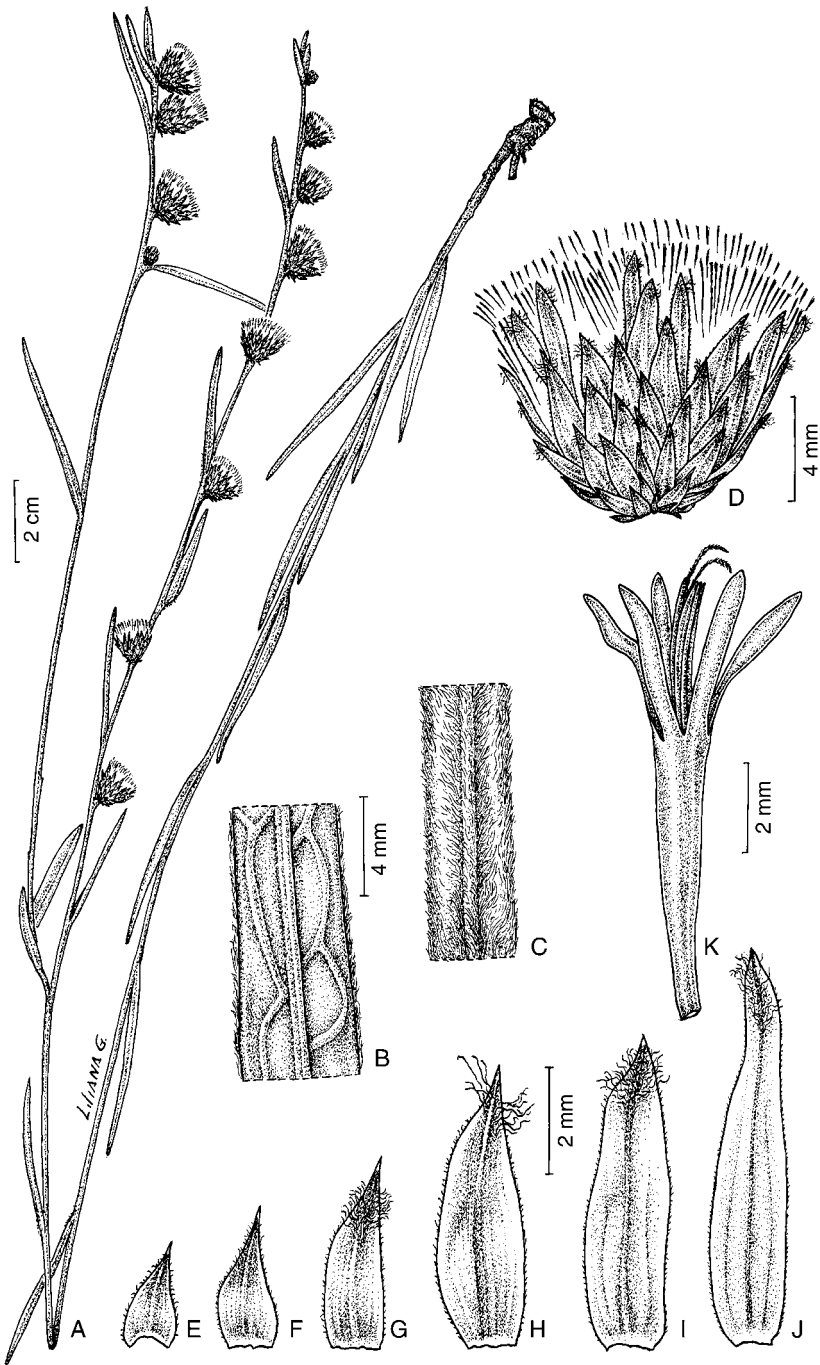


FIG. 1. *Lessingianthus arctatus* Dematt. A, habit; B, leaf blade, adaxial surface; C, leaf blade, abaxial surface; D, capitulum; E–F, outer phyllaries; G–H, middle phyllaries; I–J, inner phyllaries; K, corolla showing anthers and style. From Magenta, Forzza, Kameyama & Nunes 266, isotype.



FIG. 2. Geographic distribution of *Lessingianthus arctatus* (●) and *L. longicuspis* (◆).

*Flowering and fruiting.* The single available collection was made in July, which is not common in the genus *Lessingianthus*, because almost all the species flower and fruit during the summer, between December and March.

*Etymology.* The name of the new species refers to the appressed phyllaries of the involucre (*arctus* = pressed, compressed).

The new species seems to be closely related to *Lessingianthus linearis* (Spreng.) H. Rob. and *L. rosmarinifolius* (Less.) H. Rob. However, *Lessingianthus arctatus* can be distinguished by its almost glabrous phyllaries, solitary heads and long internodes. The two species cited above have dense white-tomentose involucre, while the phyllaries of *Lessingianthus arctatus* are brownish and almost glabrous. The most important differences between these species are summarised in Table 1.

TABLE 1. Diagnostic morphological characters of *Lessingianthus arctatus* and related taxa

Character	<i>L. arctatus</i>	<i>L. linearis</i>	<i>L. rosmarinifolius</i>
Basal internodes (mm)	15–30	1–3	2–5
Blade width (mm)	2–3(–4)	1.5–2	1–1.8
Heads	Solitary	Geminate, rarely solitary	2–4 glomerate
Involucre	Glabrous	Densely tomentose	Tomentose
Phyllaries	Appressed	Curved	Appressed
Outer scales of pappus (mm)	0.6–0.8	1.5–2	1–1.6

***Lessingianthus clavatus* (Gardner) Dematt., comb. nov.**

*Vernonia clavata* Gardner, London J. Bot. 5: 220 (1846). – Type: Brazil, Minas Gerais, Elevated campos Diamond district, viii 1840, *G. Gardner* 4791 (holo BM).

*Distribution and ecology.* This species is known only from the type and two additional specimens collected near Diamantina, in the central area of the Brazilian state of Minas Gerais.

*Flowering and fruiting.* June to August.

In the single taxonomic treatment to include this species since its description, Baker (1873) placed *Vernonia clavata* in *Vernonia* sect. *Lepidaploa* subsect. *Axilliflorae* Benth. & Hook. This group contains some species now placed in *Lessingianthus*, but mainly comprises taxa belonging to the genus *Lepidaploa* Cass. A detailed analysis of the type material found that *Vernonia clavata* shows all the basic characteristics of *Lessingianthus* and consequently it should be included in that genus. Among the species of this group, *Lessingianthus clavatus* seems to be closely related to *L. mansoanus* (Baker) H. Rob. and *L. lanuginosus* Dematt., from which it can be distinguished by the length of the petioles and the number of florets.

*Additional specimens examined.* BRAZIL. **Minas Gerais:** 15 km N de Diamantina, 4 vii 1989, *M.B. Vasconcellos & L.P. Queiroz* 21723 (UEC); Estrada Diamantina-Mendanha, km 585, 6 vi 1985, *J. Semir, J.Y. Tamashiro, F.R. Martins & H.F. Leitão Filho* 17538 (UEC).

***Lessingianthus declivium* (Malme) Dematt., comb. nov.**

*Vernonia declivium* Malme, Kongl. Svenska Vetensk. Acad. Handl. 32(5): 26 (1899).  
– Type: Brazil, Mato Grosso, Serra da Chapada, 2 vi 1894, *G.O. Malme* 1656 (holo S; iso S).

*Distribution and ecology.* Endemic to forests in Mato Grosso state in western Brazil.

*Flowering and fruiting.* March to July.

This species was not considered by Robinson (1988) in the segregation of *Lessingianthus*, but it clearly belongs to this genus. It appears to be closely related to *Lessingianthus saltensis* (Hieron.) H. Rob., but can be easily separated by the

phyllary apex: *Lessingianthus declivium* has largely aristate phyllaries, while *L. saltensis* always has acute tips.

*Additional specimens examined.* BRAZIL. **Mato Grosso:** Santa Anna da Chapada, 18 v 1903, *G.O. Malme* 3307a (S); arredores do Lago Azul, 42 km ENE de Nobres, 24 v 1997, *V.C. Souza* 17170 (K, UEC); Santa Anna da Chapada, 26 v 1903, *G.O. Malme* 3307b (S); Santa Anna da Chapada, 29 vii 1902, *G.O. Malme* 3307c (S); Santa Anna da Chapada, 12 v 1903, *G.O. Malme* 3307 (R, S); Santa Anna da Chapada, 27 vii 1902, *G.O. Malme* 2104 (R, S); Estrada do Rosario, iii 1918, *J.G. Kuhlmann* 2379 (R); caminho para Lavra per Caceres, vii 1908, *F.C. Hoehne* 301 (R); Fazenda Santa Edwiges, varzea do rio São Lourenço, 3 km além do Retiro Sinhorinho, 7 v 1995, *A.A. Oliveira & N. Roque* 2521 (ALCB, SPF).

***Lessingianthus flotowioides* (Baker) Dematt., comb. nov.**

*Vernonia flotowioides* Baker in Mart., Fl. Bras. 6(2): 81 (1873). – Type: Brazil, Mato Grosso, Cuiabá, 1834, *P. Silva Manso* 78 (holo BR).

*Distribution and ecology.* This species is known only from the type collection from Cuiabá in the Brazilian state of Mato Grosso. No other duplicates have been found in herbaria, which suggests that the Patricio da Silva Manso collection consists of only one specimen.

*Flowering and fruiting.* Unknown.

*Lessingianthus flotowioides* appears to be closely related to *L. ramellae* (Cabrera) H. Rob. and *L. pumillus* (Vell.) H. Rob., but differs from these species in having a seriate-cymose inflorescence, lanceolate leaves and smaller heads.

***Lessingianthus graminifolius* (Gardner) Dematt., comb. nov.**

*Vernonia graminifolia* Gardner, London J. Bot. 6: 421 (1847). – Type: Brazil, Goiás, Dry grassy campos Villa de Arrayas, iv 1841, *G. Gardner* 3799 (holo BM; iso G, K, S, W).

*Distribution and ecology.* This species is distributed in western Minas Gerais, Goiás and Tocantins in Brazil, growing in highlands in campo and cerrado habitats.

*Flowering and fruiting.* February to May.

This species resembles some specimens of *Lessingianthus glabratus* (Less.) H. Rob. that occasionally have narrowly lanceolate leaves. However, the latter species has linear and largely acuminate outer phyllaries, while *Lessingianthus graminifolius* has ovate phyllaries, rounded or rarely mucronate at the apex. Robinson (1999) considered this taxon to be a synonym of the widespread *Lessingianthus psilophilus* (DC.) H. Rob. *Lessingianthus psilophilus* has turbinate involucre, composed of 7–9 series of acute phyllaries, with the outermost on the peduncles. On the other hand, *Lessingianthus graminifolius* has campanulate, 4–5 seriate involucre with obtuse to subobtuse phyllaries.

*Additional specimens examined.* BRAZIL. **Minas Gerais:** c.145 km N of Belo Horizonte, 21 ii 1968, *H.S. Irwin, H. Maxwell & D.C. Wasshausen* 20627 (LP). **Tocantins:** Mateiros, Fervedouro, 3 v 2001, *E. Farias, A.B. Sampaio, L.C. Milhomens & P.L. Simpson* 381 (UB); Mateiros, 8 v 2001, *C. Proença, L.H. Soares e Silva, A.B. Sampaio & M.F. Simon* 2495 (UB); Mun. Mateiros, região do Jalapão, 8 v 2001, *A.B. Sampaio, P.L. Simpson, C.E.B. Proença, L.H.S. Silva & M.F. Simon* 514 (UB).

***Lessingianthus longicuspis* Dematt., sp. nov. Fig. 3.**

*Lessingiantho cataractarum* Less. similis sed involucris longioribus et capitulis sessilibus differt. Frutex erectus, caulibus dense foliatis. Folia alterna petiolata, 10–15 cm longa, 3–4 cm lata. Inflorescentiae cymosae, ramis erectis, 15–30 cm longis, 3–8-cephalis. Capitula sessilia, solitaria, hemisphaerica vel late campanulata, 11–13 mm alta. Phyllaria ovata vel ovato-lanceolata, recurvata, longe aristata. Corolla glabrata, 14–16 mm longa. – Type: Bolivia, Santa Cruz, Angel Sandoval Province, Santo Corazón, nacientes del río del mismo, 7 km al NO del pueblo, cerrado con *Callisthene*, *Curatella* y *Qualea*, 470 m, hierba de flores moradas, 1 v 1997, *A. Fuentes, I. Garcia & C. Cabrera* 1863 (holo CTES; iso USZ).

Erect branched shrubs, 1–2 m tall. *Stems* ribbed, 3–5 mm in diameter, laxly to densely tomentose, leafy to the inflorescence, internodes 10–25 mm long. *Leaves* alternate, shortly petiolate, membranous, gradually decreasing in size towards the stem apex. *Petioles* tomentose, 1–5 mm long. *Leaf* blades lanceolate to oblanceolate, 10–15 cm long, 3–4 cm wide, denticulate to serrate, entire near the base, acute to apiculate at the apex, basally attenuate, pulverulent to glabrous above, glandular dotted and commonly pubescent beneath, pinnatinerved, secondary veins arcuate, 7–10, prominent beneath. *Inflorescence* terminal, branches erect, seriate-cymose, 15–30 cm long, bearing 3–8 heads. *Bracts* of the inflorescence leafy, alternate to the heads, regularly reduced upwards, always longer than the heads. *Capitula* sessile to subsessile, solitary. *Involucres* hemispherical to widely campanulate, 11–13 mm high, 10–15 mm wide. *Phyllaries* disposed in 6–7 series, coriaceous, densely imbricate, recurved, largely aristate at the apex, purple-brownish, sparsely lanate near the apex, inner phyllaries ovate, the outer ones ovate to ovate-lanceolate. *Florets* purple, 40–50 per head. *Corollas* glabrous, 14–16 mm long, lobes lanceolate, 5–6 mm long. *Anthers* basally calcarate, thecae 4.5–5.2 mm long, apical appendages ovate, 0.25–0.35 mm long. *Style* 13–15 mm long, branches linear, 3.5–4 mm long. *Cypselas* cylindrical, ribbed, pilose, 3.5–4 mm long. *Pappus* biseriate, white, inner bristles 8–9 mm long, outer scales linear, fimbriate, 0.7–1 mm long.

*Distribution and ecology.* This species is distributed along the mountain ranges Ricardo Franco and Bodoquena, near the border between Brazil and Bolivia next to the Pantanal region (Fig. 2). This constitutes an area of low hills characterised by limestone soil.

*Flowering and fruiting.* March to May.



FIG. 3. *Lessigianthus longicuspis* Dematt. A, flowering branch; B, capitulum; C-E, outer phyllaries; F-G, middle phyllaries; H-I, inner phyllaries; J, corolla showing anthers and style. From Fuentes, Garcia & Cabrera 1863, holotype.



TABLE 2. Diagnostic morphological characters of *Lessingianthus longicuspis* and related taxa

Character	<i>L. bardanoides</i>	<i>L. cataractarum</i>	<i>L. glabratus</i>	<i>L. longicuspis</i>
Petioles (mm)	–	–	–	1–5
Leaf size (cm)	5–6 × 2.5–4	10–12 × 1.5–3	8–20 × 2–3.5	10–15 × 3–4
Blade shape	Elliptical to obovate	Lanceolate	Lanceolate	Lanceolate to oblanceolate
Blade base	Rounded to subcordate	Attenuate	Obtuse	Attenuate
Leaf margin	Entire to denticulate	Entire to denticulate	Denticulate to serrate	Denticulate to serrate
Head position	Axillary	Axillary	Axillary	Alternate to the bracts
Peduncle length (mm)	–	2–10	–	–
Head size (mm)	12–15	10–12	10–12	11–13
Inner phyllaries apex	Aristate	Aristate	Acuminate	Aristate

*Etymology.* The specific epithet refers to the shape of the phyllaries (*longi* = large, *cuspis* = apex).

The new species can be easily separated from other taxa of the genus by the combination of petiolate leaves and aristate phyllaries. The latter character also occurs in other species of the genus such as *Lessingianthus cataractarum* (Hieron.) H. Rob. and *L. bardanoides* (Less.) H. Rob. However, *Lessingianthus longicuspis* can be distinguished by its petiolate leaves and the bracts of the inflorescence alternate to the heads (Table 2).

*Additional specimens examined.* BRAZIL. **Mato Grosso:** Serra Ricardo Franco, Mata da base da Serra, erva, beira de estrada, v 1978, *Marioni* s.n. (RB, n° 323636). **Mato Grosso do Sul:** Mun. Bodoquena, Rodovia Bodoquena – Morraria do Sul, subida para a Serra da Bodoquena, Ereta 1 m, flor lilas, 15 iii 2003, *G. Hatschbach, M. Hatschbach & E. Barbosa* 74804 (CTES, MBM); Mun. Bela Vista, Rod. BR-267, Córrego Caracol, Ereta 70 cm, capitulo lilas, orla do brejo, 11 iii 2003, *G. Hatschbach, M. Hatschbach & E. Barbosa* 74580 (CTES, MBM).

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