



A new species and a new combination in the South American genus *Lessingianthus* (Vernonieae, Asteraceae)

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Abstract

A detailed analysis of the type material of *Vernonia oxyodonta* clearly indicates that it is morphologically identical to *Lessingianthus glabratus* because it has glabrous leaves, pedunculate heads at the end of the inflorescence, outer phyllaries with acute apex and inner phyllaries with obtuse and mucronulate apex, and 30–40 florets per head. Consequently, all the specimens identified as *V. oxyodonta* are placed to a new species, *L. pubescens*. Also, *V. pseudoincana* is transferred to the genus *Lessingianthus*. This species belongs to the *L. rubricaulis* complex but can be distinguished from the remaining taxa of the group by its lanceolate leaves, grayish phyllaries, and habitat.

Key words: Compositae, taxonomy, *Vernonia*

Introduction

Lessingianthus Robinson (1988a: 939) is one of the largest genera of tribe Vernonieae Cassini (1819: 203), with 133 species distributed in South America including Argentina, Bolivia, Brazil, Colombia, Paraguay, Peru, Uruguay and Venezuela (Robinson 1999). The species are perennial herbs or shrubs with xylopodia, having medium or large-sized heads and seriate-cymose synflorescences (Robinson 1999). The genus comprises the species initially placed in *Vernonia* sect. *Lepidaploa* (Cassini 1817: 66) Candolle (1836: 26) subsect. *Macrocephalae* Benth (1873: 229). *Lessingianthus* can be distinguished from the remaining genera of the tribe by its apical anther appendages without glands, styles without basal node, cubic crystals on the ovary wall, and pollen type B (Dematteis 2006, Robinson 2007, Angulo & Dematteis 2010, 2014). The basic chromosome number of the genus is $x=16$, and the genus has the greatest number of polyploid species and the highest ploidy level within the tribe (Angulo & Dematteis 2012).

Since the description of *Lessingianthus* (Robinson 1988a), there have been a few problems in its generic limits. The single modification carried out by Dematteis (2007) has been the transfer of *Lessingianthus* subgen. *Oligocephalus* Robinson (1988a: 949) to the genus *Chrysolaena* Robinson (1988b: 956). After that, taxonomic studies carried out in this genus have focused on the description of new species and the resolution of nomenclatural specific problems (Dematteis 2006, 2008, Borges & Dematteis 2008, Dematteis & Angulo 2010, 2012). Nevertheless, several species still included in *Vernonia* have not been examined and, consequently, their taxonomic positions remain uncertain.

In this paper, after the intense herbarium revision of species still included in *Vernonia*, we conclude that an accepted species name, *V. oxyodonta* Malme (1932: 19), should be placed to the synonymy of *L. glabratus* (Lessing 1829: 294) Robinson (1988a: 943) because the type material of *V. oxyodonta* is morphologically referable to *L. glabratus*. All the other specimens recognized as *V. oxyodonta* constitute a separate species and, therefore, should be formally described as a new species. Additionally, one taxon previously placed in *Vernonia* as *V. pseudoincana* (Hieronymus 1897: 689) Cabrera (1999: 110) is transferred to *Lessingianthus*.

Materials and Methods

This study was based on a morphological analysis of the type specimens and additional specimens kept at BA, BAF, BM, BR, C, CESJ, CTES, CORD, G, ICN, K, LIL, LP, P, S and SI (acronyms according to Thiers 2012).

The terminology applied for the description of the species generally follows Robinson (1988a) and Dematteis (2007). The line drawings were done under camera lucida with a Leica MZ6 stereo microscope using pressed specimens.

Taxonomic treatment

1. New species

Lessingianthus pubescens M.B. Angulo and Dematteis, **sp. nov.** (Fig. 1).

Type:—PARAGUAY. Boquerón: Lolila, 50 km S del cruce Loma Plata con Ruta Trans-Chaco, 27 February 1991, *R. Vanni, A. Radovanicich & A. Schinini* 2418 (holotype CTES!, isotypes G!, C!).

Vernonia glabrata var. *puberula* Chodat (1902: 304). Type:—PARAGUAY. Central: “L’Assomption, dans les champs en friche,” February 1874, *B. Balansa* 778 (lectotype G!, designated by Ramella *et al.* 2009; isoelectotypes P!, S!)

Vernonia oxyodonta auct. non Malme: Cabrera & Klein (1980: 301–302).

Diagnosis:—*Lessingianthus pubescens* has a certain resemblance with *L. glabratus*, from which it differs by its 60–70 florets per capitulum (vs. 35–40 in *L. glabratus*), subulate phyllaries (vs. acuminate), sharply denticulate at the leaf margin (vs. serrate or denticulate), laxly pubescent (vs. glabrous or laxly pubescent) on the abaxial surface of leaves.

Erect shrub up to 1.5 m tall. Stem single, slightly pubescent or glabrous, up to 6 mm in diameter, leafy up to the synflorescence, internodes 1–2 cm long. Leaves subsessile, coriaceous, 12–13 × 2.5–4 cm. Leaf blades lanceolate, acute at apex, attenuate basally, sharply denticulate at the margin, scabrous above, laxly pubescent beneath, pinnatinervate, secondary veins prominent above. Capitula sessile or subsessile, grouped on seriate-cymose branches. Bracts of the synflorescence leafy, alternate to the heads, gradually reduced upwards, longer than the heads. Involucre ovoid-campanulate, 8–10 mm high. Phyllaries in 4–6 series, brownish, loosely imbricate, appressed, subulate at the apex, glabrous to pubescent at the apex, inner phyllaries linear-lanceolate, outer ones lanceolate. Florets violet, 60–70 per head. Corollas 12–14 mm long, lobes lanceolate, glabrous. Anthers sagittate, thecae 3–3.5 mm long, apical appendages ovate, 0.8 mm long. Styles 14–14.5 mm long, branches linear, 4 mm long. Cypselas turbinate, ribbed, slightly sericeous, 2.8–3.5 mm long. Pappus biseriate, white, inner bristles 6–7 mm long, outer scales lanceolate, fimbriate, 0.6–0.8 mm long. Pollen grains (type B) prolate-spheroidal, (P/E=1.01), tricolporate, echinolophate, 53.0 (54.7) 55.7 µm in diameter, spines 2.5–4 µm long, and lacunae 9.5 (10.6) 12.2 µm. 2n=128 (Dematteis 1997).

TABLE 1. Diagnostic morphological characters of *Lessingianthus pubescens* and *L. glabratus*.

	<i>L. pubescens</i>	<i>L. glabratus</i>
Leaf margin	sharply denticulate	serrate or denticulate
Abaxial surface of leaves	laxly pubescent	glabrous or laxly pubescent
Inner phyllary apex	coriaceous	membranaceous
Inner phyllary colour	brownish	purplish
Capitula	ovoid-campanulate	broadly campanulate
Florets per capitulum	60–70	35–40
Trichomes on corola lobe	absent	present
Apical anther appendage	ovate	lanceolate
Cypselas size (mm)	2.8–3.5	4–5

Etymology:—The specific epithet refers to indumentum type of the leaves.

Habitat and distribution:—*Lessingianthus pubescens* is common in Paraguay and rare in south of Brazil, in Santa Catarina and Rio Grande do Sul, growing on different soils.

Phenology:—Flowering and fruiting take place between October to May.



FIGURE 1. *Lessingianthus pubescens*. **A–B:** Plant. **C:** Capitulum. **D–E:** Inner phyllaries. **F–G:** Middle phyllaries. **H–I:** Outer phyllaries. **J.** Corolla. **K.** Corolla lobe apex. **L.** Cypsel with pappus. (A–L: from Vanni *et al.* 2418, CTES; illustrated by Mirtha L. Gómez).

Additional specimens examined:—PARAGUAY. Alto Paraná: Alto Paraná, 1910, *K. Fiebrig* 53 (G). Amambay: Colonia San Luis, 43 km N of route 5, road to Bella Vista, 13 December 1997, *M. Dematteis & A. Schinini* 876 (CTES, G). Caaguazú: ruta 2 a 5 km de Caaguazú, 8 February 1966, *A. Krapovickas et al.* 12198 (CTES, LP); 10–15 km N of Caaguazú, 19 February 1994, *T. M. Pedersen* 16080 (CTES, G, SI). Central: San Lorenzo, Ciudad Universitaria, November 1982, *E. Bordas* 1936 (CTES). Concepción: route 5, 28 km W of Concepción, 17 May 1974, *A. Schinini* 9067 (CTES). Misiones: Estancia La Soledad, 3 km of Santiago, 3 February 1988, *A. Schinini & R. Vanni* 26089 (CTES). Cordillera: Cerro Tobaty, March 1972, *A. Schinini* 4421 (CTES, G); Emboscada, December 1986, *E. Bordas* 1237 (CTES); Acosta Ñu, 4 km de Ytororo, hacia el río Paraguay, 16 October 1994, *A. Krapovickas et al.* 45653 (CTES). San Pedro: 36 km al N de San Estanislão, 8 February 1968, *A. Krapovickas et al.* 13964 (CTES, LP). BRAZIL: Rio Grande do Sul: Livramento, Morro Armour, 26 March 1976, *N. I. Matzenbacher* 484 (ICN). Santa Catarina: Mun. Urubici, rodovia Urubici-Urupema, 9 February 2007, *G. Hatschbach & O.S. Ribas* 79798 (CTES).

Discussion:—*Lessingianthus pubescens* has been treated in the flora of Paraguay (Cabrera *et al.* 2009) under the name *V. oxyodonta* Malme. A detailed analysis of the type material (*Malme* 1901, holotype S!) showed that this specimen has all the morphological characteristics of *L. glabratus* (Less.) H. Rob. and, consequently, it should be treated as a synonym of this species name. Therefore, the description of a new species that includes all specimens formerly placed under *V. oxyodonta* except for its type was necessary. Although *Vernonia glabrata* var. *puberula* Chodat has priority at the rank of variety, a new name may be used at the rank of species according to the International Code of Botanical Nomenclature (ICBN) Art. 11.2 (McNeill *et al.* 2012).

2. New combination

Lessingianthus pseudoincanus (Hieron.) Dematteis & Angulo, **comb. nov.** (Fig. 2).

Basionym:—*Vernonia rubricaulis* var. *pseudoincana* Hieronymus (1897: 689). Homotypic synonyms:—*Cacalia rubricaulis* var. *pseudoincana* (Hieron.) Kuntze (1898: 139). *Vernonia pseudoincana* (Hieron.) Cabrera (1999: 110). Type:—ARGENTINA. Córdoba, entre Malagueño y Córdoba, 13 January 1881, *G. Hieronymus s. n.* (lectotype BAF! designated by Cristóbal & Dematteis 2003; isoelectotypes BAF!, CTES!, G!, K!).

Vernonia rubricaulis var. *latifolia* Lessing (1829: 300). Type:—BRAZIL. Sine loco, *F. Sellow s. n.* (lectotype P!, designated by Dematteis 2004, isoelectotypes BR!, K!).

Vernonia salicifolia Gill. ex Hooker & Arnott (1836: 237), nom. nud. pro syn. [Argentina. Mendoza, *Gillies* 204 (BM!)].

Vernonia acutifolia var. *ambigua* Candolle (1836: 47). Type:—BRAZIL. Sine loco, *F. Sellow s. n.* (holotype G-DC!).

Vernonia rubricaulis var. *denudata* Baker (1873: 80). Type:—URUGUAY. Montevideo, *F. Sellow s. n.* (not found).

Vernonia rubricaulis var. *australis* auct. non Hieron.: Cabrera (1944: 319).

Erect shrub, 0.5–1 m high, with small xylopodia. Stem grayish, striate, 4–5 mm in diameter at the base, incanous-tomentose. Leaves sessile, coriaceous, 9–14 × 1.0–4 cm. Leaf blades narrowly lanceolate, acute at apex, attenuate basally, denticulate at the margin, rarely revolute, scabrous above, incanous beneath. Capitula sessile or subsessile, axillary, grouped in seriate-cymose branches. Bracts of the synflorescence leafy, linear. Involucre campanulate, 9–12 mm high. Phyllaries in 4–5 series, grayish, acute apically, sericeous, with long trichomes on the margins and apex, inner phyllaries lanceolate or oblong-lanceolate, outer ones ovate-lanceolate, recurvate. Florets violet, 30–40 per head. Corollas 12–13 mm long, lobes lanceolate, with glandular and non-glandular trichomes. Anthers sagittate, thecae 4.5–5 mm long, apical appendages lanceolate, 0.6–1 mm long. Styles 15–16 mm long, branches linear, 2.5–3 mm long. Cypselas turbinate, ribbed, slightly pubescent, 3–3.5 mm long. Pappus biseriate, white, inner bristles 6–6.5 mm long, outer scales lanceolate, fimbriate, 0.8–1 mm long. Pollen grains (type B) spheroidal, (P/E=1.00), tricolporate, echinolophate, 47.6 (50.2) 53.0 µm in diameter, spines 1.3–2.7 µm long, and lacunae 10.8 (11.7) 12.2 µm. 2n=64 (Angulo & Dematteis 2012).

Habitat and distribution:—*Lessingianthus pseudoincanus* is distributed from southern Bolivia and Paraguay to central Argentina, Uruguay, and Rio Grande do Sul, state of Brazil. The new species occurs in high fields with sandy soil.

Phenology:—Flowering and fruiting between October to April.

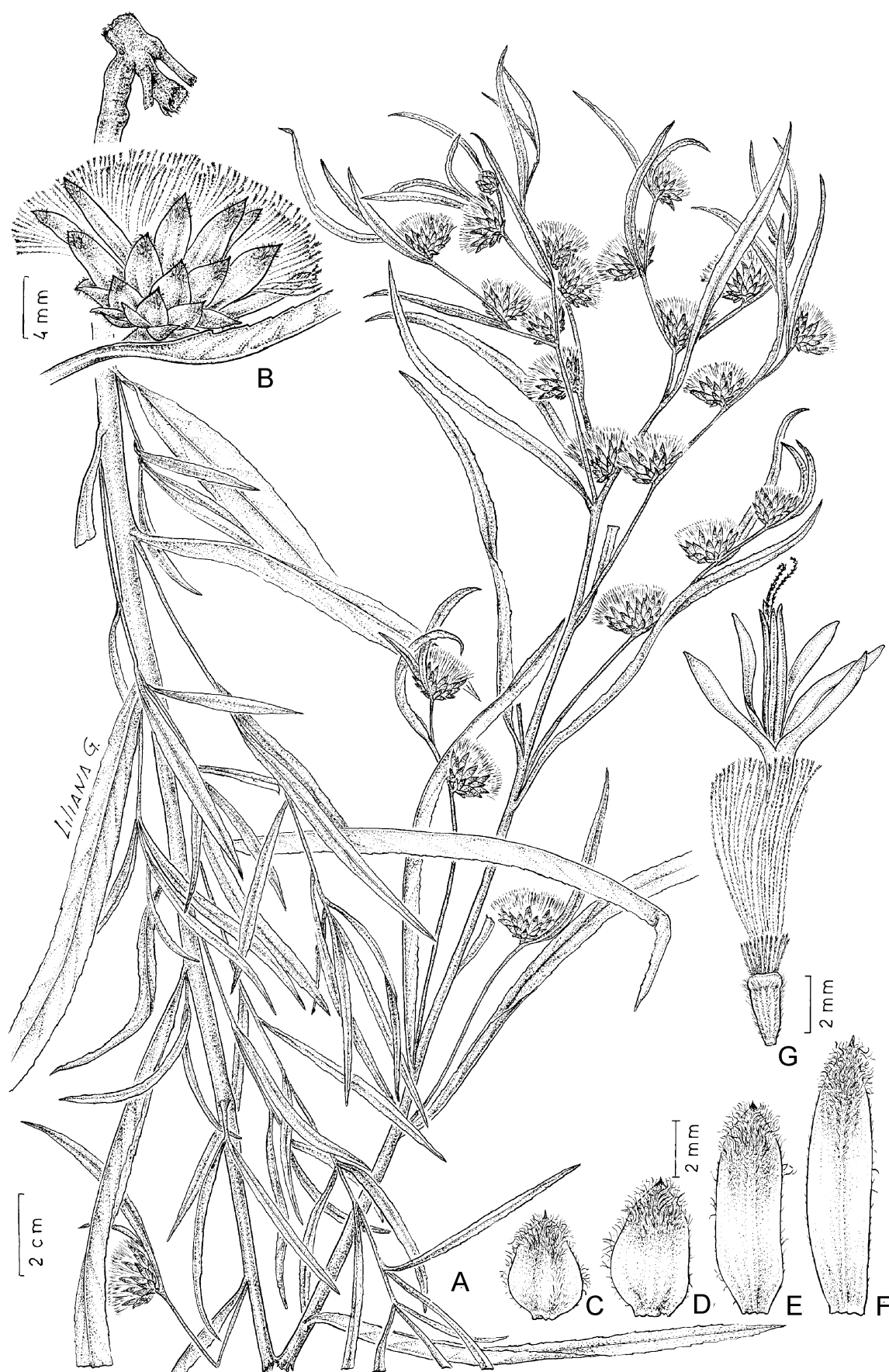


FIGURE 2. *Lessingianthus pseudoincanus*. **A.** Plant. **B.** Capitulum. **C–D:** Outer phyllaries. **E.** Middle phyllary. **F.** Inner phyllary. **G.** Immature cypsela with the rest of the flower. (A–G: from Mazzucconi 967, CTES; illustrated by Mirtha L. Gómez).

Additional specimens examined:—ARGENTINA. Buenos Aires: Chacabuco, 1936, *M. P. Urulay s. n.* (BA 19177); San Vicente, 25 December 1926, *Castellanos s. n.* (BA 26/1980); Entre Lincoln y General Pinto, 31 December 1928, *E. C. Clos 4139* (LP); Rosas, El Toro, 11 January 1926, *J. B. Daguerre 341* (BA); Monte Veloz, January 1929, *Pérez Moreau 8407* (BA); Pdo. Magdalena, Punta Indio, 28 December 1945, *A. P. Rodrigo 3476* (LP); Pdo. Merlo, alrededores de Libertad, 27 February 1955, *Mazzucconi 967* (CTES). Córdoba: Bajada de San Roque, 25 February 1939, *Castellanos s. n.* (BA 31378); prope Córdoba, February 1901, *T. Stuckert 10067* (BAF); Altos Sud cerca de Córdoba, 15 December 1896, *T. Stuckert 1012* (BAF, G). Corrientes: Bella Vista, 10 km S de Bella Vista, Ayo. Toropí, 27 January 2007, *M. B. Angulo 9* (CTES); Capital, alrededores de Corrientes, 1 March 1975, *C. Quarín 2965* (CTES); Capital, Molina Punta, 25-I-1996, *M. Dematteis & V. Solís Neffa 504* (CTES); Empedrado, Empedrado, Arroyo González y ruta 12, 27 February 1974, *C. Quarín et al. 2277* (CTES); Esquina, Guayquiraró, 26 February 1974, *C. Quarín et al. 2210* (CTES); Lavalle, Estancia La Pastoril, 25 March 1956, *T. M. Pedersen 3861* (C, CTES); ruta 12, 20 km S de ruta 123, 16 February 1996, *A. Krapovickas & C. L. Cristóbal 46518* (CTES); San Lorenzo, 19 January 1983, *T. M. Pedersen 13489* (CESJ, CTES); Saladas, Rio San Lorenzo, 10 December 1949, *G. J. Schwarz 9071* (LIL); San Alberto, Yapeyú, costa del Río Uruguay, 28 December 1944, *T. Ibarrola 1865* (LIL); San Cosme, 28 km E de Corrientes, ruta 12, 26 February 1978, *O. Ahumada 1649* (CTES); San Miguel, 19 km S de Caá Catí, ruta 5, 14 March 1978, *O. Ahumada 1796* (CTES); Chaco: Almirante Brown: Azarevich 74, aproximadamente 15 km N de Pampa del Infierno, 27 March 1978, *Bordón 640* (CTES); 1° de Mayo, Colonia Benítez, February 1937, *A. G. Schulz 9655* (CTES); Tapenagá, entre Characlay y Haumonia, 8 February 1952, *A. Ragonese & Castiglioni 8481* (CTES). Entre Ríos: La Paz, Complejo termal, circuito parque de la aventura, 3 January 2007, *H. A. Keller 3890* (CTES); Paraná, Parque San Martín, 22 December 1957, *A. L. Cabrera 12402* (C); Paraná, February 1917, *L. Hauman 4567* (BA); Pedernar, 05 April 1912, *Friedman 13* (LP). Formosa: Formosa, 2 km S de ruta 81, camino a Mariano Boedo, 20 February 1996, *A. Krapovickas & C. L. Cristóbal 46533* (CTES); Laishi, entre Tatané y Herradura, January 1979, *B. Piccinini & C. Petetin 3529* (CTES); Patiño, rutas 81 y 95, a 1 km de Cmte. Fontana, 15 January 1981, *C. A. Petetin & A. M. Molina 1131* (CTES); Pirané, Caco Cué, 7 February 1946, *I. Morel 875* (CTES). Mendoza: s. l. *Gillies 204* (BM). Salta: Capital, Chachapoyas, playa de maniobras de la Estación km 1129 del Ferrocarril General Belgrano, 4 October 1999, *Tolaba 2039* (CTES). Santa Fe: Capital: Santa Fe, 12 January 1949, *A. Ragonese & Castiglioni 6801* (CTES); General Obligado, Villa Ana, 23 December 1972, *C. Quarín 679* (CTES); San Cristóbal, R-92 al N de La Lucila, 10 December 1984, *Stofella 345* (CORD). Santiago del Estero: Moreno, Arbol Blanco, 15 November 1984, *Kunst et al. 101* (CTES). BOLIVIA. Tarija: Canto del Monte, prope Fortin Crevaux, Gran Chaco, 22 April 1902, *R. E. Fries 1685* (S). BRAZIL. Rio Grande do Sul: Caí, Capella, in campo, 23 April 1935, *B. Rambo 1968* (LP). PARAGUAY. Central: Trinidad, Asunción, February 1916, *T. Rojas 8644* (S). URUGUAY. Rocha: A° La Pantanosa, 5 February 1938, *P. Rossengurtt 2448* (LP).

TABLE 2. Comparison between *Lessingianthus pseudoincanus* and allied species.

	<i>L. pseudoincanus</i>	<i>L. rubricaulis</i>	<i>L. laniferus</i>	<i>L. pusillus</i>
Habitat	high fields, with sandy soil	low fields and flooded or waterlogged soil	high fields, with stony soil	high fields, with clayey soil
Plant height (cm)	50–100	80–200	50–130	30–50
Indumentum type	incanous	incanous	lanate	incanous
Leaf shape	narrowly lanceolate	linear	linear	linear or lanceolate
Leaf size (cm)	9–14 × 1.0–4	8–14 × 0.2–1	8–16 × 0.5–1.5	5–9 × 0.5–2
Leaf margin	denticulate and subrevolute	denticulate and subrevolute	entire and revolute	serrate or denticulate, never revolute
Involucre height (mm)	9–12	6–7	9–11	5–7
Phyllary colour	greyish	purplish	purplish	purplish
Apical anther appendage	lanceolate	lanceolate	ovate-lanceolate	ovate-lanceolate
Trichomes on fruit	glandular and non-glandular	glandular and non-glandular	glandular and non-glandular	non-glandular
Chromosome number	2n=64	2n=32, 64	2n=32, 64	2n=32

Discussion:—This species was initially described as a variety of *V. rubricaulis* (Hieronymus 1897), and then Cabrera & Dematteis (1999) elevated this taxon to the rank of species based on morphological and ecological observations. However, this entity was not included in *Lessingianthus* by Robinson (1988a, 1999). *Lessingianthus pseudoincanus* belongs to the *L. rubricaulis* (Humboldt & Bonpland 1809: 66) Robinson (1988a: 948) complex, which includes other three species with shortly seriate-cymose synflorescences, sessile capitula, 30–40 florets per head and linear to linear-lanceolate leaves, incanous to lanate beneath. However, *L. pseudoincanus* can be distinguished from the remaining taxa of the group by lanceolate leaves and grayish phyllaries. Besides, it grows in high fields with sandy soils, while *L. rubricaulis*, for example, grows in low and flooded fields. A comparison among *L. pseudoincanus* and closely related species is summarized in Table 2.

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