

## ***LORENTZIELLA* (GIGASPERMACEAE, BRYOPHYTA) NEW FOR CHILE, AND LECTOTYPIFICATION OF THE GENUS**

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**Summary:** The genus *Lorentziella* is reported for the first time for Chile based on multiple collections done between the months of July and September 2016. New information is given about the ecology of this taxon and its global known distribution, as well as a distribution map. A lectotype for the genus *Lorentziella* is here selected and the genus authorship is corrected.

**Key words:** Biogeography, ephemeral bryophytes, herbarium collections, Mediterranean climate.

**Resumen:** *Lorentziella* (Gigaspermaceae, Bryophyta) nuevo para Chile, y lectotipificación del género. El género *Lorentziella* es reportado por primera vez para Chile sobre la base de múltiples colecciones realizadas durante los meses de julio y septiembre de 2016. Se entrega información acerca de la ecología de la especie y su distribución mundial conocida, así como un mapa de distribución. Un lectotipo para el género *Lorentziella* es aquí seleccionado y se corrige la autoría del nombre.

**Palabras clave:** Biogeografía, briófitos efímeros, clima mediterráneo, colecciones de herbario.

### **INTRODUCTION**

The genus *Lorentziella* includes a single species characterized by winter ephemeral leafy gametophytes emerging from a subterranean perennial rhizome, and cleistocarpic capsules completely enclosed in the perichaetial leaves, containing large spores up to 180 µm in diameter. The aerial parts of the gametophytes are formed by rosettes of pellucid and concave, strongly imbricate leaves, with a single rather narrow costa that is excurrent as an awn. The plants when fully developed have a characteristic whitish-golden shine that makes the plants conspicuous from a distance. This taxon looks in the field like a large sterile *Bryum* species forming homogeneous clusters up to 30 cm in diameter (Fig. 1), but closer examination of the plants precludes any hesitation on its identification.

Although the name *Lorentziella* has been attributed to Müller (Müller, 1901; Brotherus, 1903; Lawton, 1953; Rushing, 2007; TROPICOS, 2017), it was initially validly published by Beschereille (1877). At that time, Beschereille described *Lorentziella paraguensis* Besch. and cited Müller's still unpublished manuscript. Thus, almost certainly unintentionally, Beschereille (1877) published a "descriptio generico-specifica" according to articles 38.5 and 38.6 of the International Code of Botanical Nomenclature (McNeill *et al.*, 2012).

Two years later Müller (1879) published his manuscript wherein he more fully described the genus *Lorentziella*, and described in detail two new species of this genus, *Lorentziella glauca* Müll. Hal. and *L. globiceps* Müll. Hal., based on material collected by Paul Gunther Lorentz. The type of the former was collected in 1877 at Concepción del Uruguay which is a city on the Argentine side of Río Uruguay. When providing a full description of the genus, Müller (1879) remarked on the similitude of this new taxon with the general habit of *Phascum* (Pottiaceae), with the subterranean perennial rhizome, large spores and general leaf morphology of *Gigaspermum* (Gigaspermaceae),

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and with the leaf areolation and immersed cleistocarpic capsules of *Archidium* (Archidiaceae). Müller (1888) subsequently published an additional species, *L. gibertii* Müll.Hal. from Uruguay.

The first name described in the currently accepted *Lorentziella* is *Leptangium imbricatum* (Mitten, 1869), based on a collection made by José Ernesto Gibert in Montevideo, Uruguay, on August 1868. This name was subsequently transferred to *Lorentziella* by Bortherus (1903) and is the oldest name available within the genus. All species described later are now considered synonyms of it (Lawton, 1953; Fife, 1980).

## MATERIAL AND METHODS

Several field trips were made throughout the Metropolitan and Valparaíso Regions of central Chile during the months of July-September 2016, during the Austral winter. The objective of these

trips was to document the ephemeral bryophyte flora that exists in this undercollected part of the country. Only the localities where *Lorentziella* was found are indicated below in the “observed specimens” section. All collected specimens are deposited in CONC herbarium. Historic collections of this taxon, as well as types for the different names available, were studied from NY, PC, and BM herbaria.

## RESULTS AND DISCUSSION

***Lorentziella*** Müll.Hal. ex Besch. *Mem. Soc. Sci. Nat. Math. Cherbourg* 21: 259. 1877. Type: *Lorentziella paraguensis* Besch. [Paraguay] Assomption, sur les pelouses. *Pl. du Paraguay*. - 1874-1877, Juillet 1876, B. Balansa 1258 (*Lectotypus* PC0696102! (selected here); *Isolectotypi* PC0696101!, BM000873341, NY00968181!, G00040419!).



**Fig. 1.** Field habit of *Lorentziella imbricata* (Mitt.) Broth., growing on bare soil in Reserva Nacional Lago Peñuelas (Larraín 40356, CONC).

***Lorentziella imbricata*** (Mitt.) Broth. *Nat. Pflanzenfam.* I(3): 511. 1903.

=*Leptangium imbricatum* Mitt., *J. Linn. Soc., Bot.* 12: 240. 1869. Type: Uruguay, Montevideo, Gibert 714 [*Lectotype* NY!, designated by Fife (1980); *Isolectotype* PC0696100!].

=*Lorentziella paraguensis* Besch., *Mem. Soc. Sci. Nat. Math. Cherbourg* 21: 259. 1877. Type: Paraguay, Asunción, Balansa 1258 (*Lectotypus* PC0696102!). Synonymized by Lawton (1953).

=*Lorentziella glauca* Müll.Hal., *Linnaea* 42: 229. 1879. Type: Argentina, Concepción del Uruguay, Lorentz s.n. (*Lectotypus* BM!). Synonymized by Fife (1980).

=*Lorentziella globiceps* Müll.Hal., *Linnaea* 42: 231. 1879. Type: Argentina, Sierra de Córdoba, Lorentz s.n. (*Lectotypus* BM!). Synonymized by Fife (1980).

=*Lorentziella gibertii* Müll.Hal., *Flora* 71: 13. 1888. Type: Uruguay, Montevideo, Gibert 1248 (*Lectotypus* BM!). Synonymized by Fife (1980).

=*Acaulon runyonii* Grout, *Bryologist* 48: 25. 1945. Type: U.S.A., Texas, Cameron County, North of Olmito, 2-II-1944, Runyon 3653 [*Lectotypus* NY01128002! (selected here)]. Synonymized by Lawton (1953).

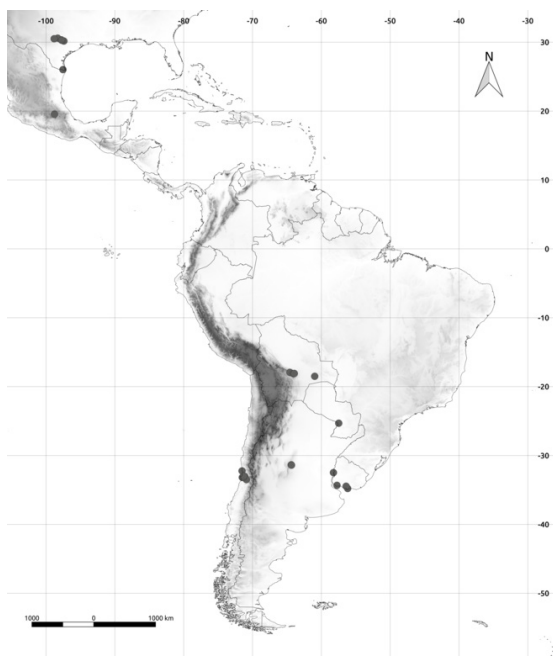
=*Acaulon megalosporum* Grout, *Bryologist* 48: 26. 1945. Type: U.S.A., Texas, on soil near Austin, VI-1941, McAllister s.n. (*Isotypi* NY, MICH, MO). Synonymized by Lawton (1953).

*Examined Material:* CHILE. *Región de Valparaíso. Provincia de Petorca, Comuna de La Ligua:* Los Molles, parque privado Puquén, entre matorrales de *Bahia ambrosioides*, *Baccharis*, *Lithrea caustica*, *Pouteria splendens*, *Fuchsia lycioides*, lat. 32°14'17.9"S, long. 71°31'19.4"W, 20 m s.n.m., 31-VII-2016, J. Larrain 40626 (CONC). *Provincia de Valparaíso, Comuna de Valparaíso,* Reserva Nacional Lago Peñuelas, en suelo de espinal de *Acacia cavendishii*, sendero "las orquídeas", lat. 33°10'57.7"S, long. 71°29'13.1"W, 350 m, 13-VII-2016, J. Larrain 40305 (CONC); 20-VII-2016, J. Larrain 40356 (CONC); *Comuna de Quilpué,* orilla de tranque junto a la Ruta F-50 entre Villa Alemana y Lo Orozco, a medio camino entre Los Quillayes y la viña Catrala, matorral abierto de *Lithrea*, *Colliguaja*, *Acacia* y *Trevoa*, lat. 33°10'01.0"S, 71°21'01.3"W, 259 m, 25-VII-2016, J. Larrain 40522 (CONC).

*Provincia de Marga-Marga, Comuna de Olmué,* sector Ojos Buenos, entre Lo Narváez y Quebrada Alvarado, en espinal de *Acacia cavendishii* entre la ruta F-10-G y el estero Pelumpen, sitio degradado, abierto, lat. 33°02'10.4"S, long. 71°07'45.8"W, 205 m, 22-VII-2016, J. Larrain 40459 (CONC); 40460 (CONC); *Comuna de Limache,* cerro La Huinca, en ladera seca con sabana de *Acacia cavendishii* y matorrales, lat. 32°58'35.5"S, long. 71°15'53.4"W, 380 m, 13-IX-2016, Larrain 40899 (CONC). *Región Metropolitana. Provincia de Santiago, Comuna de Maipú,* Rinconada de Maipú, Quebrada de la Plata, fundo Universidad de Chile, en matorral abierto de *Baccharis* y *Acacia cavendishii*, lat. 33°29'31.8"S, long. 70°53'14.6"W, 500 m, 23-VII-2016, J. Larrain 40467A (CONC); en ladera con matorral de *Baccharis* y *Colliguaja*, lat. 33°29'27.9"S, long. 70°53'19.2"W, 546 m, 23-VII-2016, J. Larrain 40496 (CONC).

The plants were found associated with dry shrubland vegetation dominated by *Acacia cavendishii* and shrubs like *Colliguaja*, *Lithrea*, *Trevoa*, *Bahia*, *Baccharis*, among others, and together with a rich bryophyte ephemeral flora composed of species of *Acaulon*, *Archidium*, *Barbula*, *Brachymerium*, *Cephaloziella*, *Costesia*, *Didymodon*, *Ephemerum*, *Fissidens*, *Fossombronia*, *Funaria*, *Gongylanthus*, *Pleuridium*, *Riccia*, *Sphaerocarpaceae*, *Syntrichia*, among many others.

Including these new findings, the currently known distribution of *Lorentziella* includes Uruguay, Paraguay, Argentina (Lawton 1953, Fife 1980), Bolivia (Fuentes & Muñoz 2002, Churchill & Fuentes 2005), Chile, central México (Cardenas & Delgadillo 1994) and Texas (Lawton 1953, Rushing & Snider 1980, Rushing 2007). This unusual distribution pattern is depicted in Fig. 2. In Chile *Lorentziella* has been so far found only in lowlands between sea level and 550 m, in both the western and eastern slopes of the central Chile coastal mountain range. It is probably a wide-spread but overlooked species of the whole Mediterranean zone of Chile, which ranges between 30-36°S. All South American collections of this taxon have been made between March and September, whereas the Texas collections have been made between January and March (with one outlier collected in June), and the Mexican collection was made in November.



**Fig. 2.** Distribution map of *Lorentziella imbricata* (Mitt.) Broth.

The name *Lorentziella uruguensis*, mentioned by Beschereille (1877) is a *nomen nudum*. Beschereille's publication of this *nomen nudum* may be due to differences between the manuscript by Müller he cited and the final published paper (Müller 1879), where the two relevant species of *Lorentziella* described were *L. glauca* and *L. globiceps*.

It is interesting that such a conspicuous, peculiar, and regionally well-documented moss as *L. imbricata* has not yet been reported to Chile. During our field trips this taxon was found at almost every visited site, sometimes being the dominant cryptogam species on the ground cover in certain habitats like *Acacia caven* open savanna, even next to highways and other heavily disturbed places. Although very little is known about the ecology of the South American populations of this taxon or other central Chilean ephemeral bryophyte taxa, Rushing (2007) described the above-ground parts of the gametophytes of Texan *L. imbricatum* as winter plants completely disappearing by late spring. Maybe the plants only sprout when ideal humidity conditions occur. Unusual meteorological conditions prevailed in Central Chile in autumn and early winter 2016 due to a strong El Niño event.

*Lorentziella imbricata* shares a remarkable similarity in the general morphology and the life cycle of *Gigaspermum repens* (Hook.) Lindb. as documented by Seppelt *et al.* (2012). The main difference between these two taxa is the capsule morphology, which is stegocarpous and gymnostomous in *Gigaspermum* but cleistocarpic in *Lorentziella*.

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