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NEW RECORD AND ADDITIONS TO THE ARGENTINEAN BRYOPHYTE FLORA

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Abstract. Fuertes, E. & C. Prada. 2014. New record and additions to the Argentinean bryophyte flora. *Darwiniana*, nueva serie 2(1): 68-73.

Steereella lilliana is reported as a new record for the bryophyte flora in Argentina and South America. Furthermore, the distribution of *Frullania brasiliensis* in Argentina, previously known only from Misiones and Salta, is expanded to the provinces of Tucumán and Córdoba. Additionally, *Stephaniella paraphyllina*, is new to the province of San Luis, collected in Sierra de Comechingones, and this represents its southernmost distribution. Brief comments about morphological characters, keys to related species in Argentina, as well as habitat details are given.

Keywords. Argentina; bryophyte flora; distribution; ecology; *Frullania*; Marchantiophyta; *Steereella*; *Stephaniella*.

Resumen. Fuertes, E. & C. Prada. 2014. Nueva cita y novedades para la flora briofítica argentina. *Darwiniana*, nueva serie 2(1): 68-73.

Steereella lilliana se registra como una nueva cita para la flora briofítica de Argentina y Sudamérica. Además, se amplía la distribución de *Frullania brasiliensis* en Argentina, antes solo conocida para las provincias de Misiones y Salta, y ahora presente en las provincias de Tucumán y Córdoba. A su vez, *Stephaniella paraphyllina*, es una novedad para la provincia de San Luis, recolectada en la Sierra de Comechingones, representando éste su límite sur de distribución. Se aportan comentarios sobre la morfología, claves para las especies cercanas en Argentina y datos de hábitat.

Palabras clave. Argentina; distribución; ecología; flora briofítica; *Frullania*; Marchantiophyta; *Steereella*; *Stephaniella*.

INTRODUCTION

During a bryological study of the Marchantiophyta collected in field expeditions to northern Argentina between 2007 and 2011, three species belonging to genera *Steereella* Kuwah. (Metzgeriaceae, Metzgeriales), *Frullania* Raddi (Frullaniaceae, Jungemanniales) and *Stephaniella* J. B. Jack (Arnelliaceae, Jungemanniales) were found.

According to Gradstein et al. (2001) the Jungermanniales order is the largest of Hepaticae; about 1000 species are present in tropical America; species of this order are plants with leaves and they are therefore called "leafy liverworts". *Frullania* species are usually epiphytes, occurring in lowland rainforests, and montane forests, in wet and humid habitats, while *Stephaniella* species grow on soils and rocks, in montane habitats. The Metzgeriales species are usually "thalloid plants"; the thallus has a thick and flattened central midrib and

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thinner lateral wings undivided or more or less dissected into lobes. This is the second largest order of Hepaticae in tropical America, with about 150 species.

In the checklist devoted to Marchantiophyta of Argentina, Chile and Uruguay (Hässel de Menéndez & Rubies, 2009) the presence of *Steereella lilliana* (Stephani) Kuwahara is not mentioned, and the distribution of *Stephaniella paraphyllina* J. B. Jack. and *Frullania brasiliensis* Raddi does not include the areas in which those species were collected for this study.

The study area covers mainly three phytogeographic provinces: Yungas, Paranaense, and Chaco (Cabrera, 1994). The objective of this contribution is to present a new record for South America and new distribution data of these liverworts in Argentina. Brief comments about morphological characters, keys to related species in Argentina, as well as habitat details are given.

MATERIAL AND METHODS

Taxonomy and nomenclature follow Crandall-Stotler et al. (2008); the identification of specimens is according to Schmitt & Winkler (1968), Stotler (1969), Kuwahara (1986), Schuster (2002), and Uribe-M. & Gradstein (2003). Aspects concerning the ecology and chorology of each species are according to the aforementioned authors and Spruce (1884), Jack (1894), Gradstein et al. (2001), Hässel de Menéndez & Rubies (2009), Gradstein & Uribe-M. (2011) and our own observations. Specimens examined are from our own collections and have been deposited in herbaria BA, MACB, MO, and NY (Thiers, 2014).

RESULTS

METZGERIACEAE Klinggr.

Steereella lilliana (Stephani) Kuwahara, Bryophyt. Biblioth. 28: 179. 1986. *Metzgeria lilliana* Stephani, Sp. Hepat. 6: 53. 1917. TYPE: Jamaica, Giddy Halls, VIII-1909, *J. Maxwell, G 9878* (holotype G00069940 image!).

Iconography. Kuwahara (1986: fig. 75, a-h; fig. 76, a-i; fig. 77, a-k).

Distribution and habitat. Neotropical. It occurs in Central America, in Cuba and Jamaica (Kuwahara, 1986; Costa, 2008). This contribution is a new record in Argentina and also in South America (Fig. 1). Kuwahara (1986) refers a sample from Jamaica as living on trees, and the sample from Cuba as living on coffee trees. In Argentina, this species is found forming lax mats on the bark of the trees, with other bryophytes, in the yungas montane forest, between 750-2000 m; it grows in mesophilous and hygrophilous habitats.

Observations. The studied plants are pale-green when wet, and yellowish green when dry. They are usually prostrate, with a dorsiventral thallus, 20-50 x 0.80-1.20 mm, without hairs; section of thallus shows the lamina and the border unistratose throughout; border cells have thickened walls, clearly distinct from the rest of the lamina, and single spines, 15-35 µm long; the spines are sparsely distributed along the marginal cells. In the reviews of the Neotropical Metzgeriaceae (Kuwahara, 1986; Costa, 2008) just five herbarium sheets are cited, most of them collected over 100 years ago, which indicates the poor representation of the species in herbaria.

This is the first record of *Steereella lilliana* for Argentina and South America**.**

Specimens examined. ARGENTINA. **Jujuy.** Depto. Ledesma, Parque Nacional de Calilegua, selva montana de Myrtaceae, "yungas", 23º44´S 64º55´W, 760 m, 6-V-2007, *Fuertes & Prada s.n.* (MACB 105764). **Tucumán.** Depto. Chicligasta, Sierra de Aconquija, paraje Las Banderitas, epífita en forófitos del bosque montano con *Alnus acuminata*, 27º18´S 5º54´W, 1950 m, 22-VI-2007, *Fuertes & Prada s.n.* (BA, MACB 105502).

FRULLANIACEAE Lorch.

Frullania brasiliensis Raddi, Critt. Bras. 12. 1822 [preprint], Mem. Mat. Fis. Soc. Ital. Sci. Modena 19: 36. 1823. TYPE: Brazil, Rio de Janeiro, Rio de Janeiro County, "Trovasi fre-

quentemente sulle Montagne suddette, ed anche sul Corcovado", *G. Raddi s.n.* (holotype PI; isotypes, FI, NY).

Jungermannia mucronata Lehm. & Lindenb., Nov. Stirp. Pug. 6: 54. 1834. *Frullania mucronata* (Lehm. & Lindenb.) Lehm. & Lindenb., Syn. Hepat. 461. 1844[-1847]. TYPE: Peru, *Poeppig s.n.* (holotype W, Herbarium Kunze).

Iconography. Stotler (1969: figs. 57-67, plate 8), Gradstein et al. (2001: fig. 27 f), Costa (2008: fig. 57, A-Q), Gradstein & Uribe-M. (2011: fig. 3).

Distribution and habitat. Neotropical. *Frullania brasiliensis* is a common and widespread species in tropical America (Gradstein & Uribe-M., 2011). In Argentina, *F. brasiliensis* is a noteworthy leafy liverwort; it was first cited for the province of Salta by Jack & Stephani (1895) in "Cuesta de San Rosa and Rio Seco pr. San Andrés, Orán". Later, Drehwald (1995) mentioned the species in the epiphytic communities of *Leptodontio-Schlotheimietum rugifoliae*, in Misiones (Depto. General Belgrano, Depto. Candelaria, and Depto. Iguazú). In both cases, herbaria specimens were not mentioned. In this contribution, specimens from Salta and Misiones are cited, and its presence in Tucumán and Córdoba provinces is reported for the first time. So, this species is distributed broadly in northern Argentina (Fig. 1). *Frullania brasiliensis* usually grows as appressed mats, on bark of trees (Stotler, 1969), logs, soil or rocks (Gradstein & Uribe-M., 2011). In Argentina, it grows as epiphyte on tree trunks, on *Alnus acuminata* Kunth and *Ficus maroma* A. Cast., or on trunks of the tree fern *Alsophila odonelliana* (Alston) M. Lehnert., in yungas montane forests, between 590-1900 m. It has been found in the NE Argentinean Atlantic forests together with *Araucaria angustifolia* (Bertol.) Kuntze and tree ferns as *Cyathea atrovirens* (Langsd. & Fisch.) Domin, at 500-550 m. In Cór-

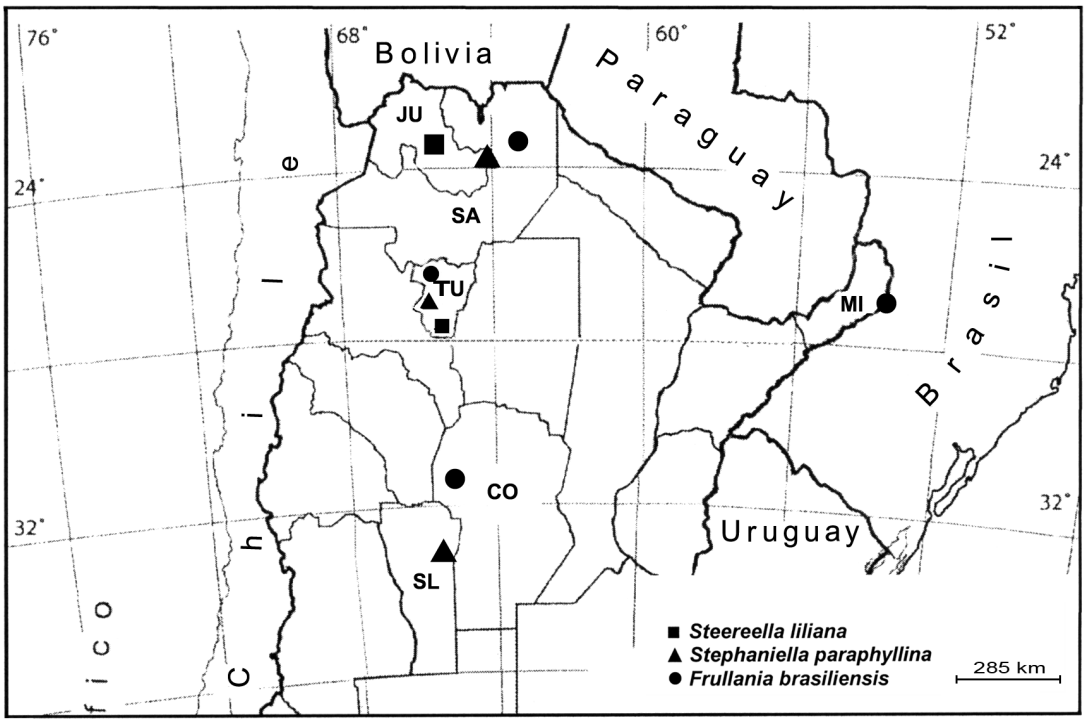

Fig. 1. Distribution map of *Steereella lilliana*, *Stephaniella paraphyllina*, and *Frullania brasiliensis* in Argentina. Map modified from Matteri (2003). Abbreviations of provinces: CO, Córdoba; JU, Jujuy; MI, Misiones; SA, Salta; SL, San Luis, TU, Tucumán.

doba province, *F. brasiliensis* is a rare species; it grows on crevices and hollows of acidic rocks, at 2000 m or more, where the lycophyte *Huperzia saururus* (Lam.) Trevis. is common.

Observations. *Frullania brasiliensis* is the only species of subgenus Thyopsiella Spruce that occurs in Argentina. According to Gradstein & Uribe-M. (2011) this subgenus is characterized by more or less convolute stem leaves, appressed to the stem when dry, spreading when moist; dorsal leaf lobe longer than broad; auricles at leaf base lacking or not similar in size, the dorsal auricle distinctly larger than the ventral one, and perianth surface smooth.

The examined specimens are brown-reddish to dark-brownish plants, 5-12 cm long; the stem is irregularly 1-2-pinnately branched. Leaves are incubus, bilobed to the base, with a large dorsal lobe, irregularly reniform, concave, arching over the stem, 0.80-0.85 x 0.75(-0.78) mm, with the apex obtuse, mucronate and margin entire, recurved; the ventral lobe is smaller, helmet-shaped, 0.24 x 0.10 mm, and with a small uniseriate stylus between lobe and stem, 3-4 celled, without foliose appendage. The perianth is oblonge-cylindric, terete, with a few weak folds above.

Frullania brasiliensis is a dioicous species that exhibits a wide range of morphological variation, resulting in a superposition of some characters with several other Neotropical species (Stotler, 1969). Due to this variability, sterile plants can be easily misidentified, mainly with *F. intumescens* (Lehm. & Lindenb.) Lehm. & Lindenb. or *F. atrata* (Sw.) Dumort., both species not mentioned so far for the bryophyte flora of Argentina.

Specimens examined. ARGENTINA. **Córdoba.** Depto. San Alberto, cordilleras pampeanas, Sierras Grandes de Córdoba, Ruta 34, Pampa de Achala, desde El Cóndor hacia Copina, 31º 37' S 64º 40' W, 2100 m, 22-VI-2007, *Fuertes, Passarelli & Prada s.n.* (MACB 104209, MO, NY). **Misiones.** Depto. San Pedro**,** Parque Regional Cruce Caballero, 26º42´S 53º57´W, 500-550 m, 14-IX-2008, *Fuertes, Oliván & Prada s.n.* (BA, MACB 104203, MO, NY). **Salta.** Depto. Orán, Reserva de San Andrés, camino al paraje de Las Maromas, pr. Río Blanquito, 23º07´S 64º37´W, 850-950 m, 17-VI-2008, *Fuertes & Prada s.n.* (BA, MACB 101674, MO, NY); paraje Los Naranjos, 23º10´S 63º29´W, 590 m, 17-VI-2008, *Fuertes & Prada s.n.* (MACB 104204, NY). Depto. Santa Victoria, Parque Nacional Baritú, paraje El Nogalar, pr. Los Toldos, 22º18´S 64º39´W, 1590-1640 m, 28-VI-2007, *Fuertes & Prada s.n.* (BA, MACB 104205, MO, NY). **Tucumán.** Depto. Chicligasta, Sierra de Aconquija, subiendo a Las Banderitas, 27º18´S 65º54´W, 1845-1860 m, 22-VI-2007, *Fuertes & Prada s.n.* (BA, MACB 104202, MO, NY).

Key to species of *Frullania* subgenus Thyopsiella similar to *F. brasiliensis*

1. Dorsal lobe of stem leaf plane, apex acute to breifly apiculate, perianth pyriform, 3-keeled ..... *F. atrata*
1. Dorsal lobe of stem leaf distinctly recurved, apex mucronate or apiculate, perianth abruptly narrowed to a long-cylindrical beak 2
2(1). Stylus with a foliose appendage; perianth oblong-obovoid, broadly to sharply 3-keeled .... *F. intumescens*
2. Stylus without foliose appendage; perianth oblong-cylindrical, terete ..... *F. brasiliensis*

ARNELLIACEAE Nakai

Stephaniella paraphyllina J. B. Jack., Hedwigia 33: 11. 1894. TYPE: [Argentina, Salta] "Cienega in alpibus Argentino-Bolivianis, in solo glareoso-lutoso", 1873, *P. G. Lorentz s.n.* (lectotype G 00120479 image! designated by Juárez-Martínez, Phytotaxa 159: 129. 2014; isolectotypes G, M).

Iconography. Jack (1894: figs. 1-8), Schmitt & Winkler (1968: Abb. 1 a-e; Abb. 3), Schuster (2002: figs. 1-7).

Distribution and habitat. *Stephaniella paraphyllina* grows in Africa and America (Gradstein, 2013). In Africa it has been reported in South Africa, and Natal-Lesotho (Schmitt & Winkler, 1968; Schuster, 2002). In America it is distributed in Mexico, Costa Rica, Venezuela, Colombia, Ecuador, Peru, Bolivia, Brazil, and Argentina (Schuster, 2002). The type locality was not indicated; howev-

er, Hässel de Menéndez & Rubies (2009) referred the type material to Salta province, and also indicated the species for Jujuy based on data of Jack & Stephani (1895) and Kühnemann (1949). In Argentina, it has been also reported for Tucumán province (Schmitt & Winkler, 1968). The presence of *S. paraphyllina* in Sierra de Comechingones is a new record for San Luis province, and represents the southernmost locality for the species in South America (Fig. 1). *Stephaniella paraphyllina* is especially adapted to extreme conditions. It grows as saxi-terricolous in hollows or slight depressions of acidic rocks, in open sites exposed to wind, sun, rain or snow, with *Polytrichum juniperinum* Hedw., *Tortula* Hedw. species, and *Teloschistes* Norman species.

Observations. At present, three species of *Stephaniella* have been reported for Argentina: *S. paraphyllina* from Salta, Tucumán, and San Luis, *S. hamata* Stephani from Córdoba, and *S. uncifolia* Winkler, without precise locality [Type *Argentinien, leg. Lorentz,* Herbar Stephani, M (fide Schmitt & Winkler, 1968)].

Specimens examined. ARGENTINA. **San Luis.** Depto. Junín, Sierra de Comechingones, Mirador de los Cóndores, pr. Villa de Merlo, 32º23´S 64º55´W, 2.270 m, 28-X-2011, *Fuertes & Prada s.n.* (BA, MACB 103451, MO).

Key to species of *Stephaniella* in Argentina

1. Paraphyllia uniseriate, rarely bifurcate; leaf margin clearly incurved to the apex .....…… *S. paraphyllina*
1. Paraphyllia biseriate or laminar; leaf margin not or slightly incurved ….....……. 2
2(1). Leaf apex rounded, ventral margin almost plane ……..……..... *S. hamata*
2. Leaf apex pointed, suddenly narrowed in a sharp point; ventral margin distally incurved .... *S. uncifolia*

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