



# *SYNTRICHIA PAPILLOSA* (WILSON EX SPRUCE) SPRUCE (POTTIACEAE) IN COLOMBIA

## *SYNTRICHIA PAPILLOSA* (WILSON EX SPRUCE) SPRUCE (POTTIACEAE) EN COLOMBIA

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### SUMMARY

**Background and aims:** During the study of the bryoflora of Bogotá, individuals of *Syntrichia papillosa* were found in urban localities. The aim of this contribution is to confirm the presence of this epiphytic species to the Colombian flora.

**Materials and methods:** Living plants and herbarium material from the Natural History Museum (BM), the New York Botanical Garden (NY) and Jardín Botánico José Celestino Mutis (JBB) herbaria, were analyzed. Recently collected specimens were deposited in JBB.

**Results:** A conspectus of the morphological features of the species based on herbarium specimens are provided, along with morpho-anatomical photographs. Further, the presence of the species in different localities belonging to the area around Bogotá was confirmed.

**Conclusion:** This paper confirms the presence of *Syntrichia papillosa* in the surroundings of Bogotá. This species is known from Asia, Australia, Europe, New Zealand, North America, Africa, Argentina, Bolivia, Brazil, Colombia, Chile, and Ecuador. Thus, the genus *Syntrichia* is represented in Colombia by eight taxa: *S. andicola*, *S. bogotensis*, *S. breviseta*, *S. fragilis*, *S. kingii*, *S. lacerifolia*, *S. laevipila* and *S. papillosa*.

### KEY WORDS

Bogotá, Colombia, mosses, Pottiaceae, *Syntrichia papillosa*, urban.

### RESUMEN

**Antecedentes y objetivos:** Durante el estudio de la brioflora de Bogotá, se encontraron individuos de *Syntrichia papillosa* en localidades urbanas. El objetivo de esta contribución es confirmar la presencia de esta especie epífita en la flora colombiana.

**Materiales y métodos:** Se analizaron plantas vivas y material de herbario de los herbarios del Natural History Museum (BM), New York Botanical Garden (NY) y del Jardín Botánico José Celestino Mutis (JBB). Los ejemplares recolectados recientemente fueron depositados en JBB.

**Resultados:** Se presenta un resumen de las características morfológicas de la especie a partir de especímenes de herbario, junto con fotografías morfoanatómicas. Además, se confirmó la presencia de la especie en diferentes localidades del área de Bogotá.

**Conclusión:** Este trabajo confirma la presencia de *Syntrichia papillosa* en los alrededores de Bogotá. Esta especie se conoce en Asia, Australia, Europa, Nueva Zelanda, América del Norte, África, Argentina, Bolivia, Brasil, Colombia, Chile y Ecuador. Así, el género *Syntrichia* está representado en Colombia por ocho taxones: *S. andicola*, *S. bogotensis*, *S. breviseta*, *S. fragilis*, *S. kingii*, *S. lacerifolia*, *S. laevipila* y *S. papillosa*.

### PALABRAS CLAVE


Bogotá, Colombia, musgos, Pottiaceae, *Syntrichia papillosa*, urbanos.

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## INTRODUCTION

The diversity of mosses in Colombia is estimated at 950 species, but the number could be higher if floristic studies were increased (Churchill, 2016), considering that there are unexplored environments and localities. Currently there are a significant number of species listed for the country that are known by one or a few specimens or only from the type locality (Churchill, 1989). A considerable number of the unique specimens were collected in the XIX century in what today is known as the region of the Sabana of Bogotá and surroundings (Florschütz de Waard & Florschütz, 1979).

The Pottiaceae family is one of the most diverse families in the world with around 76 genera and more than 1.400 species (Zander, 1993). It represents one of the most important groups of the Colombian flora, not only because it is the richest in number of genera (Churchill, 2016), but also because of the complexity of methods involved in examining its specimens (Churchill & Linares, 1995).

The genus *Syntrichia* Brid. is currently represented in Colombia by nine species: *S. andicola* (Mont.) Ochyra, *S. bogotensis* (Hampe) Mitt. ex R.H. Zander, *S. fragilis* (Taylor) Ochyra, *S. kingii* (H. Rob.) M.T. Gallego & M.J. Cano, *S. lacerifolia* (R.S. Williams) R.H. Zander, *S. amphidiacea* (Müll. Hal.) R.H. Zander, *S. laevipila* Brid. (as *S. pagorum* (Milde) J.J. Amann), *S. papillosa* (Wilson ex Spruce) Spruce, and *S. percarcosa* (Müll. Hal.) R.H. Zander (Churchill, 2016; Delgadillo *et al.*, 1995; Gallego *et al.*, 2011, 2014). This is a small number considering that South America may be the center of the diversity of the genus for which about 90 species are currently known (Gallego *et al.*, 2022). Recently Gallego *et al.* (2022) placed *Syntrichia amphidiacea* in the genus *Streptopogon* Wilson ex Mitt., and considered *S. breviseta* (Mont.) M.J. Cano & M.T. Gallego and *S. percarcosa* to be conspecific, with the former name having priority.

*Syntrichia papillosa* is known from Asia (Kürschner & Edgar, 2005; Gulnigaret *al.*, 2018), Australia (Catcheside, 1980), Europe (Hill *et al.*, 2006; Hodgetts *et al.*, 2020), Islas Malvinas (Matter, 1986), New Zealand (Fife, 1995), North America (Mishler, 2007), and Africa (O'Shea, 2006). In South America it has been reported to Argentina (Matter, 2003), Bolivia (Churchill & Fuentes, 2005), Brazil (Yano, 1995), Chile (Müller, 2009), Ecuador (Mitten, 1869) and Colombia (Delgadillo *et al.*, 1995). For

the latter country, Delgadillo *et al.* (1995) did not include any references or information about any herbarium specimens. On the other hand, in the regional (Churchill *et al.*, 2000) and national catalogs (Robinson, 1967; Florschütz de Waard & Florschütz, 1979; Churchill 1989, 2016) the presence of this species in Colombia was not reported. The above references show the lack of information regarding the presence of *Syntrichia papillosa* in Colombia. The focus of this study is to provide herbarium evidence to support the occurrence of this species in Colombia.

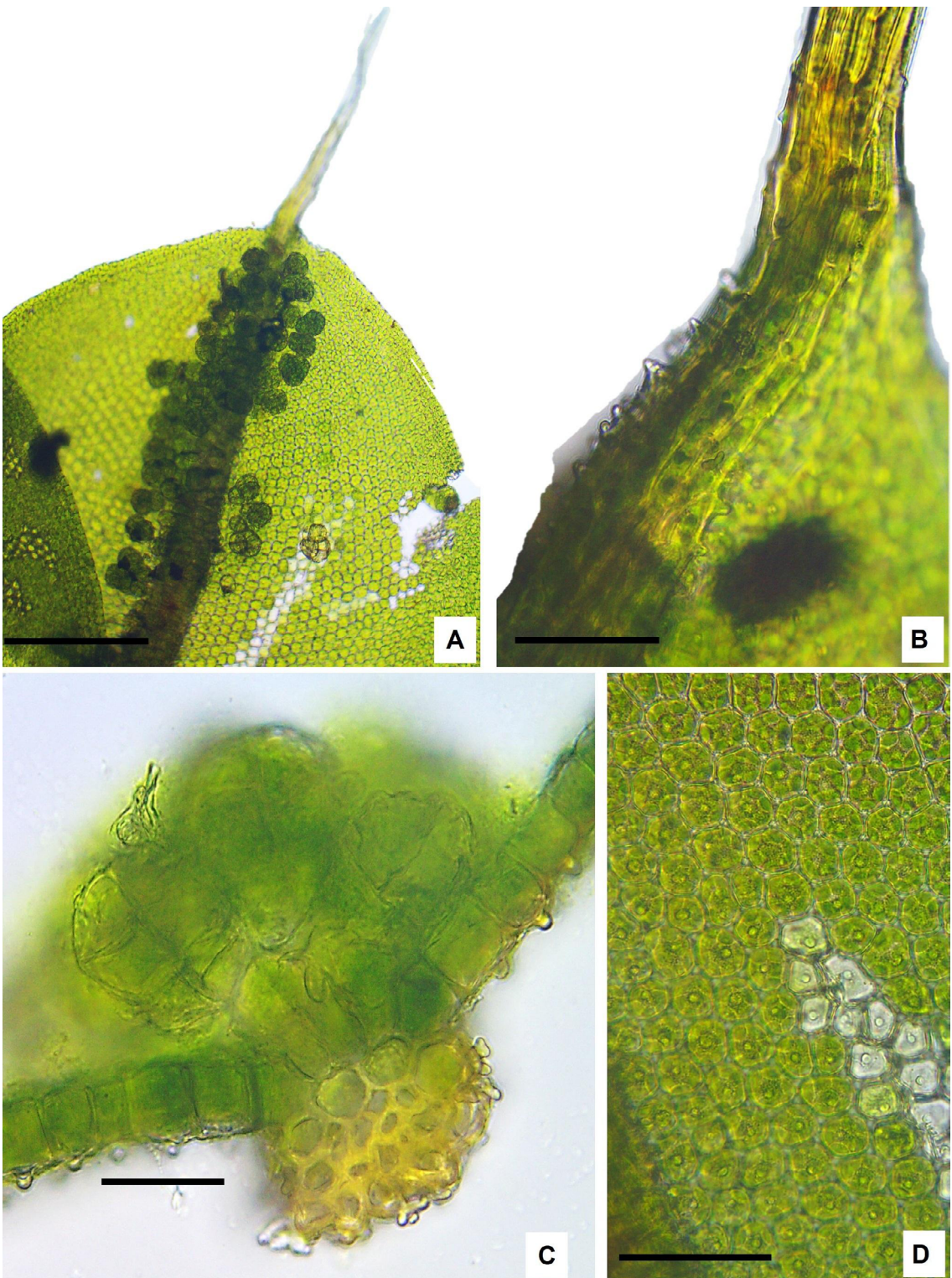
The study of the urban and rural bryoflora of the city of Bogotá, as part of the curatorial processes of the collection of bryophytes in the Herbarium of the Bogotá Botanical Garden (JBB), has allowed the first author to identify two distinctive specimens of *S. papillosa* near the football stadium 'El Campin' and the urban park 'El Virrey'. Furthermore, during the taxonomic studies of the South American species of *Syntrichia*, the second and third authors reviewed and updated the identification of two specimens collected in Colombia, which proved to be *S. papillosa*. Therefore, the specimens reported here confirm the presence of this taxon in the Colombian moss flora

## MATERIALS AND METHODS

The specimens were studied with the typical anatomical and morphological methods used for Pottiaceae (Zander, 1993). Microscopic examinations and measurements were carried out with an Olympus BX41 light microscope (Olympus Corp., Tokyo, Japan) and AmScope LED microscope. Microphotographs were obtained with an AmScope MU1003 camera (AmScope, California, USA) mounted on the microscope. Specimens were examined in 2% KOH solution.

## RESULTS AND DISCUSSION

*Syntrichia papillosa* is characterized by the presence of propagules on the ventral surface, the costa strongly papillose on the abaxial surface, unbordered leaf margins and simple papillae occurring only on the ventral surface of the leaves. The Colombian plants did not possess sporophytes and were morphologically identical to other specimens of *S. papillosa* studied from other geographical areas (Fig. 1). Fertile



**Fig. 1.** *Syntrichia papillosa*, Aponte 414 (JBB). **A:** Leaf apex, ventral surface. **B:** Coastal dorsal surface. **C:** Costa in transverse section. **D:** Dorsal leaf surface. Scales: A: 0.5 mm, B-D: 10  $\mu$ m.

specimens have been registered in Australia, New Zealand, Tasmania, and North America (Dixon, 1923; Catcheside, 1980; Mishler, 2007). Despite Sim (1926) cites the taxon with sporophytes from Australasia, he does not give a precise locality.

*Specimens examined:* COLOMBIA. Dpto. Cundinamarca: *Bogotá D.C.*, Bogotá, Hampe s.n. (BM000729340, as “*Barbula scabrinervis?*”); Chapinero, Urban space Parque ‘El Virrey’, III-2018, Montoya & Del Risco 36 (JBB); Teusaquillo. Urban Park ‘El Campin’, 13-V-2022, Aponte Rojas 414 (JBB); near Zipaquirá (unknown locality at Bogotá’s Savannah), III-1951, Schultes & Bell 11417 (NY, as *Tortula papillosa*, identified by H.A. Crum, Feb. 1956).

## CONCLUSION

This paper confirms the presence of *Syntrichia papillosa* in the surroundings of Bogotá. Thus, the genus *Syntrichia* is represented in the country by eight taxa: *S. andicola*, *S. bogotensis*, *S. breviseta*, *S. fragilis*, *S. kingii*, *S. lacerifolia*, *S. laevipila* and *S. papillosa*.

## AUTHOR CONTRIBUTIONS

AMA found the recent specimens from Bogotá, invited the writing of the publication, and proposed the first version of the manuscript, MTG and MJC confirmed the identity of the specimen, reported the lack of information about the species, included the background and knowledge from their expertise. All authors have read and contributed to writing the final manuscript.

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