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A new species of *Scopinella* from pampas grass in Argentina

Romina M. Sánchez, Lucrecia Giordano,
Freda E. Anderson & M. Virginia Bianchinotti*

Centro de Recursos Naturales Renovables de la Zona Semiárida,
Universidad Nacional del Sur Camino,
La Carrindanga Km 7, B8000FWB, Bahía Blanca, Argentina

* Correspondence to: *vbianchi@uns.edu.ar*

Abstract — A previously undescribed species of the genus *Scopinella* was found during a survey of the fungi associated with *Cortaderia selloana* (*Poaceae*) in Argentina. The ascospores are strongly asymmetrical and have the shape of a truncated pyramid with a convex quadrangular base. This peculiar ascospore shape sets this species, described here as new, apart from the others of the genus. This is the second record of *Scopinella* from South America.

Key words — ascomycete, grasses, saprophytic fungi

Introduction

Cortaderia selloana (pampas grass) is a perennial tussock-forming grass species native to Argentina, Brazil, Chile, Paraguay, and Uruguay (Astegiano et al. 1995). Its huge tussocks are very conspicuous and become attractive when they flower to produce showy feathery inflorescences. Pampas has been introduced in many regions of the world as a garden plant, dryland forage, soil amendment, and windbreaks. In some of these regions, it has become invasive (Pausas et al. 2006). The grass has become a particularly serious weed in New Zealand, where the feasibility of subjecting it to biological control is being explored (Bellgard et al. 2010).

Most records of fungal species associated with *C. selloana* are the result of studies performed in the countries where it has been introduced (Bellgard et al. 2010, Farr & Rossman 2012, McKenzie et al. 2007, Medd et al. 2003). Studies are now being conducted in Argentina to learn about the associated mycobiota present in its native distribution area.

During a survey of the fungi associated with *C. selloana* leaves in Buenos Aires province, a new species of *Scopinella* Lév. was discovered.

The genus *Scopinella* is characterized by ascomata with long necks and globose bodies, evanescent asci, and cuboid-ellipsoidal ascospores with two prominent longitudinal germ slits (Cannon & Hawksworth 1982, Stchigel et al. 2006). *Scopinella* is a small genus comprising seven species that grow on either fungi or plant substrates. It belongs to *Hypocreales*, where at present it cannot be assigned to any family (Lumbsch & Huhndorf 2010).

The shape of the ascospores of the specimen found on *C. selloana* distinguishes it from the other *Scopinella* species, so we describe it here as new.

Materials & methods

Partially senescent leaves of *Cortaderia selloana* were carefully inspected under a Wild M5A stereomicroscope. Sections bearing fruiting bodies were hand-made with a razor blade and mounted in either distilled water alone or with the addition of phloxine. Measurements were made in water. A Leica DM2000 dissecting microscope with a Leica EC3 camera was used to capture micromorphological images. For scanning electron microscopy intact ascomata were dehydrated in a 10–95% graded acetone series for fifteen minutes in each step, followed by three changes in absolute acetone. After critical point drying, the specimens were mounted on aluminum stubs, sputter coated with gold-palladium, and viewed with a LEO EVO 40 Scanning Electron Microscope (SEM). Recently collected leaves with the fungus were pressed and preserved in "Bahía Blanca Biología" Herbarium (BBB). The herbarium acronym follows Thiers (2012).

Scopinella pyramidospora R.M. Sánchez, L. Giord., F. Anderson & Bianchin., **sp. nov.** Plate 1

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Diagnosis: Differs from all other *Scopinella* species by its strongly asymmetrical, pyramidal ascospores.

Type: Argentina, Buenos Aires Province, Provincial Route No. 205, Km 308, (36°06′43″S 60°58′22″W): on senescent leaves of *Cortaderia selloana* (Schult. & Schult. f.) Asch. & Graebn. (*Poaceae*), 4.VII.2011, coll. FE Anderson (**holotype**, BBB [MVB 1501]).

Etymology: from the Greek πυραμίδος = pyramidal and σπόρος: spore.

Ascomata solitary to gregarious, superficial, settled on a dense mass of brown hyphae, globose to subglobose, with long necks, brown to black when dry, brown to paler brown at base when mounted in water, 106–150 µm high, 106–225 µm wide, peridial cells forming textura intricata. Necks cylindrical, 206–313 µm long, 31–75 µm wide at base, ostiolum 19–38 µm wide, cells of neck disposed in textura porrecta. Paraphyses moniliform, ramified, septate, hyaline, 4–7 µm wide. Asci 8-spored, unitunicate, clavate to globose, short-stipitate, evanescent, 13–28 × 10–16 µm. Ascospores 1-celled, strongly asymmetrical, resembling a truncated pyramid with quadrangular, somewhat convex, base, rounded vertices, smooth-walled at optical level, verruculose under SEM (>7,000×) with a dark brown median band, paler at ends, germ slits occasionally present, 7.5–9.5 × 5.5–8.5 µm (x = 8.4 × 6.7, n = 60). Anamorph not known.

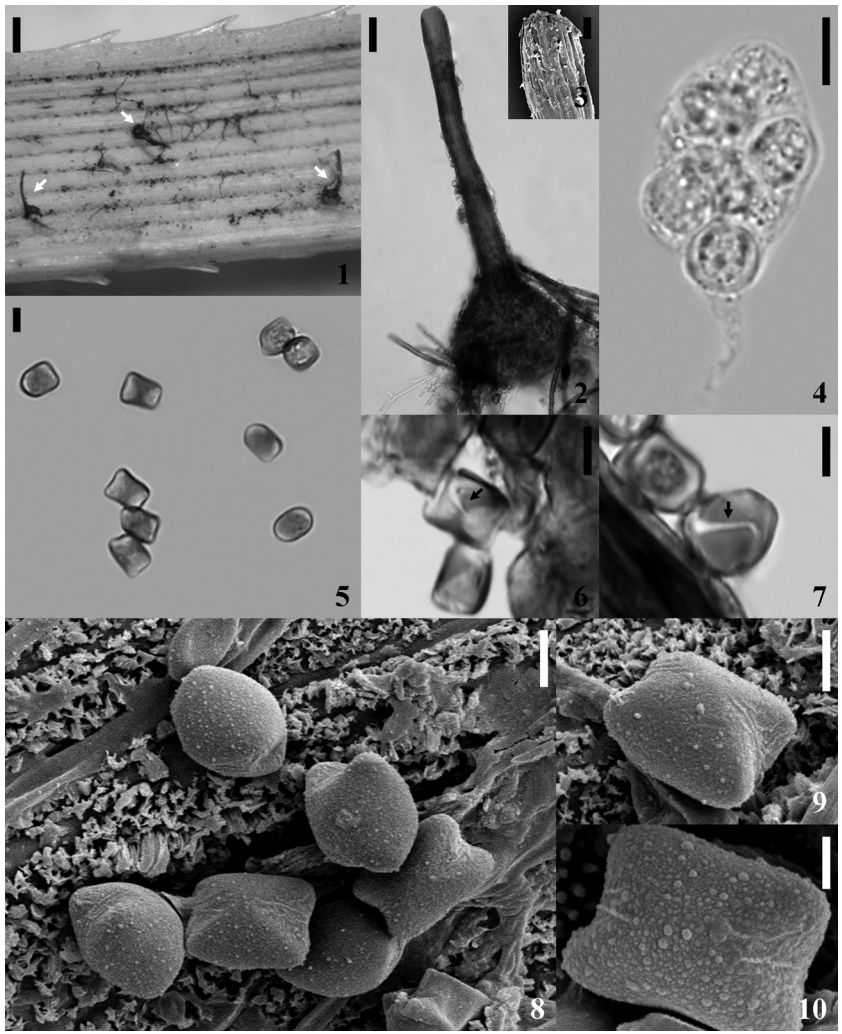

Plate 1: *Scopinella pyramidospora*: **1.** Ascomata on the substrate (arrows). **2.** Close-up of an ascoma. **3.** Apex of the ascomata neck (SEM, 4500×). **4.** Eight-spored ascus. **5**. Asymmetrical ascospores in various views. **6–7.** Ascospore germ slits (arrows). **8.** Ascospores (SEM, 7000×). **9.** Lateral view of a pyramidal ascospore (SEM, 10000×). **10**. Detail of ascospore wall (SEM, 20000×). Bars: 1 = 200 µm; 2 = 50 µm; 3 = 10 µm; 4, 6–7 = 5 µm; 5 = 7 µm; 8 = 4 µm; 9 = 3 µm; 10 = 2 µm.

Distribution— Argentina, known only from the type collection.

Comments— *Scopinella pyramidospora* differs from all other species of the genus in having strongly asymmetrical, pyramidal ascospores. Ascospore

asymmetry is best visualized by moving the microslide in three dimensions when mounted in water. Germ slits were seen only once under optical microscopy. This suggests that they are not as conspicuous and/or common as in the other species of the genus. Although the spore size falls in the range of *S. caulincola* (Fuckel) Malloch, ascospores of the latter are strongly flattened bilaterally and almost rectangular in surface view (as shown in von Arx & Müller 1954). The ascomata of *S. caulincola* have much longer necks, up to 2 mm long, with subhyaline short bristles at the apex (fide von Arx & Müller 1954). Ascomatal necks of *S. pyramidospora* are glabrous.

Discussion

Scopinella was erected by Léveillé (1847) to accommodate the single species *S. barbata* (Pers.) Lév. Saccardo (1891) added a second species, *S. pleiospora* (J. Schröt.) Sacc., originally described as *Melanospora pleiospora*. The genus was then ignored for almost a century until Hawksworth (1975) reestablished it by recognizing the synonymy between *S. barbata* and *Chaetoceratostoma hispidum* Turconi & Maffei. Hawksworth (1975) considered *Scopinella* to be monospecific and did not include Saccardo's *S. pleiospora*. Malloch (1976a,b) added three species to the genus (*S. caulincola*, *S. solani, S. sphaerophila*) and provided a key to differentiate these additions and the original *S. barbata*. Two more species were added, *S. gallicola* by Tsuneda & Hiratsuka (1981) and *S. musciformis* by Stchigel et al. (2006). No reference was made to *Scopinella pleiospora* in any of these studies. We failed to access type or authenticated material and presume the type material of *S. pleiospora* has been lost.

Scopinella species fall into two ecological groups. One comprises species growing on other fungi (*S. gallicola* and *S. sphaerophila*), and the other saprobic species, usually growing on plant substrates (*S. barbata, S. caulincola, S. musciformis*, *S. pyramidospora*, and *S. solani*). *Scopinella pleiospora* was described growing on rabbit dung. *Scopinella pyramidospora* and *S. solani* are the only two species of the genus known to occur on grasses. *Scopinella solani* was found growing on dead leaves of *Poa nevadensis* in North America (Malloch 1976a) and on overwintered inflorescences of *Brachypodium pinnatum, Dactylis glomerata*, and *Elytrigia repens* in Slovakia (Pastirčák & Pastirčáková 2007). *Scopinella solani* differs from *S. pyramidospora* in having longer ascomatal necks (300–500 µm), narrower asci (7–11.5 µm), and symmetrical and smaller ascospores (4.5–6.5 × 3.8–5.8 µm).

Scopinella species are difficult to cultivate, and the species from *Cortaderia selloana* was no exception. All attempts to isolate it on artificial media failed. Because of this, and the fact that the available material is at present very scarce, it was decided against performing any molecular work. To our knowledge the only species that have been cultivated are *S. gallicola* (Tsuneda & Hiratsuka

1981) and *S. solani* (Zhang & Blackwell 2002). Tsuneda & Hiratsuka (1982) found that for *S. gallicola* both growth and fructification were stimulated in dual culture with other fungi.

Phylogenetic studies have been performed on *S. solani*, the only species that has been sequenced. Zhang & Blackwell (2002) set *S. solani* in a distinct clade in *Hypocreales* apart from *Melanospora* in contrast with what was previously accepted (Hawksworth 1975).

Scopinella was reported in Argentina and South America for the first time with the finding of *S. solani* on bark of *Geoffroea decorticans* (Bianchinotti 1998). This is the second record of the genus from this region.

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