

## TWO NEW RECORDS OF THE FAMILY LOBARIACEAE (LICHENIZED ASCOMYCOTA: PELTIGERALES) FROM ARGENTINA

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**Summary:** As part of long term studies focused in the lichenized mycobiota diversity from southern Argentina, two species of the family Lobariaceae (Peltigerales), *Pseudocyphellaria pluvialis* and *Sticta longipes*, are registered for the first time in Argentina. These species were previously reported as endemic from southern Chile. Brief descriptions, illustrations and information about the distribution and ecology of the species are provided.

**Key words:** Distribution, diversity, *Pseudocyphellaria*, *Sticta*, South America.

**Resumen:** Dos nuevos registros de la familia Lobariaceae (Ascomycota liquenizados: Peltigerales) para la Argentina. Como parte de estudios a largo plazo enfocados en la diversidad de hongos liquenizados del sur de Argentina, se registran por primera vez para el país dos especies de la familia Lobariaceae (Peltigerales), *Pseudocyphellaria pluvialis* y *Sticta longipes*. Estas especies fueron citadas previamente como endémicas del sur de Chile. Se presentan descripciones breves, ilustraciones e información sobre la distribución y ecología de las especies.

**Palabras clave:** Distribución, diversidad, *Pseudocyphellaria*, *Sticta*, América del Sur.

### INTRODUCTION

Lichenized fungi are a conspicuous and relevant element of Andean-Patagonian forest in southern South America, both in terms of diversity, epiphytic biomass and nutrient cycling (Galloway, 1996). Among this, Lobariaceae Chevall. (Peltigerales) are a remarkable example. This Ascomycota family, with 13 genera and more than 500 species worldwide (Kirk *et al.*, 2008; Moncada *et al.*, 2013), is well known due to their often prominent thalli. Traditionally, the species included within this family are characterized by a foliose thallus, with a tomentose lower surface (and sometimes also upper surface), with pseudocyphellae or cyphellae on lower surface [*Pseudocyphellaria* Vain. and *Sticta* (Schreb.) Ach. respectively] or without them

[*Lobaria* (Schreb.) Hoffm. *s. lat.*], and with a diverse complex of secondary metabolites (Galloway, 1992; Moncada *et al.*, 2013). *Pseudocyphellaria* and *Sticta* are the two largest genera of this family. There are about 170 species of *Pseudocyphellaria*, distributed mainly in temperate regions in the Southern Hemisphere, with *ca.* 53 species reported for southern South America (Galloway, 1992). *Sticta* is a subcosmopolitan genus which includes *ca.* 114 species present in both hemispheres, but studies by Moncada (2012) and Moncada *et al.* (2013) mentioned that the genus has a centre of diversity in tropical South America and the number of species could increase up to 500. In Argentina and Chile, 12 species of *Sticta* have been cited (Galloway *et al.*, 1995).

Although both genera have been monographed for southern South America and intensively surveyed by different authors (Galloway, 1986; Galloway & Pickering, 1990; Galloway, 1992, 1994, Galloway *et al.*, 1995; Bjerke *et al.*, 2003; Bjerke & Elvebakk, 2004; Caldiz, 2005), there

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are still many aspects that remain unresolved. Moreover, in Argentina, where these taxa have been less intensely collected, and therefore their diversity and intraspecific variability are underestimated. The aim of the present work was to identify specimens of the genera *Pseudocyphellaria* and *Sticta* collected in Patagonia, in order to register new records of the family Lobariaceae for Argentina.

## MATERIALS AND METHODS

The present study was based on specimens of the genera *Pseudocyphellaria* and *Sticta* collected by the authors during 2014 and 2015 in different areas of the Nahuel Huapi National Park (north-western Patagonia, Argentina), which are housed at BCRU herbarium. A few additional collections were also revised from Dr. S. Calvelo personal herbarium (Hb. Calvelo). Specimens were studied using standard techniques for lichenology (Nash III *et al.*, 2002). Secondary metabolites were identified using spot test and thin-layer high performance chromatography (HPTLC) as described in Arup *et al.* (1993) and Orange *et al.* (2001).

## RESULTS AND DISCUSSION

The Nahuel Huapi National Park is particularly interesting as includes almost all of the Patagonian vegetation units, with exception of the Magellanic forest. Thus, represent a potential source of new records in the family Lobariaceae, especially considering the high number of species considered as endemic to Chile (Galloway, 1996). In this sense, we report for the first time the presence of two species of the family Lobariaceae whose morphological and chemical characteristics fit well with *Pseudocyphellaria pluvialis* and *Sticta longipes*.

***Pseudocyphellaria pluvialis*** R. Sant., in Galloway, *Lichenologist* 18(2): 150. 1986. Fig. 1 A-C.

Type: Chile. Prov. Valdivia; Lago Riñihue, Enco, *corticicola in silva mixta humida*, 12-X-1940, Santesson 3872 (*Holotypus* S!, *Isotypus* B, BM, C, FH, G, H, LD, LIL, MSC, O, R, S, UPS, US, W).

Synonym: *Pseudocyphellaria nitida* var. *mollis* Räsänen, *Revta. Univ. (Santiago)* 22: 205. 1937.

Thallus rosette-forming to irregularly spreading. Lobes slightly convex, irregularly laciniate, subdicotomously branched, imbricate to the centre. Margins entire, often thickened, sinuous, tomentose at lobes ends, tomentum conspicuous. Upper surface whitish to bluish grey, centrally glabrous, smooth to uneven. Soredia, isidia and phyllidia absent. Medulla white. Lower surface yellowish brown to dark brown centrally, tomentose. *Pseudocyphellariae* yellow, scattered, round to irregular. Photobiont cyanobacterial (*Nostoc*). Apothecia not seen. Pycnidia frequent.

*Chemistry*: Calycin, pulvinic acid and unidentified triterpenoids.

*Distribution*: Known for Chile from the VIII Región del Bío-Bío to the XI Región de Aisén (Galloway, 1986, 1992; Quilhot *et al.*, 2010, 2012). It is here cited for the first time to Argentina, from Provincia de Neuquén and Provincia de Río Negro (Fig. 1 G).

*Specimens examined*: ARGENTINA. *Prov. Neuquén*: San Martín de los Andes, río Chachin, XI-1992, Calvelo SC 830 (Hb. Calvelo). *Prov. Río Negro*: Puerto Blest, S 41° 01' 35.2'' W 71° 49' 13.5'', picada Los Cántaros, 27-III-2014, sobre roca, Messuti *et al.* (BCRU 05424).

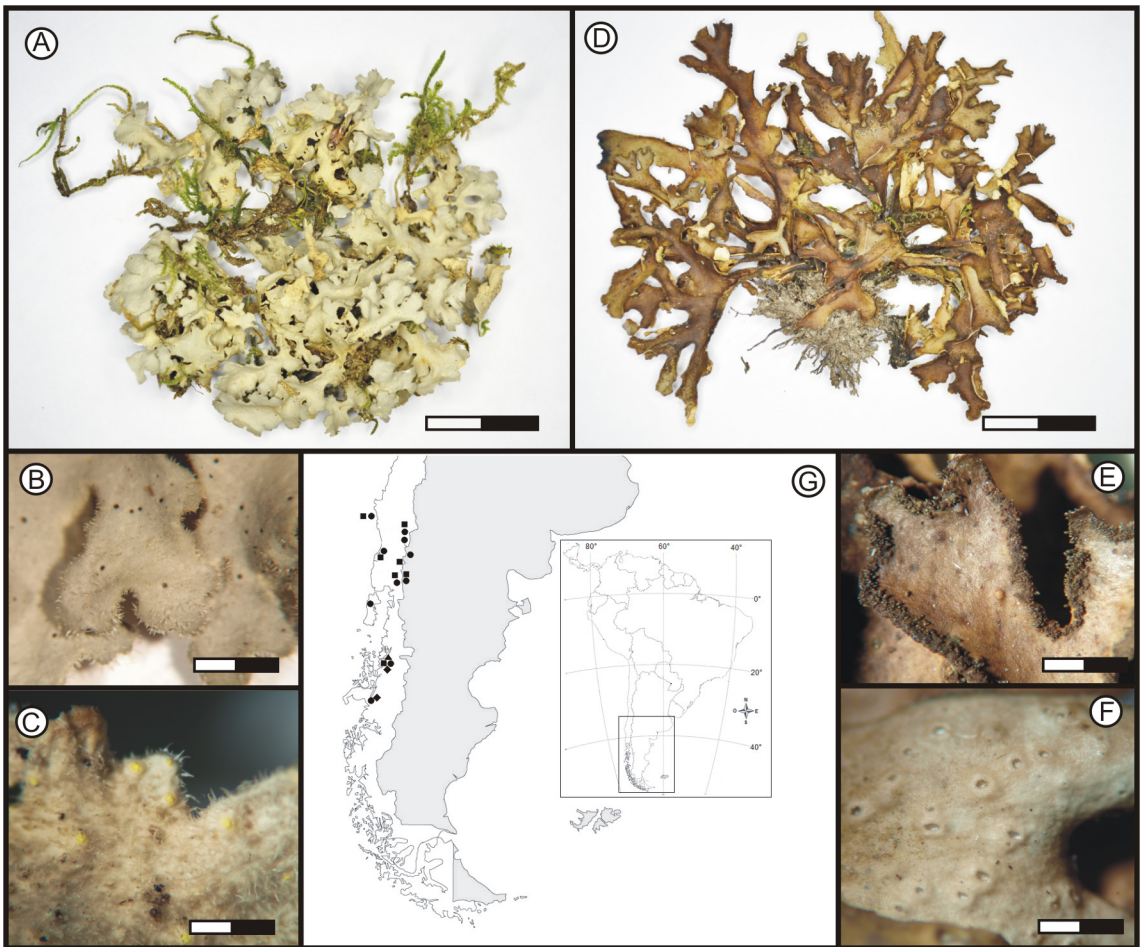
***Sticta longipes*** (Müll. Arg.) Malme, *Bih. K. svenska Vetensk Akad. Handl., Afd. 3* 25(no. 6): 11. 1899. Fig. 1 D-F.

Basionym: *Stictina longipes* Müll. Arg., *Flora, Regensburg* 65 (19): 303. 1882. Type: Chile. Valdivia (*ex* Hb. Hampe 1877) (*Holotypus* G001993, *n.v.*)

Synonym: *Stictina filicinella* var. *pallescens* Räsänen, *Revta. Univ. (Santiago)* 22: 303. 1937.

*Stictina filicinella* var. *roseola* Räsänen, *Revta. Univ. (Santiago)* 22: 303. 1937.

Thallus ± erect and spreading, firmly attached to substratum by a holdfast, with a short conspicuous stalk. Lobes elongated to laciniate, ± radiating and subdicotomously branched to irregularly spreading and overlapping. Margins entire, commonly eroded and isidiated. Soredia and phyllidia absent. Upper surface smooth, matt, minutely isidiate. Isidia small, granular to erect and terete, concolorous with thallus, often congested. Medulla white. Photobiont cyanobacterial (*Nostoc*). Lower surface pale to yellow-buff centrally, mainly glabrous to patchily-



**Fig. 1.** Morphology and distribution of the species. A-C, *Pseudocyphellaria pluvialis* (BCRU 05424). A, habit. B, detail of the upper surface with tomental hairs. C, detail of lower surface with sparse pseudocyphellae. D-F, *Sticta longipes* (BCRU 05429). D, habit. E, detail of margins with isidia. F, detail of thelotremoid cyphellae. G, known geographic distribution in Argentina and Chile of *P. pluvialis* (●) and *S. longipes* (■). Scales = 2.5 cm in A; 2 cm in D; 4 mm in B & C; 3 mm in E & F.

velvety. Cyphellae scattered, thelotremoid, small. Apothecia rare, marginal or laminal. Pycnidia sparse, swollen, papillate.

*Chemistry:* No secondary metabolites.

*Distribution:* *Sticta longipes* is distributed from IX Región de la Araucanía to XI Región de Aisén, Chile (Galloway, 1994; Quillhot *et al.*, 2010, 2012); and in Argentina, the species has only been registered for Provincia de Río Negro (Fig. 1 G).

*Specimens examined:* ARGENTINA. *Prov. Río Negro:* Puerto Blest, picada Los Cántaros, S 41° 01' 03.9'' W 71° 49' 29.2'', 25-IX-2015, sobre roca, Passo & Messuti (BCRU 05429).

#### *Notes on habitat and ecology*

*Pseudocyphellaria pluvialis* and *S. longipes* were previously reported as endemic to southern Chile (Galloway, 1986, 1994; Quillhot *et al.*, 2010, 2012). These foliose lichens are common elements of the Valdivian rainforest, growing in the shaded and humid areas of the evergreen *Nothofagus* forest either epiphytic, terricolous and/or muscicolous. In Argentina, they were found in similar habitats, on rocks covered with mosses, in the restricted ingressions of the Valdivian rainforest (such as Puerto Blest), east of the Andes (Fig. 1 G).

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