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Erratum

Carlos Lado, Diana Wrigley de Basanta, Arturo Estrada-Torres & Eva García-Carvajal (2014). Myxomycete diversity of the Patagonian Steppe and bordering áreas in Argentina / Diversidad de Myxomycetes en la estepa patagónica y zonas limítrofes en Argentina. Anales del Jardín Botánico de Madrid 71(1): 3006 2014. DOI 10.3989/ajbm.2394.

The original publication contains the following errors:

Caption for figure 10:

Where it says **I-J.** it should say **I-L**.

Where it says **K.** it should say **I.**

Where it says **L.** it should say **J.**

Where it says **M.** it should say **K.**

Where it says **N.** it should say **L.**

In page 21

Change **MA-Fungi 6744** by **MA-Fungi 86744**

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Myxomycete diversity of the Patagonian Steppe and bordering areas in Argentina

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Abstract

Lado, C., Wrigley de Basanta, D., Estrada-Torres, A. & García-Carvajal, E. 2014. Myxomycete diversity of the Patagonian Steppe and bordering areas in Argentina. *Anales Jard. Bot. Madrid* 71(1): e006.

Biodiversity surveys for myxomycetes (Amoebozoa) were carried out in three consecutive years (2009 to 2011) in the cold arid Patagonian Steppe, Argentina. The surveys, the first to cover such an extensive area in South America, form part of the Myxotropic project funded by the Spanish Government. Specimens were collected in 174 localities in four different provinces (Neuquén, Río Negro, Chubut and Santa Cruz), between 36° and 52° S latitudes. The most common types of substrate investigated were the dominant shrubs and grasses of the Patagonian steppe, and the *Nothofagus* forests, characteristic of the transition areas, but other plants such as small cacti and cushion plants were also included in the survey. A total of 133 different species and 5 varieties of myxomycetes representing 31 genera were identified in the 1134 specimens collected either in the field, or from moist chamber cultures prepared with samples of plant material obtained from the same collecting sites. The results include one species new to science, *Perichaena nigra*, and 17 species and two varieties that were previously unknown for either the Neotropics or South America, *Badhamia armillata, Dianema mongolicum, Didymium annulisporum, D. leptotrychum, D. orthonemata, D. sturgisii, Echinostelium coelocephalum, Licea deplanata, L. nannengae, Macbrideola argentea, M. oblonga, Oligonema aurantium, Perichaena luteola, P. madagascariensis, Physarum luteolum, Protophysarum phloiogenum, Trichia contorta var. attenuata, T. contorta var. iowensis, T. erecta.* An additional 19 species are new records for Argentina. These additions make Argentina the country in South America, at present, with the greatest number of myxomycetes catalogued having more than 50% of the species cited from the whole Neotropics. Diversity and biogeographic distribution of these organisms are discussed, and taxonomic comments on rare or unusual species are included and illustrated with photographs by LM and SEM. The results indicate that the myxomycetes, are widely distributed and are a normal component of Patagonian biota. Many of the substrates investigated were endemic plants from the region and are new substrates for a number of species of myxomycete. Differences between the variety of species in this area and others in Argentina and Chile, suggest a certain regional specialization of these organisms, the assemblage of which appear to depend on plant substrate species.

Keywords: Amoebozoa, biodiversity, cold desert, endemic plants, steppe vegetation, plasmodial slime moulds, arid lands.

Resumen

Lado, C., Wrigley de Basanta, D., Estrada-Torres, A. & García-Carvajal, E. 2014. Diversidad de Myxomycetes en la estepa patagónica y zonas limítrofes en Argentina. *Anales Jard. Bot. Madrid* 71(1): e006.

Durante tres años consecutivos (2009-2011), se ha realizado un estudio de las zonas áridas frías de la estepa patagónica con el objetivo de conocer su diversidad de Myxomycetes (Amoebozoa). Este estudio es el primero que cubre una extensa área de Sudamérica y forma parte del proyecto Myxotropic financiado por el gobierno español. Se recolectaron especímenes en 174 localidades de cuatro diferentes provincias (Neuquén, Río Negro, Chubut y Santa Cruz), entre los 36° y los 52° de latitud sur. Los principales sustratos que se estudiaron fueron los arbustos y pastos dominantes de la estepa patagónica, pero también se incluyeron los procedentes de los bosques de *Nothofagus*, característicos de las áreas de transición, y de otras plantas como pequeñas cactáceas y plantas almohadilladas. En total se han identificado 133 especies y 5 variedades de Myxomycetes, pertenecientes a 31 géneros, que corresponden con 1134 especímenes. Dichos especímenes procedían directamente del campo u obtenidos a partir de cultivos en cámara húmeda, las cámaras se prepararon con restos de plantas que se recolectaron en los mismos sitios de muestreo. Los resultados incluyen una nueva especie para la ciencia, *Perichaena nigra*, y 17 especies y dos variedades que no se conocían previamente para el Neotrópico o para Sudamérica: *Badhamia armillata, Dianema mongolicum, Didymium annulisporum, D. leptotrychum, D. orthonemata, D. sturgisii, Echinostelium coelocephalum, Licea deplanata, L. nannengae, Macbrideola argéntea, M. oblonga, Oligonema aurantium, Perichaena luteola, P. madagascariensis, Physarum luteolum, Protophysarum phoiogenum, Trichia contorta* var. *attenuata, T. contorta* var. *iowensis* y *T. erecta.* Con estos datos, que suponen más del 50% de las especies catalogadas del Neotrópico, Argentina se convierte en el país sudamericano con mayor número de especies registradas. Se discute la diversidad y distribución geográfica de estos organismos y se incluyen comentarios taxonómicos, así como fotografías, realizadas con microscopía óptica y microscopía electrónica de barrido, de especies raras o poco conocidas. Los resultados indican que los Myxomycetes están ampliamente distribuidos en Patagonia y son un componente normal de la biota de esta región. Muchos de los sustratos que se investigaron correspondían a restos de plantas endémicas de la región y constituyen nuevos sustratos para diversas especies de Myxomycetes. Las diferencias encontradas entre las especies de la zona estudiada en relación a otras de Argentina y Chile, previamente investigadas, sugieren cierto grado de especialización regional y la composición de especies parece depender de los sustratos vegetales presentes en cada una.

Palabras clave: Amoebozoa, biodiversidad, desiertos fríos, plantas endémicas, vegetación de estepa, hongos mucilaginosos plasmodiales, zonas áridas.

INTRODUCTION

The Myxomycetes, also referred to as plasmodial slime moulds, or Mycetozoa using zoological nomenclature, are a group of eukaryotic microorganisms, with an important ecological role in all terrestrial ecosystems (Feest & Madelin, 1985; Foissner & Hawskworth, 2009). It now appears that their presence in arid and semi-arid environments is more widespread than previously imagined, to a large degree due to the funding of the study of the warm drylands of America

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such as the Atacama Desert (Lado & al., 2007, 2013), the Monte Desert (Lado & al., 2011) and Tehucán-Cuicatlán Valley in Mexico (Estrada-Torres & al., 2009). Many new species have been described (Lado & al., 1999, 2007, 2009, 2013; Estrada-Torres & al., 2001, 2009; Mosquera & al., 2003; Wrigley de Basanta & al., 2008, 2009, 2010a, 2011, 2012), highlighting the importance of myxomycetes in these extreme arid environments, in spite of their dependence on water to complete their life cycle.

But there is a paucity of information on the cold drylands, since only some areas of Central Asia have been studied in detail (Schnittler & Novozhilov, 2000; Schnittler, 2001; Schnittler & al., 2013; Novozhilov & al., 2006, 2008). The cold deserts of South America have never been systematically surveyed for myxomycete diversity. To address this lack of information, the Spanish Government, through the Myxotropic Project (www.myxotropic.org), has supported expeditions to Patagonia, for the purpose of obtaining a body of information on the diversity, distribution and ecology of the myxomycetes from these cold arid lands.

Patagonia is a vast territory of approximately 673,000 km^2 in extreme southeastern South America. Located primarily in southern Argentina with a small portion penetrating Chilean territory in the far South on both sides of the Straits of Magellan. The Argentinean territory is bounded by the Andes to the West, and the Atlantic Ocean to the East. The North is limited by the Monte desert and the Pampas lowlands, and to the South by the sub-Antarctic Tierra del Fuego archipelago (Fig. 1). The biogeographical interest of this region is due to the fact that the Patagonian Desert, or Patagonian Steppe, is considered to be a cold semi-desert or semi-arid land with extreme climatic conditions (Soriano, 1983). It is the 7th largest desert in the world, and the largest desert in Argentina. Patagonia has unique xerophytic vegetation with plants that serve as potential substrates for myxomycetes. It is dominated by semi-desert (45%), shrub-steppe (30%) and grass-steppe (20%) vegetation, with some 30% of endemic plants (Soriano 1983). The austral forests, dominated by several species of *Nothofagus*, are limited to a narrow band in the Andean Cordillera.

Knowledge of Patagonian myxomycete diversity was poor. Crespo & Lugo (2003) in their catalogue of Myxomycetes from Argentina reported only 9 species from Chubut, Neuquén and Río Negro provinces. However the number for these provinces and Santa Cruz was increased with the recent contribution of Wrigley de Basanta & al. (2010b) who reported 67 species from 23 genera, but these records were of specimens harvested in the subantarctic forests to the West and not the Steppe. The study included Tierra del Fuego, adding to the catalogue of cryptogamic flora from Tierra del Fuego (Arambarri, 1975), where species from this adjacent territory were reported. Several further species have been reported, from the Andes mountains, by Ronikier & Lado (2013) and Ronikier & al. (2013). In their biodiversity inventory of myxomycetes from the Monte desert, that marks the northern and northeastern limits of Patagonia, Lado & al. (2011) also report some data from transition zones.

STUDY AREA

The area considered in the survey described here, is of continental southern Argentina, between latitudes 36°S and 52°S and longitudes 63°W and 72°30′W (Fig. 1), covering the provinces of Neuquén, Río Negro, Chubut and Santa Cruz. From a geological point of view, Patagonia is made up of a Precambrian nucleus, the Patagonian massif, with deposits of volcanic rock (basalt), and terrestrial and marine deposits dating from the Early Permian to the Tertiary. The desert consists of a sequence of tablelands and hills sloping eastward to the sea from varied Andean piedmont elevations, around 2,000 m in the north to 700 m in the south, and interrupted by a few river valleys (Volkheimer, 1983; Davis & al., 1997). The western parts of the steppe, are in contact with the Andean Cordillera.

All Patagonia is constantly affected by the strong, prevailing west winds or Westerlies, the most obvious climatic feature of Patagonia. These west winds pick up moisture over the Pacific and then lose it over the Andes, in the form of heavy rain and snow. The eastern side of the mountains is in a rain shadow since the air masses descend and become warmer and very dry (Walter & Box, 1983). This means that to the East of the cordillera, the climate is one of severe dryness and low temperatures (annual mean 9°-5°C) and constant drying winds from the west (Davis & al., 1997). The Falkland Current, a cold current off the Atlantic coast, also contributes to the area's aridity. The whole region has around seven months of winter and five months of summer, without spring or autumn. During the summer, frost is still common everywhere, and even sleet and light snow can fall during the warm season, including the time of these surveys.

According to Morrone (2006), from a biogeographic point of view, Patagonia falls within the Andean region, sub region Patagonia. In this sub region there are two different provinces, Subandean Patagonia and Central Patagonia. The first forms a narrow belt skirting the southern Andes and most of the territory is between 1,200 and 2,500 m elevation, with a few higher peaks, such as the Lanín volcano (3,774 m), Mt. Tronador (3,554 m), Cerro San Valentín (4,058 m), Cerro Fitz Roy (3,375 m) (Fig. 2A) and others. Because of the latitude glaciers are frequent at relatively low altitudes (Fig. 2B). Precipitation is high, reaching 6,000 mm of annual precipitation at some points (Walter & Box, 1983), usually as snow, but the precipitation decreases dramatically only a few kilometres to the East. As Walter & Box (1983) illustrate, at points like Puerto Blest, 45 km West of Bariloche (Neuquén province), rainfall can still reach 4,000 mm per year, but at Bariloche it is only 1,080 mm and in Central Patagonia, about 70 km East of Bariloche, it is only 300 mm. In the Central province semi-desert steppe vegetation prevails (Figs. 2D-2F). The vegetation, in the wetter Subandean Patagonia, is predominantly austral forest of *Nothofagus* spp. (Figs. 2A-2C), some conifers such as *Fitzroya cupressoides* or *Austrocedrus chilensis,* and transition mixed scrub and forests.

The Central province is made up of plateaus and hills with elevations from 1,200-800 m, descending gradually towards the East to the Atlantic Ocean (Figs. 2E, 2G, 2N-2O). The mean temperature is relatively low (5°-7°C) and annual rainfall is only rarely as much as 400 mm. The vegetation is dominated by shrubs and tuft grasses, characteristic of steppe vegetation (Figs. 2F, 2H-2I). Plants are adapted to the low temperatures and the drying effect of the strong and constant winds that leave only a reduced layer of decayed organic matter. Sheep were introduced at the end of nineteenth century and covered the whole territory of Patagonia, causing important changes in vegetation cover. The present day plant cover is from 20-40%, with species of

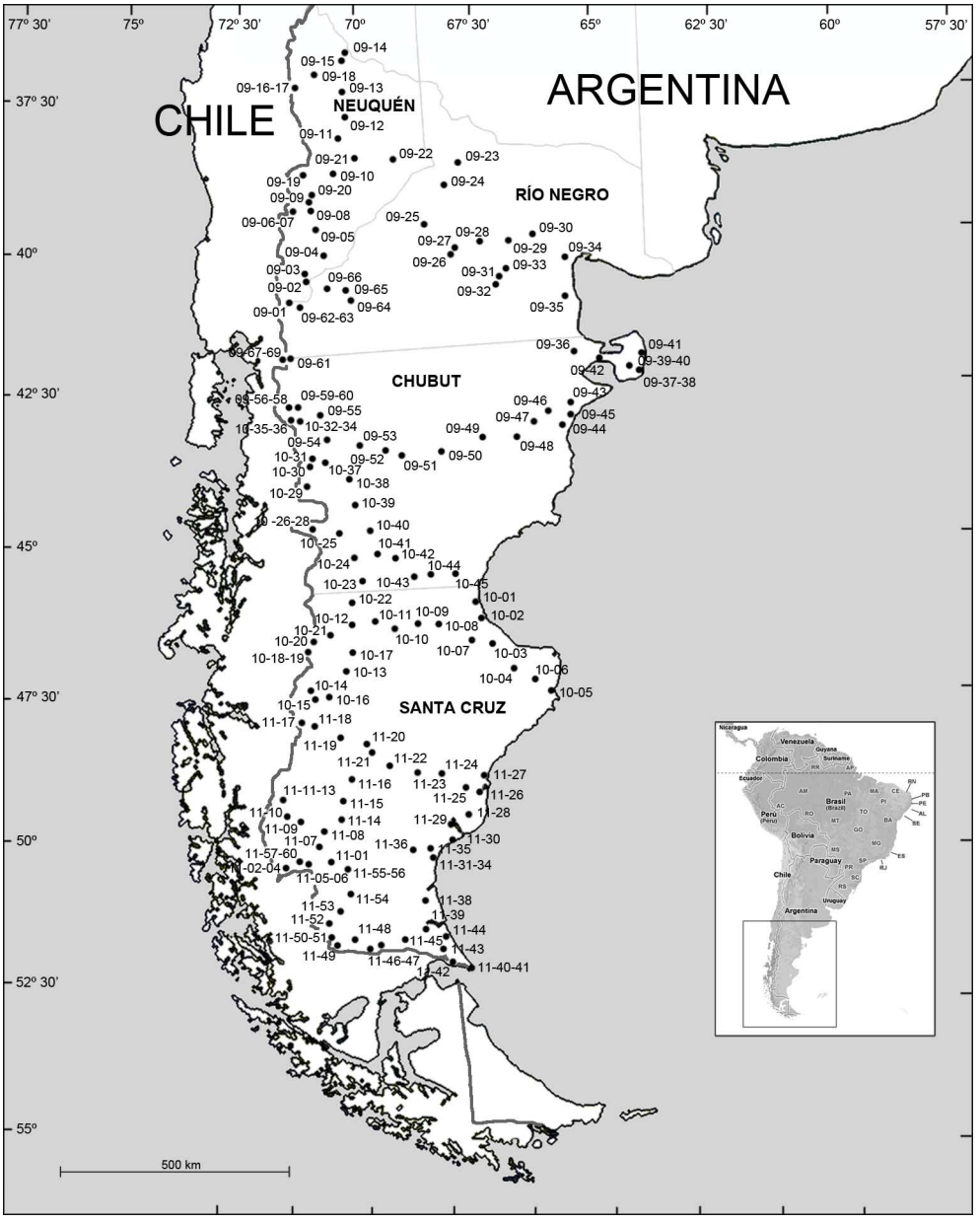

Fig. 1. Map of the general study area and localities sampled (for more information see Table 1).

the genus *Adesmia, Senecio* (Fig. 2J)*, Chuquiraga, Nassauvia, Mulinum* (Fig. 2J)*, Schinus* or *Festuca* (Figs. 2M-2N) dominating large areas of the territory. Some cushion-like plants such as *Azorella* spp. (Fig. 2K) and cacti like *Maihuenia, Maihueniopsis* or *Austrocactus* (Fig. 2L) are also present. The landscape of Patagonia could seem uniform and monotonous, but the gradual change of plants alters the scenery and gives rise to rich and different terrains. Patagonia may also seem one of the least likely places for the development of myxomycetes but even the sparse vegetation of the steppe provides microhabitats that the myxomycetes can exploit.

MATERIAL AND METHODS

The fieldwork was done over three consecutive years (2009-2011) in order to cover the largest area possible. Sampling, was done as a series of transects from the Cordillera to the Coast at parallels 39°-41°S, 42°-44°S, 45°-47°S, 48°-50°S and 51°-53°S, and two North-South transects, one along the cordillera and adjacent areas, and the other along the coast, starting at the mouth of the river, Río Negro and ending in Cape Virgenes, the southernmost point of continental Argentina. A total of 174 localities of the four provinces were sampled (Table 1). Special attention was paid to areas where native vegetation is well preserved. Argentina has a good network of National Parks (NP) and Nature Reserves (NR) in Andean Patagonia, but the Patagonian Steppe is less well represented. Thanks to the facilities provided by the Argentinean National Parks Administration, we sampled in Lanín NP, Nahuel Huapi NP, Lago Puelo NP, Los Alerces NP, Los Glaciares NP, Perito Moreno NP, Monte León NP and adjacent areas. Also some Nature Reserves such as Cape Vírgenes and Protected Natural Areas like Península Valdés or the Meseta de Somuncurá, a semi-arid basalt plateau,

Fig. 2. A. *Nothofagus* forest in Cerro Fitz Roy, Los Glaciares NP. **B.** *Nothofagus* forest near Perito Moreno glacier, Los Glaciares NP. **C.** *Nothofagus* forest with abundant dead wood, a feature of this kind of forest, Los Alerces NP. **D.** Transition area between the forest and the steppe, Los Glaciares NP. **E-F.** Vegetation of the steppe. **G.** Woody bushes in the steppe. **H.** Andean scrubland in El Calafate. **I.** Steppe vegetation in the Meseta de Somuncurá. **J.** Shrubs of *Mulinum* sp. and *Senecio* sp. **K.** Cushion plant (*Azorella* spp.). **L.** Cushion cacti (*Maihuenia* sp.). **M-N.** Tussock grasses. **O.** Steppe vegetation near the ocean, Monte León NP.

were sampled. The authors collected all the specimens, with the assistance in 2009 and 2010 of Dr. Ania Ronikier.

For the Geo-references in Table 1, a GPS model Garmin eTrex Vista HCX (datum WGS84) was used. All potential substrates for myxomycetes were examined in the field, and samples of plant litter or bark were removed and returned to the laboratory, in small paper bags, for preparation of moist chamber cultures for laboratory isolation of myxomycetes. The observation period for cultures was up to three months. A species recorded from one moist chamber culture was regarded as a single collection, irrespective of the number of sporophores appearing or the days separating their appearance. Details of the methods used can be found in Wrigley de Basanta & al. (2009). All numbers cited below refer to specimens deposited in the herbarium MA-Fungi (sub Lado or egc), or the private collection of Diana Wrigley de Basanta (dwb), with some duplicates in TLXM (sub aet). Microscopic measurements and observations were made with material mounted directly in Hoyer's medium or polyvinyl alcohol. A differential interference contrast (DIC) microscope was used to obtain descriptive data. The light photomicrographs were obtained using a Nikon AZ100 microscope, and subsequently treated with program Photoshop CS4 in order to create a composite digital photograph of sporophores from the in-focus areas of each image made. Some specimens were examined at 10-15 kV, with a Hitachi S-3000N scanning electron microscope (SEM), in the Real Jardín Botánico, CSIC. For all SEM-photographs the critical point dried material technique was employed. Colour notations in parenthesis are from the ISCC-NBS Color Name Charts Illustrated with Centroid Colors (Anonymous, 1976).

Data analysis Taxonomic diversity was calculated as the mean number of species per genus (S/G), as it has been used in other studies of myxomycetes (Stephenson & al., 1993). The completeness of the sampling effort was evaluated using the ACE and CHAO1 abundance indices

Table 1. Summary data on collecting localities in Patagonia.

ARG-09-01: Neuquén, Los Lagos, Dina Huapi, route RN-40, km 2059, intersection to La Angostura, 41°01'59.9''S 71°09'12.3''W, 815 m, steppe, 5-XI-2009.

ARG-09-02: Neuquén, Los Lagos, Dina Huapi, route RN-40, km 2090, North of La Lipela, 40°50'15.0''S 71°06'16.7''W, 733 m, transition steppe to *Austrocedrus chilensis* forest, 5-XI-2009.

ARG-09-03: Neuquén, Los Lagos, Dina Huapi, route RN-40, km 2101, South of Confluencia, 40°45'06.9''S 71°06'55.5''W, 720 m, *Austrocedrus chilensis* forest, 5-XI-2009.

ARG-09-04: Neuquén, Los Lagos, Lacar, route RN-40, km 2165, South of Puente Collón Curá, 40°28'17.2''S 70°39'29.2''W, 635 m, steppe, 5-XI-2009.

ARG-09-05: Neuquén, Huiliches, Junín de los Andes, route RN-40, km 2226, Southwest of La Rinconada, 40°01'02.3''S 70°49'24.2''W, 668 m, steppe, 5-XI-2009.

ARG-09-06: Neuquén, Huiliches, Malleo, Paso Tromen or Mamuil Malal, Lanín NP, route 60, West of the National Guard post, 39°36'10.0''S 71°22'22.2''W, 998 m, *Araucaria araucana* forest, 6-XI-2009.

ARG-09-07: Neuquén, Huiliches, Malleo, Paso Tromen or Mamuil Malal, Lanín NP, route 60, río Malleo, East of the National Guard post, 39°36'46.6''S 71°21'01.5''W, 976 m, *Araucaria araucana* forest, 6-XI-2009.

ARG-09-08: Neuquén, Huiliches, Malleo, route 23, 10 km South of Puente Pilolil on Aluminé river, 39°39'28.9''S 70°57'42.3''W, 843 m, steppe, 6-XI-2009.

ARG-09-09: Neuquén, Aluminé, Aluminé, Rahué, Rincón la Media Luna, route 23,14 km North of Pilolil, on Aluminé river, 39°3120.4''S 70°58'24.3''W, 830 m, mixed *Nothofgus* sp. and *Austrocedrus chilensis* forest, 6-XI-2009.

ARG-09-10: Neuquén, Zapala, Zapala, Ñireco, route 46, 7 km Southwest of Laguna Blanca NP, 39°05'55.2''S 70°23'19.9''W, 1366 m, steppe, 6-XI-2009.

ARG-09-11: Neuquén, Picunches, Las Lajas, route RN-40, km 2473, 20 km East of Las Lajas, 38°30'06.6''S 70°12'24.7''W, 764 m, xerophyllous scrubland with *Larrea* sp., 7-XI-2009.

ARG-09-12: Neuquén, Loncopue, Las Lajas, route RN-40, km 2518, 65 km North of Las Lajas, 38°09'23.0''S 70°06'09.1''W, 792 m, steppe, 7-XI-2009.

ARG-09-13: Neuquén, Loncopue, Chos Malal, route RN-40, km 2574, Paraje Pichi Neuquén, 8 km South of Naunauco, 37°42'14.8''S 70°09'07.3''W, 942 m, xerophyllous scrubland with *Larrea* sp., 7-XI-2009.

ARG-09-14: Neuquén, Chos Malal, Chos Malal, Reserva Provincial Tromen, refugio Cerro Waile, 37°04'44.9''S 70°07'09.3''W, 2243 m, Andean scrub in transition to steppe, 4, 7-XI-2009.

ARG-09-15: Neuquén, Chos Malal, Chos Malal, Tromen RP, laguna Los Barros, 37°06'59.7''S 70°08'22.2''W, 2004 m, Andean scrub in transition to steppe, 7-XI-2009.

ARG-09-16: Neuquén, , Andacoyo, Moncol, Puerto Pichachén, route 57, 17 km Southwest of the National Guard post, 37°26'51.3''S 71°05'57.4''W, 1930 m, Andean scrub, 8-XI-2009.

ARG-09-17: Neuquén, Ñorquín, Andacoyo, Moncol, Puerto Pichachén, route 57, 16 km Southwest of the National Guard post, 37°26'49.9''S 71°06'18.5''W, 1880 m, Andean scrub, 8-XI-2009.

ARG-09-18: Neuquén, Ñorquín, Andacoyo, Guañaco, route 57, 2 km North of the intersection to El Cholar, 37°19'48.8''S 70°44'21.0''W, 1100 m, Andean scrub, 8-XI-2009.

ARG-09-19: Neuquén, Aluminé, Aluminé, lake Aluminé, Lonco Luan, route 23, 6 km North of Puente Rebolledo, 38°59'37.8''S 71°01'56.8''W, 1142 m, *Araucaria araucana* forest, 9-XI-2009.

ARG-09-20: Neuquén, Aluminé, Aluminé, Rahué, route 46, 8 km East of Rahué, 39°22'33.1''S 70°53'52.8''W, 924 m, gallery forest with *Salix* sp. and *Populus* sp., 9-XI-2009.

ARG-09-21: Neuquén, Zapala, Zapala, route RN-22, km 1389,10 km West of Santo Domingo, 38°53'05.5''S 69°54'31.2''W, 880 m, steppe, 10-XI-2009.

ARG-09-22: Neuquén, Confluencia, Cutral-Có, Plaza Huincul, route RN-22, km 1308, 11 km East of Plaza Huincul, 38°58'09.9''S 69°01'37.0''W, 419 m, xerophyllous scrubland with *Larrea* sp., 10-XI-2009.

ARG-09-23: Río Negro, El Cuy, Paso Córdoba, route 6, 2 km West of Paso Córdoba, 39°07'20.7''S 67°38'24.6''W, 256 m, steppe, 10-XI-2009.

ARG-09-24: Río Negro, El Cuy, El Cuy, route 6, 8 km North of the intersection to route 71 and 54 km South of Paso Córdoba, 39°29'35.3''S 67°56'49.8''W, 446 m, steppe, 10-XI-2009.

ARG-09-25: Río Negro, 25 de Mayo, El Cuy, route 6, 3 km North of San Antonio del Cuy and 27 South of El Cuy, 40°08'01.0''S 68°26'09.1''W, 904 m, steppe, 10-XI-2009.

ARG-09-26: Río Negro, 9 de Julio, Sierra Colorada, route RN-23, km 236, 13 km South of Sierra Colorada, 40°39'14.4''S 67°50'47.9''W, 700 m, steppe, 11-XI-2009.

ARG-09-27: Río Negro, 9 de Julio, Sierra Colorada, route 67 La Esperanza, 4 km West of Sierra Colorada, 40°35'03.5''S 67°48'42.1''W, 708 m, steppe, 11-XI-2009.

ARG-09-28: Río Negro, 9 de Julio, Ministro Ramos Mexía, route RN-23, km 179, 40°29'19.5''S 67°14'18.0''W, 412 m, steppe, 11-XI-2009.

ARG-09-29: Río Negro, Valcheta, Valcheta, Nahuel Niyeu, route RN-23, km 116, 40°30'20.4''S 66°32'28.3''W, 170 m, steppe, 11-XI-2009.

ARG-09-30: Río Negro, Valcheta, Valcheta, Indio Muerto Lagoon, route 4, 31 km North of Valcheta, 40°25'32.6''S 66°03'06.4''W, 88 m, steppe, 11-XI-2009.

ARG-09-31: Río Negro, Valcheta, Valcheta, Chipauquil, Meseta de Somuncura plateau, route 60, 26 km South of Chipauquil, 41°05'57.2''S 66°48'64.7''W, 857 m, steppe, 12-XI-2009.

Table 1. (*Continuation*)

ARG-09-32: Río Negro, 9 de Julio, Valcheta, Chipauquil, Meseta de Somuncurá, route 60, 44 km South of Chipauquil, 41°12’33.8’’S 66°53’29.4’’W, 1053 m, steppe, 12-XI-2009.

ARG-09-33: Río Negro, Valcheta, Valcheta, Chipauquil, Meseta de Somuncurá, route 60, 4 km South of Chipauquil, 40°58’10.0’’S 66°39’38.8’’W, 588 m, steppe, 12-XI-2009.

ARG-09-34: Río Negro, San Antonio, San Antonio Oeste, route RN-23, km 1, intersection to route RN-3, 40°49’11.5’’S 65°21’07.5’’W, 160 m, steppe, 13-XI-2009.

ARG-09-35: Río Negro, San Antonio, Sierra Grande, route RN-3, km 1244, 18 km North of Sierra Grande, 41°26’25.7’’S 65°21’30.3’’W, 163 m, steppe, 13-XI-2009.

ARG-09-36: Chubut, Biedma, Puerto Madryn, route RN-3, km 1355, 30 km North of the intersection to route 2 to Puerto Pirámides, 42°21’22.3’’S 65°11’23.2’’W, 95 m, steppe, 13-XI-2009.

ARG-09-37: Chubut, Biedma, Península Valdés, Puerto Pirámides, route 2, 43 km East of Puerto Pirámides and 6 km West of Salina Chica, 42°40’37.4’’S 63°56’20.6’’W, 78 m, steppe, 14-XI-2009.

ARG-09-38: Chubut, Biedma, Península Valdés, Puerto Pirámides, route 2, Salina Chica, 51 km East of Puerto Pirámides and 22 km West of Punta Delgada, 42°39’13.1’’S 63°51’52.0’’W, -16 m, steppe, 14-XI-2009.

ARG-09-39: Chubut, Biedma, Península Valdés, Puerto Pirámides, Punta Delgada, 70 km East of Puerto Pirámides, 42°45’55.4’’S 63°38’21.5’’W, 31 m, steppe, 14-XI-2009.

ARG-09-40: Chubut, Biedma, Península Valdés, Puerto Pirámides, Punta Delgada, 9 km North of Punta Delgada on route 47 to Caleta Valdés and Punta Cantor, 42°43’06.3’’S 63°38’23.7’’W, 32 m, steppe, 14-XI-2009.

ARG-09-41: Chubut, Biedma, Península Valdés, Puerto Pirámides, route 47, Caleta Valdés, 11 km North of Estancia Elvira, 42°25’38.3’’S 63°38’01.8’’W, 1 m, steppe, 14-XI-2009.

ARG-09-42: Chubut, Biedma, Península Valdés, Itsmo Carlos Ameghino, a 6 km South of Riacho San José and1 km North of the intersection to route 2 to Puerto Pirámides, 42°27’47.5’’S 64°38’52.6’ W, 84 m, steppe, 15-XI-2009.

ARG-09-43: Chubut, Rawson, Trelew, route RN-3,15 km North of Trelew, 43°10’13.3’’S 65°17’17.7’’W, 34 m, steppe, 15-XI-2009.

ARG-09-44: Chubut, Gaiman, Trelew, route RN-3, km 1494, Estancia Pozo Hondo, 34 km South of Trelew, 43°32’43.2’’S 65°28’38.9’’W, 220 m, steppe, 15-XI-2009.

ARG-09-45: Chubut, Rawson, Trelew, route RN-3, km 1467, 7 km South of Trelew, 43°20’26.0’’S 65°18’26.2’’W, 56 m, steppe, 15-XI-2009.

ARG-09-46: Chubut, Gaiman, Dolavon, route RN-25, km 63, intersection to route 40, 43°17’46.9’’S 65°48’00.8’’W, 81 m, steppe, 16-XI-2009.

ARG-09-47: Chubut, Gaiman, Dolavon, route RN-25, km 96, 40 km West of Dolavon, 43°27’15.0’’S 66°07’10.9’’W, 122 m, steppe, 16-XI-2009.

ARG-09-48: Chubut, Gaiman, 1 km North of Dique F. Ameghino on river Chubut, 43°41’20.0’’S 66°28’43.6’’W, 241 m, steppe, 16-XI-2009.

ARG-09-49: Chubut, Mártires, Las Plumas, Alto de Las Plumas, route RN-25, km 196, 43°39’13.0’’S 67°14’31.0’’W, 382 m, steppe, 16-XI-2009.

ARG-09-50: Chubut, Paso de Indios, Los Altares, Valle de las Ruinas, route RN-25, km 292, 43°50’26.0’’S 68°11’28.5’’W, 228 m, riverine grasses, 16-XI-2009.

ARG-09-51: Chubut, Paso de Indios, Paso de Indios, route RN-25, km 372, 11 km West of Paso de Indios, 43°51’29.2’’S 69°06’42.5’’W, 546 m, steppe, 17-XI-2009.

ARG-09-52: Chubut, Paso de Indios, Paso de Indios, Estancia Cajón de Ginebra Chico, route RN-25, km 406, 40 km West of Paso de Indios, 43°44’51.2’’S 69°30’51.9’’W, 783 m, steppe, 17-XI-2009.

ARG-09-53: Chubut, Languiñeo, Tecka, Estancia los Pocitos, route 62, 65 km East of Tecka, 43°37’57.2’’S 70°06’38.2’’W, 712 m, steppe, 17-XI-2009.

ARG-09-54: Chubut, Languiñeo, Tecka, Estancia Río Tecka, intersection to route RN-40, 4 km North of Tecka, 43°28’04.3’’S 70°49’54.3’’W, 671 m, steppe, 17-XI-2009.

ARG-09-55: Chubut, Futaleufú, Esquel, Estancia San Román, route RN-25, km 589, 35 km East of Esquel, 43°03’00.4’’S 70°57’15.0’’W, 660 m, xerophyllous scrubland with *Larrea* sp., 17-XI-2009.

ARG-09-56: Chubut, Futaleufú, Esquel, Los Alerces NP, Villa Futalaufquen, Puerto Limonao, intersection to sendero 5 Saltos and Krüger lake, 42°51’41.7’’S 71°37’52.8’’W, 626 m, *Nothofagus dombeyii* forest, 18-XI-2009.

ARG-09-57: Chubut, Futaleufú, Esquel, Los Alerces NP, Villa Futalaufquen, Puerto Limonao, 42°51’46.1’’S 71°37’40.2’ W, 543 m, *Nothofagus dombeyii* forest, 18-XI-2009.

ARG-09-58: Chubut, Futaleufú, Esquel, Los Alerces NP, Poblado Los Rosales, road to La Torta, 42°51’19.4’’S 71°35’23.8’’W, 750 m, *Nothofagus dombeyii* forest, 18-XI-2009.

ARG-09-59: Chubut, Futaleufú, Esquel, Los Alerces NP, La Cascada, route 71, 4 km de Villa Futalaufquen, 42°53’11.6’’S 71°35’51.6’’W, 560 m, *Nothofagus dombeyii* forest, 19-XI-2009.

ARG-09-60: Chubut, Futaleufú, Esquel, Los Alerces NP, sección Arrayanes, route 71, 2 km South of Puerto Chucao, 42°44’03.9’’S 71°44’25.6’’W, 528 m, *Nothofagus dombeyii* forest, 19-XI-2009.

ARG-09-61: Chubut, Cushamen, Lago Puelo, Lago Puelo NP, path to the Mirador, 42°05’57.8’’S 71°36’18.4’’W, 292 m, mixed *Nothofagus* and *Astrocedrus* spp. forest, 20-XI-2009.

ARG-09-62: Río Negro, Bariloche, San Carlos de Bariloche, Parque Nacional Nahuel Huapi, Villa Cerro Catedral ski resort, 41°09’49.5’’S 71°27’34.7’’W, 1364 m, *Nothofagus* spp. forest, 21-XI-2009.

ARG-09-63: Río Negro, Bariloche, San Carlos de Bariloche, Parque Nacional Nahuel Huapi, Challhuaco, Neumeyer shelter, 41°15’33.1’’S 71°17’31.6’’W, 1438 m, *Nothofagus pumilio* forest, 22-XI-2009.

Table 1. (*Continuation*)

ARG-09-64: Río Negro, Pilcaniyeu, Comallo, route RN-23, km 471, 33 km southeast Comallo, 41°14'10.3''S 70°06'35.5''W, 1070 m, steppe, 23-XI-2009.

ARG-09-65: Río Negro, Pilcaniyeu, Comallo, route RN-23, km 492,12 km South of Comallo, 41°06'18.5''S 70°12'47.9''W, 936 m, steppe, 23-XI-2009.

ARG-09-66: Río Negro, Pilcaniyeu, Pilcaniyeu, route RN-23, km 542, Pilcaniyeu Viejo, 11 km North of Pilcaniyeu, 41°02'30.5''S 70°38'20.9''W, 1020 m, steppe, 23-XI-2009.

ARG-09-67: Chubut, Cushamen, Lago Puelo, Lago Puelo NP, Los Olivillos bay, 42°05'51.4''S 71°41'40.3''W, 200 m, Valdivian forest transition to *Nothofagus dombeyii* forest, 24-XI-2009.

ARG-09-68: Chubut, Cushamen, Lago Puelo, Lago Puelo NP, Los Hitos, 42°06'08.1''S 71°43'28.8''W, 243 m, Valdivian forest transition to *Nothofagus dombeyii* forest, 24-XI-2009.

ARG-09-69: Chubut, Cushamen, Lago Puelo, Lago Puelo NP, Puntilla Cerro Cuevas, 42°07'33.0''S 71°38'59.5''W, 223 m, Valdivian forest transition to *Nothofagus dombeyii* forest, 24-XI-2009.

ARG-10-01: Santa Cruz, Deseado, Caleta Olivia, La Lobería, route RN-3, km 1890, 37 km North of Caleta Olivia, 46°16'39.8"S 67°36'00.2"W, 9 m, steppe, 16-IV-2010.

ARG-10-02: Santa Cruz, Deseado, Caleta Olivia, route RN-3, km 1920, 12 km South of Caleta Olivia, 46°31'13.8"S 67°27'53.0"W, 7 m, steppe, 16-IV-2010.

ARG-10-03: Santa Cruz, Deseado, Fitz Roy, route RN-3, km 1975, 8 km North of Fitz Roy, 46°57'41.6"S 67°15'36.9"W, 235 m, steppe, 16-IV-2010.

ARG-10-04: Santa Cruz, Deseado, Puerto Deseado, Cerro Blanco, route RN-281, km 85, 85 km Northeast of Puerto Deseado, 47°22'11.4"S 66°49'03.2"W, 150 m, steppe, 16-IV-2010.

ARG-10-05: Santa Cruz, Deseado, Puerto Deseado, route RN-281, km 3, 3 km West of Puerto Deseado, 47°44'39.9"S 65°55'31.9"W, 35 m, steppe, 17-IV-2010.

ARG-10-06: Santa Cruz, Deseado, Puerto Deseado, Pampa Alta, route RN-281, km 43, 43 km Northeast of Puerto Deseado, 47°33'13.5"S 66°18'46.2"W, 117 m, steppe, 17-IV-2010.

ARG-10-07: Santa Cruz, Deseado, Pico Truncado, Minerales, route 43, km 42, 16 km East of Pico Truncado, 46°51'10.5"S 67°45'00.2"W, 264 m, steppe, 17-IV-2010.

ARG-10-08: Santa Cruz, Deseado, Las Heras, Piedra Clavada, route 43, km 112, 31 km East of Las Heras, 46°35'52.5"S 68°32'32.3"W, 320 m, steppe, 17-IV-2010.

ARG-10-09: Santa Cruz, Deseado, Las Heras, route 43, km 153, 8 km West of Las Heras, 46°33'41.2"S 69°00'21.5"W, 341 m, steppe, 17-IV-2010.

ARG-10-10: Santa Cruz, Deseado, Las Heras, estancia María Aiken, route 43 intersection with route 39 to Bajo Caracoles, 55 km East of Las Heras, 46°36'51.8"S 69°36'07.1"W, 356 m, steppe, 18-IV-2010.

ARG-10-11: Santa Cruz, Lago Buenos Aires, Perito Moreno, El Pluma, estancia Maremma, route 43, 80 km East of Perito Moreno, 46°28'13.0"S 70°02'36.4"W, 360 m, steppe, 18-IV-2010.

ARG-10-12: Santa Cruz, Lago Buenos Aires, Perito Moreno, route 43, 30 km East of Perito Moreno and 8 km West of the intersection with route RN-40, 46°28'50.0"S 70°38'29.5"W, 573 m, steppe, 18-IV-2010.

ARG-10-13: Santa Cruz, Lago Buenos Aires, Perito Moreno, estancia El Unco, route RN-40, 90 km South of Perito Moreno and 35 km North of Bajo Caracoles, 47°13'01.1"S 70°53'42.9"W, 690 m, steppe, 18-IV-2010.

ARG-10-14: Santa Cruz, Río Chico, Bajo Caracoles, Hipólito Yrigoyen, Pueyrredón lake, route 39, 15 km Nothwest of Hipólito Yrigoyen and 90 km West of Bajo Caracoles, 47°28'41.5"S 71°47'10.7"W, 300 m, steppe, 19-IV-2010.

ARG-10-15: Santa Cruz, Río Chico, Hipólito Yrigoyen, route 39, 2 km East of Hipólito Yrigoyen, 47°34'01.6"S 71°42'04.3"W, 200 m, steppe, 19-IV-2010.

ARG-10-16: Santa Cruz, Río Chico, Hipólito Yrigoyen, Río Blanco, route 39, 30 km East of Hipólito Yrigoyen and 45 km Southwest of Bajo Caracoles, 47°34'32.4"S 71°22'42.3"W, 627 m, steppe, 19-IV-2010.

ARG-10-17: Santa Cruz, Lago Buenos Aires, Perito Moreno, estancia El Rincón, route RN-40, 45 km South of Perito Moreno, 46°55'56.9"S 70°42'47.4"W, 680 m, steppe, 19-IV-2010.

ARG-10-18: Santa Cruz, Lago Buenos Aires, Los Antiguos, Monte Zeballos, route 41, 48 km North of Paso Roballos and 50 km South of Los Antiguos, 46°51'14.4"S 71°52'39.6"W, 908 m, steppe, 20-IV-2010.

ARG-10-19: Santa Cruz, Lago Buenos Aires, Los Antiguos, Monte Zeballos, Jeinemeni river, estancia La Frontera, route 41, 40 km South of Los Antiguos, 46°73'31.9"S 71°47'48.0"W, 884 m, 4, steppe, 20-IV-2010.

ARG-10-20: Santa Cruz, Lago Buenos Aires, Los Antiguos, río Jeinemeni, route 41, 15 km South of Los Antiguos, 46°39'42.3"S 71°36'28.3"W, 558 m, steppe, 20-IV-2010.

ARG-10-21: Santa Cruz, Lago Buenos Aires, Perito Moreno, Lago Buenos Aires, Chacra Morielita, route 43, 21 km West of Perito Moreno, 46°36'06.9"S 71°11'49.9"W, 235 m, steppe, 20-IV-2010.

ARG-10-22: Santa Cruz, Lago Buenos Aires, Perito Moreno, estancia Juanita, route RN-40, 68 km North of Perito Moreno and 5 km South of estancia Juanita, 46°07'57.0"W, 70°35.51.0"W, 712 m, steppe, 21-IV-2010.

ARG-10-23: Chubut, Río Senguer, Río Mayo, route RN-40, km 1350, 15 km South of Río Mayo, 45°47'27.6"S 70°18'35.1"W, 553 m, steppe, 21-IV-2010.

ARG-10-24: Chubut, Río Senguer, Río Mayo, Pastos Blancos, estancia La Porfía, route ex RN-40, km 1900, 38 km northeast of Río Mayo, 45°25'04.7"S 70°26'22.5"W, 567 m, steppe, 21-IV-2010.

Table 1. (*Continuation*)

ARG-10-25: Chubut, Río Senguer, Alto Río Senguer, intersection of route 56 to Sarmiento and route ex 40 to Gobernador Costa, 10 km North of Alto Río Senguer, 44°58'32.9"S 70°46'55.7"W, 668 m, steppe, 21-IV-2010.

ARG-10-26: Chubut, Río Senguer, Alto Río Senguer, Fontana lake, Pueblo Brondo, route 57, 89 km West of Alto Río Senguer, 44°51'20.1"S 71°39'35.3"W, 938 m, *Nothofagus pumilio* forest, 22-IV-2010.

ARG-10-27: Chubut, Río Senguer, Alto Río Senguer, Fontana lake, route 57, 69 km West of Alto Río Senguer, 44°53'58.2"S 71°28'36.0"W, 975 m, *Nothofagus pumilio* forest, 22-IV-2010.

ARG-10-28: Chubut, Río Senguer, Alto Río Senguer, estancia Arroyo Victoria, route 57, 55 km West of Alto Río Senguer, 44°52'48.8"S 71°19'11.9"W, 1043 m, mixed *Nothofagus* spp. riverine forest, 22-IV-2010.

ARG-10-29: Chubut, Tehuelches, Río Pico, route 19, 7 km East of Dr. Atilio Viglione community, 44°10'45.2"S 71°34'32.5"W, 632 m, *Nothofagus pumilio* forest, 23-IV-2010.

ARG-10-30: Chubut, Languiñeo, Corcovada, General Vintter lake, route RP-44, 6 km North of Vintter lake and 5 km South of Guacho lake, 43°51'30, 1"S 71°25'53.0"W, 1039 m, *Nothofagus pumilio* forest, 23-IV-2010.

ARG-10-31: Chubut, Languiñeo, Corcovada, route RP-44, 25 km South of Corcovado, 43°43'11.4"S 71°24'34.0"W, 830 m, *Nothofagus pumilio* forest, 23-IV-2010.

ARG-10-32: Chubut, Futaleufú, Trevelin, Los Alerces NP, Futaleufú hydroelectric plant, 2 km from the park entrance and 12 km West of Trevelin , 43°07'56.2"S 71°35'27.1"W, 340 m, *Austrocedrus chilensis* forest, 24-IV-2010.

ARG-10-33: Chubut, Futaleufú, Trevelin, Los Alerces NP, Futaleufú hydroelectric plant, 43°07'52.3"S 71°38'22.0"W, 420 m, *Austrocedrus chilensis* forest, 25-IV-2010.

ARG-10-34: Chubut, Futaleufú, Trevelin, Los Alerces NP, Amutui Quimei dam, 43°07'00.1"S 71°39'11.0"W, 511 m, *Austrocedrus chilensis* forest, 25-IV-2010.

ARG-10-35: Chubut, Futaleufú, Trevelin, Los Alerces NP, Puerto Limonao, Los Pumas river, 42°51'45.5"S 71°37'38.0"W, 560 m, *Austrocedrus chilensis* forest, 25-IV-2010.

ARG-10-36: Chubut, Futaleufú, Trevelin, Los Alerces NP, Irigoyen falls, 42°51'37.6"S 71°36'09.6"W, 520 m, *Austrocedrus chilensis* forest, 25-IV-2010.

ARG-10-37: Chubut, Tehuelches, Gobernador Costa, estancia Paulina, route RN-40, km 1636, 43 km South of Tecka and 44 Northwest of Gobernador Costa , 43°49'57.7"S 70°55'12.4"W, 855 m, steppe, 26-IV-2010.

ARG-10-38: Chubut, Tehuelches, Gobernador Costa, route RN-40, km 1580, 10 km South of Gobernador Costa, 44°08'00.7"S 70°29'34.0"W, 687 m, steppe, 26-IV-2010.

ARG-10-39: Chubut, Tehuelches, Gobernador Costa, route RN-40, km 1528, 58 km South of Gobernador Costa and 6 km South of estancia Nueva Lubecka, 44°34'06.3"S 70°22'56.6"W, 600 m, steppe, 26-IV-2010.

ARG-10-40: Chubut, Río Senguer, Alto Río Senguer, route RN-40, km 1472, 9 km South of the intersection to route 56 to Alto Río Senguer and 4 km North of Los Tamariscos, 44°59'31.5"S 70°02'16.8"W, 546 m, steppe, 26-IV-2010.

ARG-10-41: Chubut, Río Senguer, Río Mayo, route RN-40, km 1422, 10 km South of the intersection to Facundo and 6 km from the intersection with route RN 26, 45°24'34.4"S 69°52'10.6"W, 473 m, steppe, 26-IV-2010.

ARG-10-42: Chubut, Sarmiento, Sarmiento, Los Manantiales, route RN-26, km 182, 45 km West of Sarmiento, 45°28'35.7"S 69°29'34.0"W, 560 m, steppe, 26-IV-2010.

ARG-10-43: Chubut, Sarmiento, Sarmiento, Bosque Petrificado José Ormaechea NR, 2 km from the Entrance to the Reserve, 45°47'42.4"S 69°03'48.8"W, 300 m, steppe, 27-IV-2010.

ARG-10-44: Chubut, Sarmiento, Sarmiento, route RN-26, km 97, 40 km Southeast Sarmiento, 45°46'21.0"S 68°39'08.1"W, 350 m, steppe, 27-IV-2010.

ARG-10-45: Chubut, Escalante, Comodoro Rivadavia, Pampa del Castillo, route RN-26, km 45, 55 km West of Comodoro Rivadavia, 45°47'33.2"S 68°05'13.4"W, 620 m, steppe, 27-IV-2010.

ARG-11-01: Santa Cruz, Lago Argentino, El Calafate, estancia La Josefina, RP-11, 8 km East of the intersection to the airport, 50°19'10.2"S 71°57'14.6"W, 460 m, steppe, 18-I-2011.

ARG-11-02: Santa Cruz, Lago Argentino, El Calafate, southern side of the Perito Moreno glacier, 50°29'31.9"S 73°02'59.2"W, 202 m, *Nothofagus* spp. forest, 18-I-2011.

ARG-11-03: Santa Cruz, Lago Argentino, El Calafate, southern edge of the Perito Moreno glacier, 50°29'29.5"S 73°03'21.7"W, 212 m, *Nothofagus* spp. forest, 8-I-2011.

ARG-11-04: Santa Cruz, Lago Argentino, El Calafate, Los Glaciares NP, km 13 of the track to Perito Moreno glaciar mirador, 50°28'57.7"S 72°52'52.3"W, 211 m, *Nothofagus* spp. forest, 18-I-2011.

ARG-11-05: Santa Cruz, Lago Argentino, El Calafate, Lago Roca, towards La Angostura, 2 km. East of the entrance to la Estancia Nibepo Aike, 50°33'24.2"S 72°50'47.1"W, 209 m, *Nothofagus* spp. forest, 18-I-2011.

ARG-11-06: Santa Cruz, Lago Argentino, El Calafate, Lago Roca, Hacienda Cerrillo Malo, 50°28'05.7"S 72°37'32.1"W, 210 m, steppe, 18-I-2011.

ARG-11-07: Santa Cruz, Lago Argentino, El Calafate, RN-40 to Tres Lagos, Estancia La Irene, 50°01'47.1"S 72°09'33.6"W, 361 m, steppe, 19-I-2011.

ARG-11-08: Santa Cruz, Lago Argentino, El Calafate, RN-40 to Tres Lagos, Estancia La Silesia, 9 km South of the intersection to El Chaltén, 49°43'45.6"S 71°57'25.0"W, 259 m, steppe, 19-I-2011.

ARG-11-09: Santa Cruz, Lago Argentino, El Chaltén, RP-23, km 50, 49°32'15.0"S 72°29'20.8"W, 258 m, steppe, 19-I-2011.

ARG-11-10: Santa Cruz, Lago Argentino, El Chaltén, Los Glaciares NP, Bahía Túnel, 7 km West of the intersection with RP-23, 49°23'26.3"S 72°52'02.9"W, 269 m, steppe, 19-I-2011.

Table 1. (*Continuation*)

ARG-11-11: Santa Cruz, Lago Argentino, 31 km North of El Chaltén, on track to Lago del Desierto, Salto del Anillo, 49°07'06.5"S 72°55'28.7"W, 471 m, 6, *Nothofagus* spp. forest, 19-I-2011.

ARG-11-12: Santa Cruz, Lago Argentino, 29 km North of El Chaltén, on track to Lago del Desierto, Milodon river, 49°08'01.2"S 72°55'52.1"W, 470 m, 5, *Nothofagus* spp. forest, 19-I-2011.

ARG-11-13: Santa Cruz, Lago Argentino, 25 km North of El Chaltén, on track to Lago del Desierto, Mosquito stream, 49°09'33.4"S 72°56'50.5"W, 457 m, 5, *Nothofagus* spp. forest, 19-I-2011.

ARG-11-14: Santa Cruz, Lago Argentino, Tres Lagos, RN-40, 5 km North of Tres Lagos, 49°32'49.7"S 71°28'03.3"W, 258 m, steppe, 20-I-2011.

ARG-11-15: Santa Cruz, Lago Argentino, Tres Lagos, RN-40, 35 km North of Tres Lagos, Estancia La Lucía, 49°15'07.5"S 71°20'17.8"W, 478 m, steppe, 20-I-2011.

ARG-11-16: Santa Cruz, Río Chico, Gobernador Gregores, RN-40, 70 km West of Gobernador Gregores, Lago Cardiel, 48°56'06.6"S 71°02'06.1"W, 370 m, steppe, 20-I-2011.

ARG-11-17: Santa Cruz, Río Chico, Gobernador Gregores, Perito Moreno NP, Lago Burmeister, 47°57'01.9"S 72°07'11.5"W, 905 m, *Nothofagus* spp. forest, 21-I-2011.

ARG-11-18: Santa Cruz, Río Chico, Gobernador Gregores, RP-37, 20 km East of the entrance to Perito Moreno NP, Estancia Beltza, 48°00'49.1"S 71°46'54.0"W, 840 m, steppe, 21-I-2011.

ARG-11-19: Santa Cruz, Río Chico, Gobernador Gregores, RN-40, intersection with RP-35, Cerro Las Horquetas, 48°14'11.2"S 71°11'50.6"W, 600 m, steppe, 21-I-2011.

ARG-11-20: Santa Cruz, Río Chico, Gobernador Gregores, RN-40, km. 958, intersection with RP-29, Casa Riera, Río Chico bridge, 48°24'19.4"S 70°32'47.0"W, 450 m, steppe, 21-I-2011.

ARG-11-21: Santa Cruz, Río Chico, Gobernador Gregores, RN-40, 20 km South of Casa Riera, Estancia La Lucha, 48°31'32.4"S 70°26'09.7"W, 470 m, steppe, 21-I-2011.

ARG-11-22: Santa Cruz, Río Chico, Gobernador Gregores, RP-25, 20 km East of Gobernador Gregores, 48°46'47.9"S 70°00'55.6"W, 346 m, steppe, 22-I-2011.

ARG-11-23: Santa Cruz, Magallanes, Puerto San Julián, RP-25, 73 km East of Gobernador Gregores, 48°54'39.7"S 69°21'04.2"W, 285 m, steppe, 22-I-2011.

ARG-11-24: Santa Cruz, Magallanes, Puerto San Julián, RP-25, 125 km East of Gobernador Gregores, 48°57'01.0"S 68°39'52.3"W, 225 m, steppe, 22-I-2011.

ARG-11-25: Santa Cruz, Magallanes, Puerto San Julián, RP-25, 180 km East of Gobernador Gregores, Bajo John, Ceferino Valenzuela, 49°12'24.3"S 68°10'58.9"W, 204 m, steppe, 22-I-2011.

ARG-11-26: Santa Cruz, Magallanes, Puerto San Julián, RP-25, 3 km West of the intersection with RN-3, Puerto San Julián, 49°17'43.0"S 67°49'19.7"W, 40 m, steppe, 22-I-2011.

ARG-11-27: Santa Cruz, Magallanes, Puerto San Julián, RN-3, km 2219, 40 km North of Puerto San Julián, 49°01'43.6"S 67°39'44.6"W, 13 m, steppe, 22-I-2011.

ARG-11-28: Santa Cruz, Corpen Aike, Comandante Luis Piedra Buena, RN-3, km 2303, Estancia La Silvita, Gran Bajo de San Julián, 49°37'56.2"S 68°10'05.3"W, 95 m, steppe, 23-I-2011.

ARG-11-29: Santa Cruz, Corpen Aike, Comandante Luis Piedra Buena, RN-3, km 2343, Río Chico bridge, 49°46'40.6"S 68°38'35.8"W, 11 m, steppe, 23-I-2011.

ARG-11-30: Santa Cruz, Corpen Aike, Puerto Santa Cruz, 3 km West of Puerto de Punta Quilla , 50°06'32.3"S 68°27'32.5"W, 5 m, steppe, 24-I-2011.

ARG-11-31: Santa Cruz, Corpen Aike, Puerto Santa Cruz, Monte León NP, Cabeza de León, 50°21'20.8"S 68°53'00.1"W, 15 m, steppe, 24-I-2011.

ARG-11-32: Santa Cruz, Corpen Aike, Puerto Santa Cruz, Monte León NP, beginning of path to Pingüinera, 50°20'53.6"S 68°55'30.6"W, 25 m, steppe, 24-I-2011.

ARG-11-33: Santa Cruz, Corpen Aike, Puerto Santa Cruz, Monte León NP, mirador Cabeza de León, 50°20'36.5"S 68°56'29.7"W, 56 m, steppe, 24-I-2011.

ARG-11-34: Santa Cruz, Corpen Aike, Puerto Santa Cruz, Monte León NP, Los Guanacos canyon, 50°19'18.3"S 68°58'24.2"W, 150 m, steppe, 24-I-2011.

ARG-11-35: Santa Cruz, Corpen Aike, Puerto Santa Cruz, Monte León NP, Los Guanacos canyon, 8 km South of the intersection with RN-3, km 2404, 50°17'46.4"S 69°00'14.6"W, 264 m, steppe, 24-I-2011.

ARG-11-36: Santa Cruz, Corpen Aike, Puerto Santa Cruz, RP-9, 23 km West of the intersection with RN-3, Estancia San Benito, 50°16'04.7"S 69°24'46.6"W, 358 m, steppe, 25-I-2011.

ARG-11-37: Santa Cruz, Güer Aike, Río Gallegos, Paraje Le Marchand, RN-3, km 2475, 50°44'33.2"S 69°28'50.3"W, 272 m, steppe, 25-I-2011.

ARG-11-38: Santa Cruz, Güer Aike, Río Gallegos, Estancia Coy Aike, RN-3, km 2529, intersection to Río Coig (Coyle), 51°09'30.4"S 69°31'10.2"W, 26 m, steppe, 25-I-2011.

ARG-11-39: Santa Cruz, Güer Aike, Río Gallegos, RN-3, km 2580, intersection to Yacimiento El Indio, 6 km North of Güer Aike, 51°35'01.5"S 69°37'27.3"W, 135 m, steppe, 25-I-2011.

ARG-11-40: Santa Cruz, Güer Aike, Río Gallegos, Cabo Virgenes lighthouse, RN-40, km 0, 52°19'59.7"S 68°21'25.4"W, 40 m, steppe, 26-I-2011.

ARG-11-41: Santa Cruz, Güer Aike, Río Gallegos, Cabo Virgenes RP, Pingüinera, 52°21'50.9"S 68°24'20.2"W, -4 m, steppe, 26-I-2011.

Table 1. (*Continuation*)

ARG-11-42: Santa Cruz, Güer Aike, Río Gallegos, RN-1, 51 km. West of Cabo Virgenes, Estancia El Condor, 52°10'58.9"S 68°59'41.1"W, 9 m, steppe, 26-I-2011.

ARG-11-43: Santa Cruz, Güer Aike, Río Gallegos, RN-1, Estancia Frailes del Cóndor, 51°54'20.4"S 69°07'43.8"W, 37 m, steppe, 26-I-2011.

ARG-11-44: Santa Cruz, Güer Aike, Río Gallegos, Punta Loyola, 51°36'59.4"S 68°58'40.2"W, 3 m, steppe, 26-I-2011.

ARG-11-45: Santa Cruz, Güer Aike, Río Gallegos, Güer Aike, RN-40, km 201, 41 km West of the intersection with RN-3, 51°43'56.2"S 70°05'17.3"W, 60 m, steppe, 27-I-2011.

ARG-11-46: Santa Cruz, Güer Aike, Río Gallegos, Güer Aike, RN-40, km 248, 88 km West of the intersection with RN-3, 51°52'35.9"S 70°39'49.4"W, 156 m, steppe, 27-I-2011.

ARG-11-47: Santa Cruz, Güer Aike, Río Gallegos, Güer Aike, RN-40, km 293, El Zurdo, 51°59'44.3"S 71°13'36.5"W, 143 m, steppe, 27-I-2011.

ARG-11-48: Santa Cruz, Güer Aike, Río Gallegos, 28 de Noviembre, RN-40, km 326, Puente Blanco, 51°53'23.5"S 71°36'53.7"W, 124 m, *Nothofagus* spp. forest, 27-I-2011.

ARG-11-49: Santa Cruz, Güer Aike, Río Gallegos, 28 de Noviembre, RP-293, 4 km South of the intersection with RN-40, Rospentek Aike, 51°40'14.5"S 72°14'12.6"W, 258 m, *Nothofagus* spp. forest, 27-I-2011.

ARG-11-50: Santa Cruz, Güer Aike, Yacimientos Río Turbio, El Valdelén ski resort, 51°34'21.1"S 72°21'19.7"W, 640 m, *Nothofagus* spp. forest, 28-I-2011.

ARG-11-51: Santa Cruz, Güer Aike, Yacimientos Río Turbio, El Valdelén ski resort, Mina 1, 51°34'19.2"S 72°20'55.5"W, 570 m, *Nothofagus* spp. forest, 28-I-2011.

ARG-11-52: Santa Cruz, Güer Aike, Yacimientos Río Turbio, El Valdelén ski resort, Chile border, 51°33'44.0"S 72°21'40.5"W, 586 m, *Nothofagus* spp. forest, 28-I-2011.

ARG-11-53: Santa Cruz, Güer Aike, Yacimientos Río Turbio, RN-40, intersection to Cancha Carrera, 42 km North of Yacimientos Río Turbio, 51°18'33.2"S 72°11'19.1"W, 432 m, *Nothofagus* spp. forest, 29-I-2011.

ARG-11-54: Santa Cruz, Güer Aike, Yacimientos Río Turbio, RN-40, intersection with RN-7, Estancia Tapi Aike, 5 km North of la estancia, 51°01'04.0"S 71°46'30.3"W, 288 m, steppe, 29-I-2011.

ARG-11-55: Santa Cruz, Güer Aike, Yacimientos Río Turbio, RN-40, Destacamento Tomas Sosa, 20 km South of the intersection with RP-5 and 50 km North of the intersection with RP-7, 50°46'29.0"S 71°25'43.1"W, 415 m, steppe, 29-I-2011.

ARG-11-56: Santa Cruz, Lago Argentino, El Calafate, RN-40, 30 km North of the intersection with RP-5, Cuesta Míguez, 50°23'28.6"S 71°30'33.2"W, 767 m, steppe, 29-I-2011.

ARG-11-57: Santa Cruz, Lago Argentino, El Calafate, RP-8, 30 km West of El Calafate, 50°20'02.5"S 72°39'53.3"W, 225 m, steppe, 30-I-2011.

ARG-11-58: Santa Cruz, Lago Argentino, El Calafate, RP-8, 25 km West of El Calafate, 50°19'14.7"S 72°35'50.2"W, 196 m, steppe, 30-I-2011.

ARG-11-59: Santa Cruz, Lago Argentino, El Calafate, RP-8, 20 km West of El Calafate, 50°20'19.7"S 72°33'08.8"W, 193 m, steppe, 30-I-2011.

ARG-11-60: Santa Cruz, Lago Argentino, El Calafate, RP-8, 15 km West of El Calafate, 50°20'57.5"S 72°29'42.8"W, 185 m, steppe, 30-I-2011.

(Colwell & Coddington, 1994; Colwell & al., 2004) and the accumulation curve adjusted according to Clench where $S_n=(a*n)/[1+(b*n)]$ and S_n is the number of species accumulated for a unit of collecting effort (n) (Jiménez-Valverde & Hortal, 2003). Each collecting site was considered as the unit of collecting effort, using the total number of species found with the programme EstimateS v 7.5.2 (http//viceroy.eeb.uconn.edu/estimates). The adjustment according to Clench was carried out with the programme Statistica v 12, using the Simplex and Quasi-Newton method of adjustment (Jiménez-Valverde & Hortal, 2003).

To examine community similarity, the Sørensen coefficient of community (CC) index was used, which considers the presence or absence of species in the study areas compared using the formula CC=2z / (x+y), where z= the number of species in common to both communities, and where x and y equal the number of species in communities A and B, respectively (Sørensen, 1948).

RESULTS

As a result of this survey so far, 1134 collections of myxomycetes have been identified, either specimens that had developed in the field under natural conditions or those that were recovered from moist chamber cultures. In total, 138 taxa (this includes 5 varieties) representing 31 genera of myxomycetes have resulted.

Annotated list of species

All the identifiable myxomycetes resulting from this survey are arranged alphabetically by genus and then species in the list that follows. Information is provided on the source of each record (either a field collection or a collection obtained from a moist chamber [mc] culture), the pH of the culture in which the specimen appeared, the substrate upon which it was collected or cultured and the locality from which the specimen itself, or the sample of dead plant material used to prepare the moist chamber culture, was collected. Records of particular interest or species that are new to South America have additional comments. Nomenclature follows Lado (2005-2013). The abbreviation 'cf.' in the name of a taxon indicates that the specimen representing the source of the record could not be identified with certainty. This usually indicates scanty or aberrant material. Unless otherwise stated, comments on the distribution of the species in the Neotropics are based on Lado & Wrigley de Basanta (2008). The species marked with (†), (°) or an asterisk (*) are new records for the Neotropics, South America or Argentina respectively.

Arcyria afroalpina Rammeloo
ARG-09-42: *Mulinum spinosum* twigs (mc, pH 6.28), egc60 (MA-Fungi 83613). ARG-09-65: *Colliguaja integerrima* (mc,pH5.70), egc61 (MA-Fungi 83614).

This species was originally described from the mountains of tropical Africa (Karisimbi volcano, Rwanda) at 3400 m (Rammeloo, 1981), but it seems to be widely distributed in the Neotropics (Lado & Wrigley de Basanta, 2008) and the collections cited here and in Lado & al. (2013), some from almost sea level, suggest that the species is not confined to high mountains.

Arcyria cinerea (Bull.) Pers.
ARG-09-18: sheep droppings (mc, pH 6.45), egc 52 (MA-Fungi 83606). ARG-09-27: *Ephedra ochreata* wood (mc, pH 6.34) ET-12177. ARG-09-38: *Sporobolus* spp. leaf litter (mc, pH 6.64), egc54 (MA-Fungi 83607). ARG-09-40: *Jarava patagonica* leaf litter (mc, pH 6.59), egc55 (MA-Fungi 83612). ARG-09-44: *Prosopidastrum globosum* bark (mc, pH 6.85), egc56 (MA-Fungi 83609). ARG-09-46: *Chuquiraga avellanedae* bark (mc, pH 6.71), egc57 (MA-Fungi 83610). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21072 (MA-Fungi 86474). ARG-10-01: *Colliguaja integerrima* leaf litter (mc, pH 5.85), egc58 (MA-Fungi 83611); *Chuquiraga avellanedae* leaf litter (mc, pH 6.17), egc59 (MA-Fungi 83612). ARG-10-33: *Fitzroya cupressoides* bark (mc, pH 5,8), dwb 3446; (mc, pH 3.9), dwb 3458.

Arcyria denudata (L.) Wettst.
ARG-09-60: *Nothofagus dombeyii* wood, Lado 20518 (MA-Fungi 83046). ARG-09-67: *Nothofagus sp*. wood, Lado 21001 (MA-Fungi 83215). ARG-10-27: *Nothofagus pumilio* wood, Lado 21163 (MA-Fungi 83327). ARG-11-04: *Nothofagus pumilio* wood, Lado 21354 (MA-Fungi 86475).

Arcyria ferruginea Saut.
ARG-09-67: *Nothofagus* sp. wood, Lado 20974 (MA-Fungi 86476).

Arcyria fuegiana Aramb.
ARG-09-57: *Nothofagus dombeyii wood*, Lado 20464 (MA-Fungi 86477). ARG-11-49: *Nothofagus pumilio* wood, Lado 21447 (MA-Fungi 86478).

In a previous paper (Wrigley de Basanta & al., 2010b), comments were made on this species and its similarity to the cosmopolitan *A. incarnata*, in which species it was included. The Patagonia material, however, shows characters that perfectly fit the species described by Arambarri (1972). The sporotheca is subglobose before the capillitium expands, the stalks are short, the peridium is partially fugacious, tearing from the top giving a somewhat petaloid aspect and leaving a very deep calyculus (Fig. 3A), the inner surface is ornamented with little spines (Fig. 4A). The capillitium is ornamented with cogs, spines and half-rings and especially with the bulbous spiny tips (Figs. 4B-4F) noted and illustrated by Arambarri, and the spores are (7.5-)8-10 µm diam (Figs. 4G-4H). All these characters distinguish *A. fuegiana* from *A. incarnata* and for this reason we have reconsidered the separate identity of this species.

Arcyria incarnata (Pers. ex J.F.Gmel.) Pers.
ARG-09-61: wood, Lado 20638 (MA-Fungi 83155). ARG-10-34: *Nothofagus dombeyii* wood, Lado 21249 (MA-Fungi 83395). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21263 (MA-Fungi 83404), 21267 (MA-Fungi 83408). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21287 (MA-Fungi 83426), 21292 (MA-Fungi 83431). ARG-11-11: *Nothofagus pumilio* wood, Lado 21366 (MA-Fungi 83464), 21367 (MA-Fungi 83465). ARG-11-50: *Nothofagus pumilio* wood, Lado 21520 (MA-Fungi 83559).

Arcyria obvelata (Oeder) Onsberg
ARG-10-32: *Lomatia hirsuta* wood, Lado 21208 (MA-Fungi 83364), 21209 (MA-Fungi 83365), 21210 (MA-Fungi 83366), 21211 (MA-Fungi 83367). ARG-10-33: wood, Lado 21222 (MA-Fungi 83374).

Arcyria oerstedii Rostaf.
ARG-09-09: *Nothofagus* sp. wood, Lado 20311 (MA-Fungi 82934).

Arcyria pomiformis (Leers) Rostaf.
ARG-09-58: *Nothofagus dombeyii wood*, Lado 20474 (MA-Fungi 83006). ARG-10-33: wood, Lado 21218 (MA-Fungi 86479).

Badhamia affinis Rostaf.
ARG-09-42: *Schinus johnstonii* bark (mc, pH 6.54), egc217 (MA-Fungi 83739).

†***Badhamia armillata*** Nann.-Bremek.
ARG-09-54: *Mulinum spinosum* twigs Lado 20411 (MA-Fungi 86480). ARG-10-10: *Senecio filaginoides* bark, Lado 21094 (MA-Fungi 83277). ARG-10-11: *Senecio filaginoides* twigs, Lado 21097 (MA-Fungi 86481). ARG-10-19: *Senecio* sp. twig, Lado 21106 (MA-Fungi 86482). ARG-11-16: *Senecio sp*. rotten stalks, Lado 21396 (MA-Fungi 86483), Lado 21397 (MA-Fungi 83493), 21398 (MA-Fungi 83494).

These collections are the first record for the Neotropics of this species, described originally from Holland (Nannenga-Bremekamp, 1966), and realtively common in the Patagonian steppe. They had slightly smaller spores than the original description (11-16.5 µm diam vs. 15-19 µm), but otherwise the spores were the same with dense warts and a distinct pale line.

Badhamia dubia Nann.-Bremek.
ARG-09-03: wood, Lado 20252 (MA-Fungi 86484). ARG-09-65: *Nausauvia glomerulosa* twig, Lado 20950 (MA-Fungi 83169), 20951 (MA-Fungi 83170), 20953 (MA-Fungi 83172). ARG-09-66:*Senecio* sp. twig, Lado 20957 (MA-Fungi 83176). ARG-10-13: *Senecio* sp. log, Lado 21098 (MA-Fungi 83278). ARG-10-19: *Mulinum spinosum* twig, Lado 21108 (MA-Fungi 83282), 21111 (MA-Fungi 86485), 21113 (MA-Fungi 83285). ARG-10-42: *Senecio* sp.stalk, Lado 21299 (MA-Fungi 83434). ARG-10-45: *Senecio* sp.stalk, Lado 21302 (MA-Fungi 83435), 21303 (MA-Fungi 83436), 21304 (MA-Fungi 83437), 21306 (MA-Fungi 83438), 21307 (MA-Fungi 83439), 21308 (MA-Fungi 83440), 21312 (MA-Fungi 83441). ARG-11-15: *Senecio* sp. rotten stalks, Lado 21394 (MA-Fungi 83492), 21395 (MA-Fungi 86486) ARG-11-16: *Senecio* sp. rotten stalks, Lado 21399 (MA-Fungi 83495). ARG-11-28: *Senecio* sp. twigs, Lado 21412 (MA-Fungi 83504), 21413 (MA-Fungi 83505), 21414 (MA-Fungi 83507), 21417 (MA-Fungi 83508). ARG-11-30: *Senecio* sp. twigs, Lado 21423 (MA-Fungi 83509), 21426 (MA-Fungi 83510), 21428 (MA-Fungi 83511).

A common species on the steppe. The greyish sporocarps, the entirely calcareous white capillitium (Fig. 3C), and the spores in persistent clusters of 7-12 spores, are the distinctive characters of this species appearing frequently on twigs and stalks of *Senecio*.

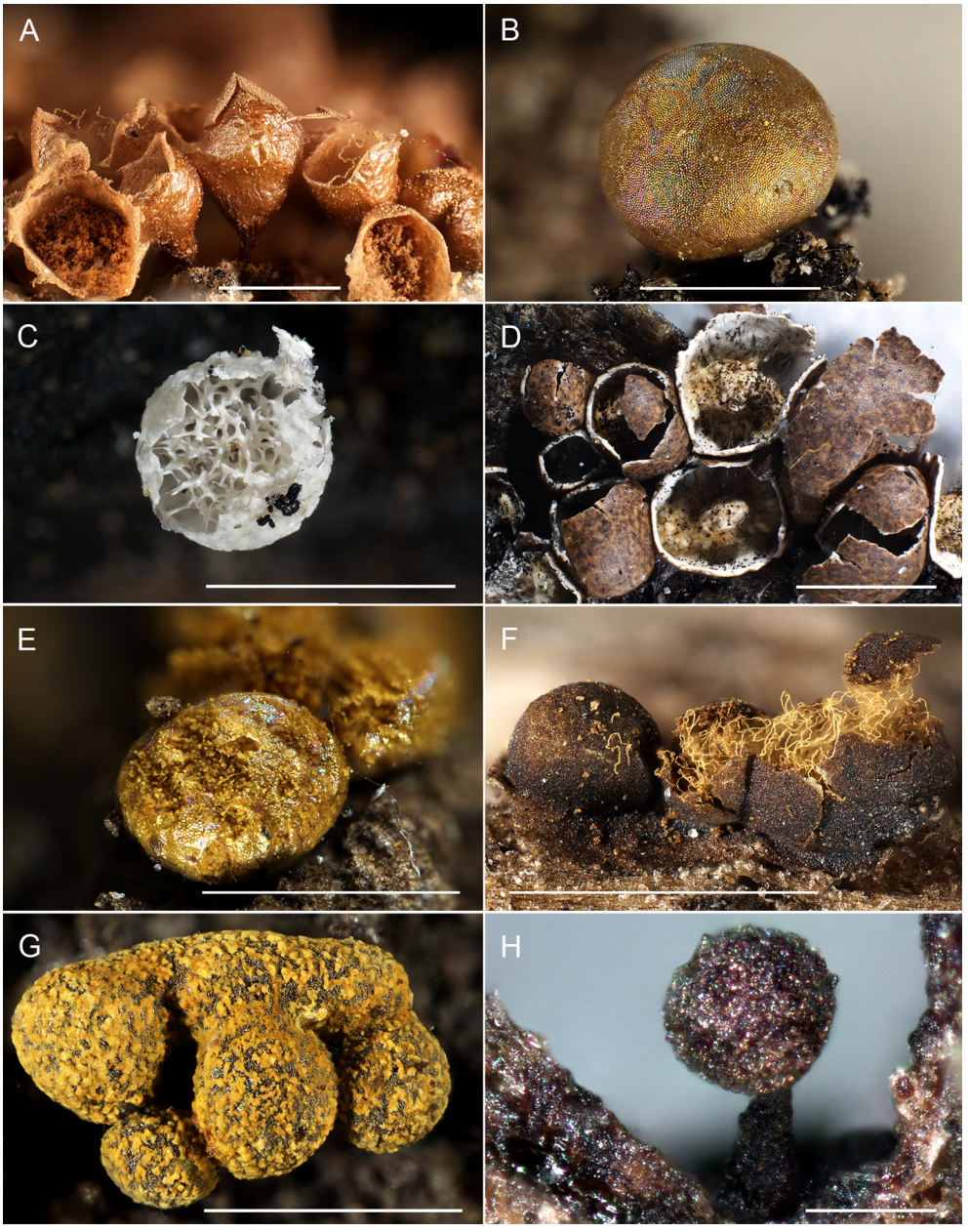

Fig. 3. A. *Arcyria fuegiana* (Lado 20464). Sporocarps showing a deep calyculus. **B.** *Calomyxa metallica* (Lado 20398). Sporocarp with a typical iridescent peridium. **C.** *Badhamia dubia* (Lado 21412). Sporocarp with strongly calcareous, white capillitium. **D.** *Diderma antarcticum* (Lado 21382). Dehisced sporocarps, some showing the columella. **E.** *Oligonema aurantium* (Lado 21165). Sporocarp. **F.** *Perichaena vermicularis* (Lado 21445). Sporophores with abundant capillitial threads. **G.** *Physarum superbum* (Lado 21509). Plasmodiocarp and short sporocarp. **H.** *Protophysarum phloiogenum* (egc 211). Iridescent sporocarp. Bar: A, C-G=1 mm; B=0.5 mm; H=0.1 mm.

Badhamia foliicola Lister
ARG-10-25: *Senecio filaginoides* log, Lado 21117 (MA-Fungi 86487). ARG-11-31: *Lepidophyllum cupressiforme* bark (mc, pH 6.5), dwb 3491.

Badhamia macrocarpa (Ces.) Rostaf.
ARG-09-04: log of an unidentified bush, Lado 20257 (MA-Fungi 86488), 20258 (MA-Fungi 86489). ARG-10-02: *Atriplex* sp. log, Lado 21088 (MA-Fungi 86491), 21089 (MA-Fungi 86492); *Limonium* sp. leaves, Lado 21090 (MA-Fungi 86490). ARG-10-04: *Senecio* sp. stalk, Lado 21092 (MA-Fungi 86493), 21093 (MA-Fungi 86494). ARG-10-42: *Senecio* sp. stalk, Lado 21298 (MA-Fungi 86495). ARG-10-43: *Senecio* sp. stalk, Lado 21300 (MA-Fungi 86496). ARG-11-40: rotten log, Lado 21439 (MA-Fungi 86497).

Badhamia melanospora Speg.
ARG-09-35: *Maihueniopsis darwinii* remains (mc, pH 7.9), dwb 3404, (mc, pH 8.4), dwb 3398. ARG-09-48: *Austrocactus* sp., Lado 20408 (MA-Fungi 82950), 20409 (MA-Fungi 82951); *Austrocactus patagonicus* (mc, pH 7.7), dwb 3427, (mc, pH 7.6), dwb 3414; *Schinus johnstonii* bark (mc, pH 6.50), egc207 (MA-Fungi 83733). ARG-09-51: *Maihuenia patagonica* remains (mc, pH 6.5), dwb 3431, (mc, pH 5.6), dwb 3433. ARG-09-64: *Grindelia chiloensis* twigs (mc, pH 6.48), egc277 (MA-Fungi 83746). ARG-10-03: *Maihueniopsis darwinii* (mc, pH 6.7),

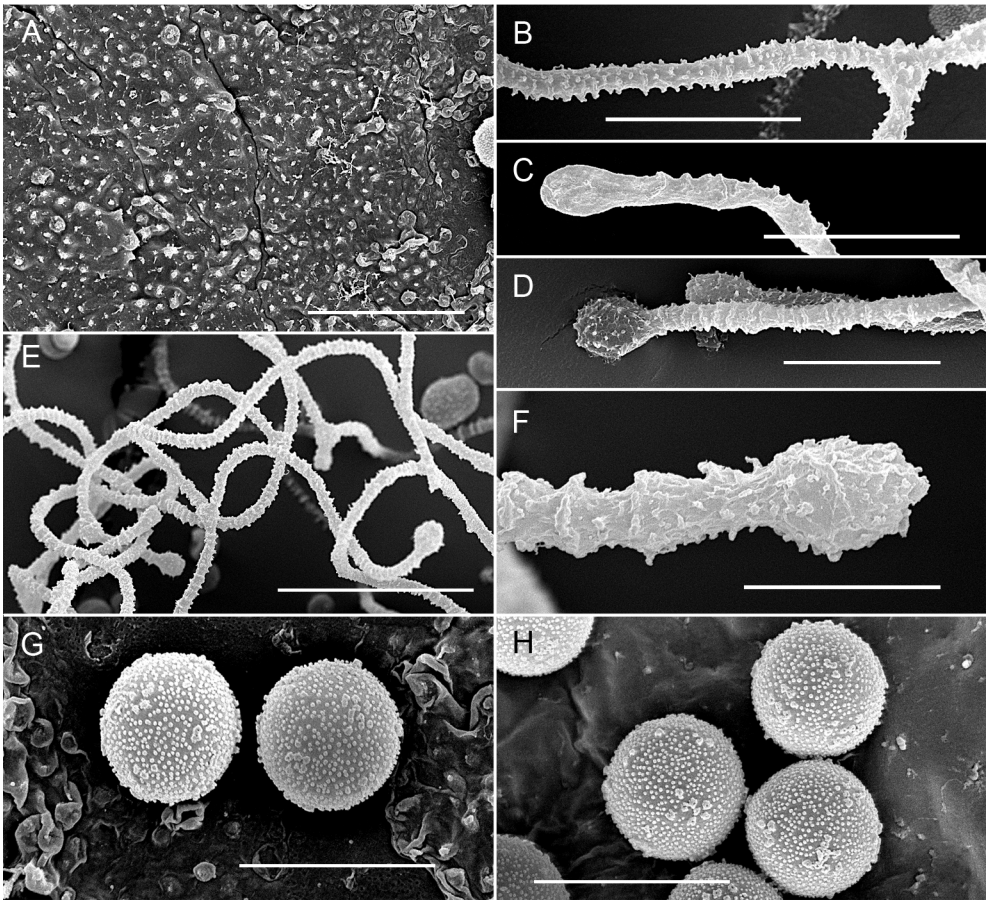

Fig. 4. *Arcyria fuegiana* (Lado 21447) by SEM. **A.** Peridial inner surface. **B-F.** Capillitial threads showing cogs, half-rings, spines and the bulbous spiny tips. **G-H.** Spores. Bar: A-D=20 µm; E=50 µm; F-H=10 µm.

dwb 3481, (mc, pH 7.6), dwb 3479. ARG-11-58: *Mulinum spinosum* twigs (mc, pH 7), dwb 3526.

* ***Badhamia nitens*** Berk.
ARG-10-42: *Mulinum spinosum* twigs, Lado 21297 (MA-Fungi 83433). ARG-11-59: *Senecio* sp. twigs, Lado 21512 (MA-Fungi 83558).

Reported previously in South America from Bolivia, Brazil and Chile (Lado & al., 2013).

* ***Badhamia utricularis*** (Bull.) Berk.
ARG-11-07: *Junellia tridens* bark (mc, pH 5.2), dwb 3509.

Calomyxa metallica (Berk.) Nieuwl.
ARG-09-19: *Araucaria araucana* log, Lado 20391 (MA-Fungi 82936), 20394 (MA-Fungi 82938), 20395 (MA-Fungi 82940), 20397 (MA-Fungi 82941), 20398 (MA-Fungi 82942). ARG-09-34: *Montea aphylla* bark (mc, pH 6.90), egc296 (MA-Fungi 83753). ARG-10-29: *Nothofagus pumilio* wood, Lado 21177 (MA-Fungi 86498).

The Patagonian material of this species had sporocarps that were solitary or in small groups, sessile and subglobose to slightly pulvinate. They had the typical iridescence in the peridium (Fig. 3B). The spores were spinulose by LM, and clearly baculate by SEM (Fig. 5A). Sporocarps of collection Lado 21177 had slightly larger spores (12-14 µm diam) than normal for this species (9-12 µm diam).

Ceratiomyxa fruticulosa (O. F. Müll.) T. Macbr.
ARG-09-56: *Nothofagus dombeyii* wood, Lado 20439 (MA-Fungi 82976). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20478 (MA-Fungi 83009), 20504 (MA-Fungi 83033), 20506 (MA-Fungi 83035). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21039 (MA-Fungi 83245). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21065 (MA-Fungi 86499), 21077 (MA-Fungi 83272). ARG-10-34: *Austrocedrus chilensis* wood, Lado 21248 (MA-Fungi 83394). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21262 (MA-Fungi 83403), 21265 (MA-Fungi 83406). ARG-11-02: *Nothofagus antarctica* wood, Lado 21348 (MA-Fungi 83453). ARG-11-11: *Nothofagus pumilio* wood, Lado 21370 (MA-Fungi 83468).

* ***Collaria nigricapillitia*** (Nann.-Bremek. & Bozonnet) Lado
ARG-10-26: *Nothofagus pumilio* wood, Lado 21122 (MA-Fungi 83290).

The somewhat weathered specimen of this lignicolous species, usually linked to the areas where the winter snow has accumulated, supposes the first time the species has been recorded for Argentina. In South America it has been previously reported from the Chilean Andes on the same substrate (Lado & al., 2013).

Comatricha laxa Rostaf.
ARG-09-09: *Nothofagus* sp. wood, Lado 20308 (MA-Fungi 82931). ARG-09-22: *Atriplex lampa* bark (mc, pH 6.75), egc16b (MA-Fungi 83574). ARG-09-23: *Atriplex lampa* bark (mc, pH 6.07),

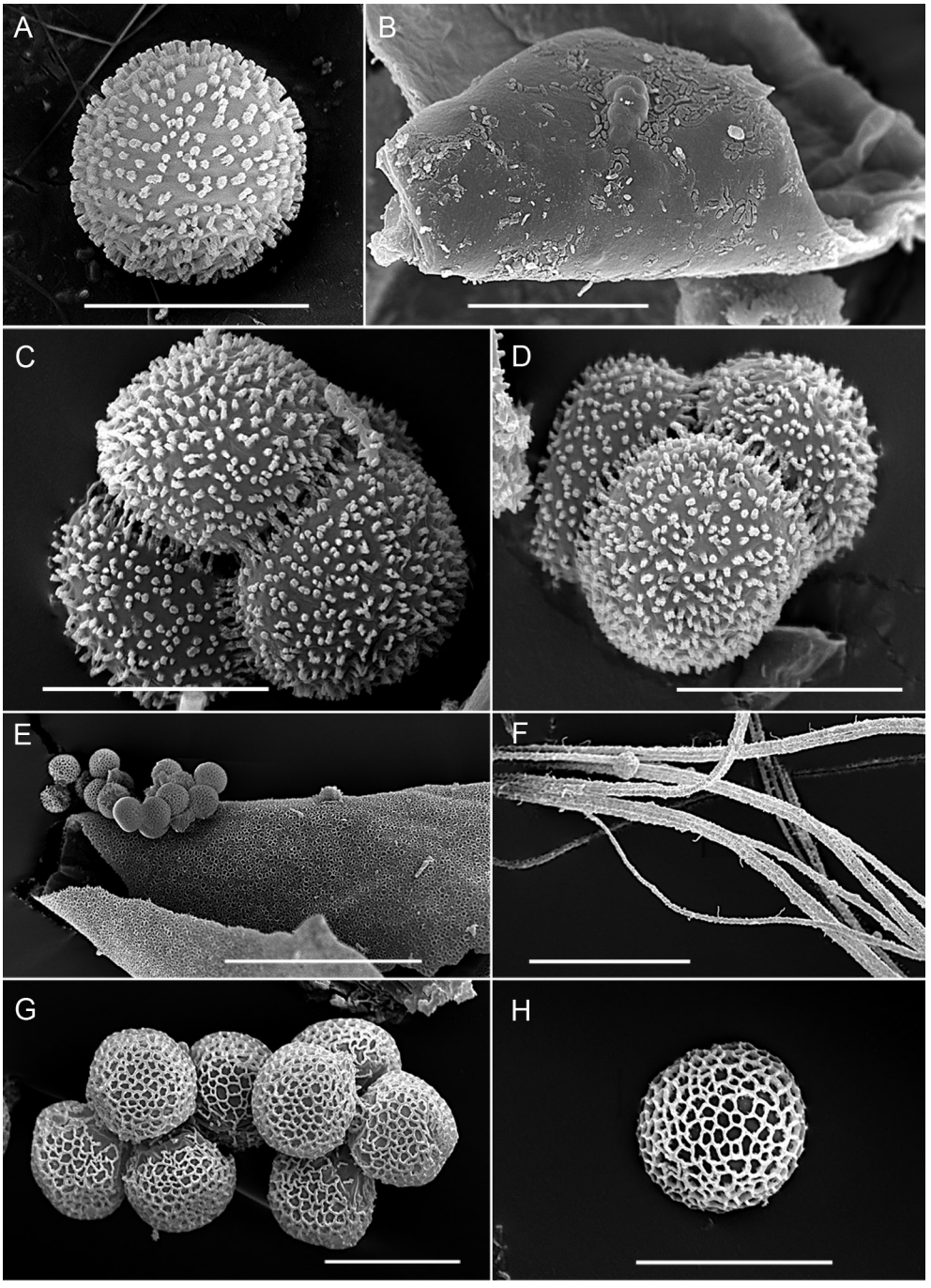

Fig. 5. A. *Calomyxa metallica* (Lado 21777). Spore by SEM. **B-D.** *Dianema corticatum* (Lado 20537) by SEM. **B.** Double peridium roll back. **C-D.** Clusters of spores. **E-H.** *Dianema depressum* (Lado 21450) by SEM. **E.** Inner surface of the peridium. **F.** Capillitium of bundled threads. **G-H.** Spores. Bar: A, C-D, G-H=10 µm; B, F=20 µm; E=50 µm.

egc151 (MA-Fungi 83683). ARG-09-25: *Ephedra ochreata* bark (mc, pH 6.81), egc17 (MA-Fungi 83575). ARG-09-26: *Schinus johnstonii* bark (mc, pH 6.52), egc18 (MA-Fungi 83576). ARG-09-27: *Schinus johnstonii* bark (mc, pH 7.09), egc19b (MA-Fungi 83578). ARG-09-29: *Larrea nitida* bark (mc, pH 6.80), egc20 (MA-Fungi 83579). ARG-09-34: *Montea aphylla* bark (mc, pH 6.90), egc22b (MA-Fungi 83581); *Schinus johnstonii* bark (mc, pH 6.66), egc23 (MA-Fungi 83582); *Larrea nitida* bark (mc, pH 6.94), egc24 (MA-Fungi 83583). ARG-09-36: *Schinus johnstonii* bark (mc, pH 6.79), egc26 (MA-Fungi 83584). ARG-09-44: *Chuquiraga avellanedae* twigs (mc, pH 5.17), egc27 (MA-Fungi 83586); *Schinus johnstonii* bark (mc, pH 6.50), egc216 (MA-Fungi 83738). ARG-09-48: *Schinus johnstonii* bark (mc, pH 6.50), egc29 (MA-Fungi 83588). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20515 (MA-Fungi 83043). ARG-09-61: wood, Lado 20640 (MA-Fungi 86500). ARG-10-31: *Nothofagus pumilio* wood, Lado 21196 (MA-Fungi 83354), 21204 (MA-Fungi 83361).

Comatricha nigra (Pers. ex J. F. Gmel.) J. Schröt.

ARG-09-06: *Araucaria araucana* bark, Lado 20279 (MA-Fungi 82907), (mc, pH 4.61), egc30 (MA-Fungi 83589). ARG-09-07: *Araucaria araucana* log, Lado 20289 (MA-Fungi 82915).

ARG-09-19: *Araucaria araucana* log, Lado 20396 (MA-Fungi 86501). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20433 (MA-Fungi 82970). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20450 (MA-Fungi 82987), 20451 (MA-Fungi 82988). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20488 (MA-Fungi 83019). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20514 (MA-Fungi 83042). ARG-09-61: *Astrocedrus chilensis* wood, Lado 20601 (MA-Fungi 83128). ARG-10-26: *Nothofagus pumilio* wood, Lado 21140 (MA-Fungi 83304), 21151 (MA-Fungi 83315). ARG-10-30: *Nothofagus pumilio* wood, Lado 21180 (MA-Fungi 83341). ARG-10-34: wood, Lado 21235 (MA-Fungi 83384), 21236 (MA-Fungi 83385), 21237 (MA-Fungi 83386), 21250 (MA-Fungi 86502). ARG-11-02: *Nothofagus antarctica* wood, Lado 21337 (MA-Fungi 86503), Lado 21340 (MA-Fungi 86504). ARG-11-04: *Nothofagus pumilio* wood, Lado 21355 (MA-Fungi 83456).

Cribraria argillacea (Pers. ex J. F. Gmel.) Pers.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21129 (MA-Fungi 83294), 21130 (MA-Fungi 83295), 21146 (MA-Fungi 83310), 21152 (MA-Fungi 83316).

Cribraria cancellata (Batsch) Nann.-Bremek.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21131 (MA-Fungi 83296). ARG-10-27: *Nothofagus pumilio* wood, Lado 21172 (MA-Fungi 83334). ARG-11-12: *Nothofagus pumilio* wood, Lado 21380 (MA-Fungi 83478).

Two collections, Lado 21172 and 21380, are of the variety *fusca* (Lister) Nann.-Bremek., also reported from Chile on *Araucaria* sp. wood (Lado & al., 2013).

[*] ***Cribraria confusa*** Nann.-Bremek. & Y. Yamam.
ARG-09-68: *Nothofagus dombeyii* wood, Lado 21028 (MA-Fungi 83237).

[*] ***Cribraria macrocarpa*** Schrad.
ARG-09-69: *Nothofagus dombeyii* wood, Lado 21069 (MA-Fungi 83267).

[*] ***Cribraria splendens*** (Roth) Rostaf.
ARG-09-68: *Nothofagus dombeyii* wood, Lado 21026 (MA-Fungi 83236). ARG-11-02: *Nothofagus antarctica* wood, Lado 21342 (MA-Fungi 83447), 21343 (MA-Fungi 83448).

Cribraria tenella Schrad.
ARG-11-13: *Nothofagus pumilio* wood, Lado 21388 (MA-Fungi), 21389 (MA-Fungi 83487).

Cribraria violacea Rex
ARG-09-05: *Eryngium paniculatum* leaves, Lado 20273 (MA-Fungi 86505). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20574 (MA-Fungi 83100), 20577 (MA-Fungi 83104).

Dianema corticatum Lister
ARG-09-56: *Nothofagus dombeyii* wood, Lado 20441 (MA-Fungi 86506). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20466 (MA-Fungi 86507). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20537 (MA-Fungi 86508).

The peridium appears single, but is clearly double and rolls backwards on itself as can be seen in Fig. 5B (SEM). The specimen Lado 20537 has the typical spores in clusters but, in some groups, the spores remain attached by the spinules (Figs. 5C-5D), possibly due to an incomplete development of the clusters.

[*] ***Dianema depressum*** (Lister) Lister
ARG-09-19: *Araucaria araucana* log, Lado 20395 (MA-Fungi 82939). ARG-11-49: *Nothofaugus pumilio* wood, Lado 21450 (MA-Fungi 86509).

In these collections the inner surface of the peridium was densely reticulate, with small diameter meshes of the reticulum by SEM (Fig. 5E). The capillitium had bundled threads which are ornamented with a faint reticulum (Fig. 5F). The spores agree with the description provided by Rammeloo (1983) for this species, with a small-meshed reticulum of about 11-13 meshes on the diameter (Figs. 5G-5H), but in this material the muri are all perforated below (Fig. 5H). This species has only been cited in South America once before from Valparaiso, central Chile (Lado & al., 2013) on a very different substrate, the palm *Jubaea chilensis.*

[†] ***Dianema mongolicum*** Novozh.
ARG-09-34: *Lyceum ameghinoi* bark (mc, pH 6.97), egc303 (MA-Fungi 83758).

This species is cited for the first time in America. It was only previously known from the Mongolian steppe, a similar environment. The material was compared to the original and the characters are the same (Novozhilov & Golubeva, 1986).

Diderma antarcticum (Speg.) Sturgis
ARG-10-27: *Nothofagus pumilio* wood, Lado 21176 (MA-Fungi 83338). ARG-11-13: *Nothofagus pumilio* wood, Lado 21382 (MA-Fungi 83480).

The sporocarps were densely aggregate, slightly polygonal by mutual pressure. The outer peridium layer was dark brown and the inner layer pale yellow, and a thick, white, calcareous layer lies between them (Fig. 3D), as is characteristic of this species. This rare species was originally described from Chile by Spegazzini in 1887, and the only other record appeared to be from Tierra del Fuego (Arambarri, 1975) until it was collected on the same substrate as these in Rio Negro (Wrigley de Basanta & al., 2010b).

Diderma fragile Aramb.
ARG-09-03: *Astrocedrus chilensis* wood, Lado 20227 (MA-Fungi 86512); leaves Lado 20233 (MA-Fungi 86510), 20237 (MA-Fungi 86511). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20508 (MA-Fungi 83036). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20585 (MA-Fungi 83114). ARG-10-18: *Nothofagus pumilio* log, Lado 21102 (MA-Fungi 86513).

Diderma gracile Aramb.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21125 (MA-Fungi), 21144 (MA-Fungi 83308). ARG-10-27: *Nothofagus pumilio* wood, Lado 21158 (MA-Fungi 83323), 21171 (MA-Fungi 83333). ARG-10-30: *Nothofagus pumilio* wood, Lado 21181 (MA-Fungi 83342). ARG-11-02: *Nothofagus antarctica* wood, Lado 21345 (MA-Fungi 83450).

A revised and extended description of this species was given in Wrigley de Basanta & al. (2010b). In that paper it was reported from four Argentinian provinces for the first time, since its description from Tierra del Fuego by Arambarri (1973). These collections confirm its presence in Chubut and Santa Cruz.

Diderma robustum Aramb.
ARG-11-02: *Nothofagus antarctica* wood, Lado 21344 (MA-Fungi 83449), 21348 (MA-Fungi 83452). ARG-11-04: *Nothofagus pumilio* wood, Lado 21351 (MA-Fungi 83454). ARG-11-12: *Nothofagus pumilio* wood, Lado 21378 (MA-Fungi 83476).

This very distinctive species was collected in Argentina from the provinces of Chubut and Rio Negro (Wrigley de Basanta & al., 2010b) for the first time since its description from Tierra del Fuego (Arambarri, 1973). These collections extend the presence of *Diderma robustum,* a species that appears to be associated with southern beech forests between latitudes 41° to 55°S, to a new province, Santa Cruz.

Diderma spumarioides (Fr.) Fr.
ARG-09-02: leaf of *Eryngium paniculatum*, Lado 20223 (MA-Fungi 86514).

Didymium anellus Morgan
ARG-09-09: *Nothofagus* sp. leaves, Lado 20303 (MA-Fungi 82927). ARG-09-13: *Ephedra ochreata* bark (mc, pH 7.29), egc121 (MA-Fungi 83661). ARG-09-33: *Larrea* spp. leaf litter and *Junellia* sp. twigs (mc, pH 6.94), egc123 (MA-Fungi 83663). ARG-10-40: *Lycium ameghinoi* (mc, pH 6.6), dwb 3477. ARG-11-28: *Senecio* sp. twigs, Lado 21421 (MA-Fungi 86515). ARG-11-40: *Senecio* sp. twigs, Lado 21442 (MA-Fungi 83512).

The spores of specimens dwb 3450 and egc121 from moist chamber culture are pale, warted with groups of warts and measure 9-11 µm diam.

†***Didymium annulisporum*** Keller & Schoknecht
ARG-10-01: *Lycium ameghinoi* dead twigs (mc, pH 5.6), dwb 3447. ARG-10-02: *Prosopis denudans* bark (mc, pH 6.72), egc120 (MA-Fungi 83660).

This large collection was formed all over the twigs in moist chamber culture. Dead twigs are a new substrate for this myxomycete that was described from Colorado USA on cow dung. However the spores have the characteristic ring around them that gives the species its name (Fig. 6B), and the small sporocarps (0.1-0.4 mm diam.) and short plasmodiocarps, the eggshell-type peridial lime made up of cup-like crystals by SEM (Fig. 6A) and the capillitium containing crystalline lime all match the description by Keller & Schoknecht (1989).

*†***Didymium chilense*** Estrada, Lado & D. Wrigley
ARG-09-03: leaf litter, Lado 20234 (MA-Fungi 82879). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21080 (MA-Fungi 83275).

This is the first record of this species from Argentina. It was recently described from central Chile on the leaves of sclerophyll trees (Lado & al., 2013).

Didymium clavus (Alb. & Schwein.) Rabenh.
ARG-09-03: leaf litter, Lado 20236 (MA-Fungi 82881), 20238 (MA-Fungi 82882).

Didymium difforme (Pers.) Gray
ARG-10-21: *Senecio filaginoides* bark (mc, pH 6.57), egc109 (MA-Fungi 83652). ARG-10-39: *Mulinum spinosum* twigs, (mc, pH 6.60), egc304 (MA-Fungi 83757); *Schinus johnstonii* bark (mc, pH 6.28), egc110 (MA-Fungi 83653); *Festuca* spp. blades (mc, pH 6.61), egc111 (MA-Fungi 83654). ARG-10-40: *Schinus johnstonii* bark (mc, pH 6.62), egc112 (MA-Fungi 83655). ARG-10-43: *Senecio filaginoides* bark (mc, pH 7.64), egc113 (MA-Fungi 83656). ARG-11-08: *Senecio* sp. (ground litter) (mc, pH 6.60), egc298 (MA-Fungi 83755).

Didymium dubium Rostaf.
ARG-09-13: *Senecio filaginoides* bark (mc, pH 6.88), egc127 (MA-Fungi 83664). ARG-09-23: *Atriplex lampa* bark (mc, pH 6.07), egc122 (MA-Fungi 83662). ARG-09-27: *Ephedra ochreata* twigs (mc, pH 5.3), dwb 3456. ARG-09-28: *Prosopis* spp. leaf litter (mc, pH 7.38), egc130 (MA-Fungi 83666). ARG-09-29: *Atriplex lampa* leaf litter (mc, pH 6.38), egc132 (MA-Fungi 83667). ARG-09-34: herbivore dung (mc, pH 6.55), egc134 (MA-Fungi 83668); *Larrea nitida* twigs (mc, pH 5.44), egc135 (MA-Fungi 83669). ARG-09-36: *Chuquiraga avellanedae* leaf litter (mc, pH 6.78), egc136 (MA-Fungi 83670). ARG-09-42: *Chuquiraga avellanedae* leaf litter (mc, pH 6.32), egc137 (MA-Fungi 83671). ARG-09-43: *Atriplex lampa* leaf litter (mc, pH 6.77), egc140 (MA-Fungi 83673) ARG-09-44: *Chuquiraga avellanedae* leaf litter (mc, pH 6.13), egc141 (MA-Fungi 83674). ARG-09-48: *Nassauvia glomerulosa* bark (mc, pH 6.84), egc142 (MA-Fungi 83675); sheep droppings (mc, pH 6,49), egc221 (MA-Fungi 83742). ARG-09-54: *Schinus johnstonii* bark (mc, pH 6.63), egc143 (MA-Fungi 83676). ARG-09-65: *Senecio filaginoides* bark (mc, pH 6.53), egc144 (MA-Fungi 83677). ARG-10-01: *Chuquiraga avellanedae* leaf litter (mc, pH 6.17), egc145 (MA-Fungi 83678). ARG-10-08: Verbenaceae bark (mc, pH 7.07), egc146 (MA-Fungi 83679). ARG-10-19: *Mulinum spinosum* twigs (mc, pH 7.16), egc147 (MA-Fungi 83680). ARG-11-28: *Senecio* sp. twigs, Lado 21411 (MA-Fungi 86516).

†***Didymium leptotrichum*** (Racib.) Massee
ARG-09-21: *Maihuenia poeppigii* remains (mc, pH 7.5), dwb 3399. ARG-09-31: *Ephedra ochreata* twigs (mc, pH 5.1), dwb 3461. ARG-09-51: *Maihuenia patagonica* remains (mc, pH 5.9),

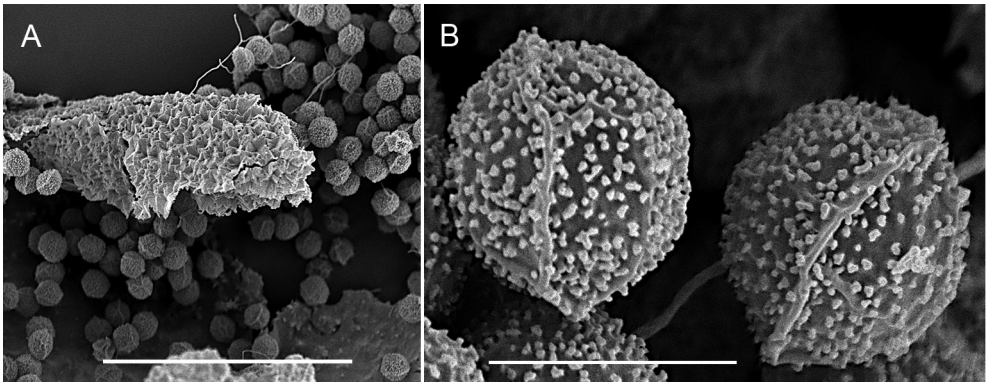

Fig. 6. *Didymium annulisporum* (dwb 3447) by SEM. **A.** Peridium with cup-like crystals. **B.** Spores. Bar: A=100 µm; B=10 µm.

dwb 3395. ARG-09-53: *Ephedra ochreata* twigs (mc, pH 6.7), dwb 3418. ARG-09-54: *Acaena splendens* twigs, Lado 20412 (MA-Fungi 86517). ARG-09-66: *Grindellia chiloensis* twigs, Lado 20963 (MA-Fungi 83181). ARG-11-59: *Senecio* sp. twigs, Lado 21514 (MA-Fungi 86518). ARG-11-07: *Junellia tridens* bark (mc, pH 5.3), dwb 3506.

The spores of the collections from moist chamber culture are paler than those from the field collections, but otherwise the characteristics are the same.

Didymium nigripes (Link) Fr.
ARG-09-61: leaves, Lado 20635 (MA-Fungi 86519). ARG-09-67: *Nothofagus* sp. wood, Lado 20990 (MA-Fungi 83205), 21002 (MA-Fungi 83216). ARG-09-68: *Nothofagus dombeyii* leaves, Lado 21023 (MA-Fungi 83234). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21058 (MA-Fungi 83258), 21073 (MA-Fungi 83269), 21078 (MA-Fungi 83273); leaves, Lado 21075 (MA-Fungi 83270).

°***Didymium orthonemata*** H.W. Keller & T.E. Brooks
ARG-09-49: *Ephedra ochreata* twigs (mc, pH 6.4), dwb 3453.

This small collection has flattened sporocarps with dark spores 12-14 µm diam with irregularly dispersed spines. In the Neotropics it has been previously reported from Mexico (Estrada-Torres & al., 2009).

Didymium quitense (Pat.) Torrend
ARG-09-43: *Chuquiraga avellanedae* leaf litter (mc, pH 6.78), egc139 (MA-Fungi 83672).

Although the collection is scarce, the closely packed sporocarps show most of the main characters such as an egg-shell like peridium and spores 12.8-13.6 µm diam, dark, strongly warted and with some warts united.

Didymium squamulosum (Alb. & Schwein.) Fr.
ARG-09-02: *Eryngium paniculatum* leaf, Lado 20216 (MA-Fungi 82871). ARG-09-03: leaves, Lado 20231 (MA-Fungi 82878), 20243 (MA-Fungi 82884), 20255 (MA-Fungi 82895), 20256 (MA-Fungi 82896); leaves and twigs, Lado 20242 (MA-Fungi 82883); twigs, Lado 20246 (MA-Fungi 82887); *Astrocedrus chilensis* bark, Lado 20248 (MA-Fungi 82889), 20249 (MA-Fungi 82890). ARG-09-05: *Eryngium paniculatum* leaves, Lado 20263 (MA-Fungi 86520), 20265 (MA-Fungi 82897), 20266 (MA-Fungi 82898), 20271 (MA-Fungi 82902), 20272 (MA-Fungi 82903), 20275 (MA-Fungi 82904). ARG-09-08: *Eryngium paniculatum* leaves, Lado 20290 (MA-Fungi 82916). ARG-09-09: *Nothofagus* sp. wood, Lado 20292 (MA-Fungi 82918), 20295 (MA-Fungi 82920), 20296 (MA-Fungi 82921), 20297 (MA-Fungi 82922), 20298 (MA-Fungi 82923), 20302 (MA-Fungi 82926), 20304 (MA-Fungi 82928); *Nothofagus* sp. leaves, Lado 20299 (MA-Fungi 82924), 20300 (MA-Fungi 82925), 20305 (MA-Fungi 82929), 20306 (MA-Fungi 82930), 20313 (MA-Fungi 82935). ARG-09-31: *Prosopidastrum globosum* bark (mc, pH 6.55), egc114 (MA-Fungi 83657). ARG-09-45: bark (mc, pH 7.01), egc115 (MA-Fungi 83658).

Samples Lado 20271, 20272, 20275, and 20290 have carbonate in funnel-shaped flakes on the peridium the same as that noticed in specimens from Chile (Lado & al., 2013).

°***Didymium sturgisii*** Hagelst.
ARG-09-22: *Atriplex lampa* bark (mc, pH 6.75), egc219 (MA-Fungi 83741).

The sporocarps show a characteristic membranous peridium, sprinkled with white and stellate lime crystals. A thickened base gives rise to erect pillars with some enclosed white lime crystals, attached to the upper peridium. Spores of 11.2-12.8 µm diam., minutely warted and without clusters of warts. In the Neotropics it has been previously reported from Mexico and Costa Rica.

°***Didymium trachysporum*** G. Lister
ARG-09-49: *Ephedra ochreata* twigs (mc, pH 5.6), dwb 3450.

The sporocarps and short plasmodiocarps with a double peridium, the outer layer covered with densely packed lime crystals, and the pronounced, dispersed warts on the spores that measure 10-12 µm suggest this species. The spores are paler. In the Neotropics it has been previously reported from Mexico.

Didymium vaccinum (Durieu & Mont.) Rostaf.
ARG-09-05: *Eryngium paniculatum* leaves, Lado 20273 (MA-Fungi 86521). ARG-09-23: *Larrea cuneifolia* twigs (mc, pH 4.64), egc104 (MA-Fungi 83648). ARG-09-37: *Agave* sp. leaves, Lado 20406 (MA-Fungi 86522). ARG-09-49: sheep droppings (mc, pH 6.76), egc105 (MA-Fungi 83649). ARG-09-65: *Mulinum spinosum* twigs (mc, pH 6.94), egc107 (MA-Fungi 83650). ARG-10-41: *Schinus johnstonii* bark (mc, pH 6.72), egc108 (MA-Fungi 83651). ARG-11-07: *Junellia tridens* bark (mc, pH 5.3), dwb 3505. ARG-11-24: *Senecio* sp. leaf litter (mc, pH 6.66), egc300 (MA-Fungi 83756).

*°***Echinostelium apitectum*** K.D. Whitney
ARG-11-40: *Senecio* sp. twigs (mc, pH 6,3), dwb 3488.

Echinostelium brooksii K.D. Whitney
ARG-09-27: *Ephedra ochreata* twigs (mc, pH 5,3), dwb 3439. ARG-09-43: *Larrea divaricata* twigs (mc, pH 4.82), egc45 (MA-Fungi 83599). ARG-09-51: *Colliguaja integerrima* twigs (mc, pH 4.68), egc46 (MA-Fungi 83600). ARG-10-10: *Colliguaja integerrima* bark (mc, pH 5.14), egc47 (MA-Fungi 83601); *Schinus johnstonii* bark (mc, pH 5.53), egc48 (MA-Fungi 83602).

°***Echinostelium coelocephalum*** T.E. Brooks & H.W. Keller
ARG-09-13: *Ephedra* sp. twigs (mc, pH 5.3), dwb 3292. ARG-09-24: *Ephedra ochreata* bark (mc, pH 7.38), egc35 (MA-Fungi 83591). ARG-09-28: *Lycium chilense* bark (mc, pH 7.38), egc36 (MA-Fungi 83592). ARG-09-31: *Ephedra ochreata* twigs (mc, pH 5.1), dwb 3436; (mc, pH 5.6), dwb 3441; (mc, pH 5.7), dwb 3443. ARG-09-46: *Lyceum ameghinoi* bark (mc, pH 6), dwb 3283; (mc, pH 6.1), dwb 3286. ARG-09-51: *Nassauvia glomerulosa* bark (mc, pH 6.85), egc37 (MA-Fungi 83593). ARG-09-66: *Senecio filaginoides* bark (mc, pH 7.21), egc39 (MA-Fungi 83594). ARG-09-66: *Mulinum spinosum* twigs (mc, pH 7.08), egc40 (MA-Fungi 83595). ARG-10-41: *Schinus johnstonii* bark (mc, pH 6.69-6.75), egc44 (MA-Fungi 83598). ARG-11-14: *Schinus johnstonii* bark (mc, pH 4.9), dwb 3517; (mc, pH 6.8), dwb 3518. ARG-11-15: *Junellia tridens* twigs (mc, pH 6.3), dwb 3490. ARG-11-20: *Senecio* sp. bark (mc, pH 7), dwb 3514; (mc, pH 6.6), dwb 3515; (mc, pH 6.9), dwb 3516. ARG-11-29: *Lycium chilense* bark (mc, pH 6.5), dwb 3494; (mc, pH 6.5), dwb 3495. ARG-11-31: *Lepidophyllum cupressiforme* bark (mc, pH 6.5), dwb 3493; (mc, pH 6.5), dwb 3492.

These collections show the very prominent articular surfaces with truncate margins on the spores (Whitney, 1980) and were all less than 70 µm in total height. These characters distinguish the species from *E. colliculosum*. In the Neotropics it has been previously reported from Belize.

Echinostelium colliculosum K.D. Whitney & H.W. Keller
ARG-09-12: *Chuquirraga aurea* litter (mc, pH 6.4), dwb 3321, dwb 3322; (mc, pH 6.5), dwb 3323. ARG-09-23: *Atriplex lampa* litter (mc, pH 6.2), dwb 3295. ARG-09-31: *Ephedra* sp. wood (mc, pH 6.48), ET-12174. ARG-09-46: *Lycium ameghinoi* wood (mc, pH 6.68), ET-12181. ARG-10-08: *Ephedra frustillata* wood (mc, pH 6.79), ET-12176; (mc, pH 6.66), ET-12179 ARG-10-09: *Junellia tridens* bark (mc, pH 6.31), egc41 (MA-Fungi 83596); *Schinus johnstonii* bark (mc, pH 6.17), egc42 (MA-Fungi 83597). ARG-10-39: *Azorella monantha* leaves (mc, pH 8.06), ET-12190. ARG-11-15: *Junellia tridens* twigs (mc, pH 6.1), dwb 3500; (mc, pH 6.3), dwb 3489. ARG-11-19: *Junellia tridens* litter (mc, pH 5.6), dwb 3496.

Echinostelium minutum de Bary
ARG-09-31: *Mulinum spinosum* twigs (mc, pH 6.58), egc49 (MA-Fungi 83603); *Ephedra ochreata* twigs (mc, pH 5.7), dwb 3438. ARG-09-42: *Chuquiraga avellanedae* twigs (mc pH 6.34), egc50 (MA-Fungi 83604); *Mulinum spinosum* twigs (mc, pH 6.28), egc51 (MA-Fungi 83605). ARG-09-46: *Lyceum ameghinoi* bark (mc, pH 6.1), dwb 3287. ARG-10-33: *Fitzroya cupressoides* bark (mc, pH 3.9), dwb 3445. ARG-11-38: *Lepidophyllum cupressiforme* bark (mc, pH 6.2), dwb 3520, dwb 3523. ARG-11-40: *Senecio* sp. twigs (mc, pH 6.3), dwb 3487.

Enerthenema papillatum (Pers.) Rostaf.
ARG-09-09: *Nothofagus* sp. wood, Lado 20309 (MA-Fungi 82932). ARG-09-43: *Atriplex lampa* bark (mc, pH 5.81), egc34 (MA-Fungi 83590). ARG-10-33: wood, Lado 21228 (MA-Fungi 83380).

Fuligo cinerea (Schwein.) Morgan
ARG-09-44: *Lycium ameghinoi* bark (mc, pH 7), dwb 3429. ARG-09-65: *Senecio filaginoides* bark (mc, pH 6.53), egc210 (MA-Fungi 83734).

Fuligo septica (L.) F.H. Wigg.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21120 (MA-Fungi 83288).

This collection is the variety *flava* (Pers.) Lázaro.

Hemitrichia minor G. Lister
ARG-09-64: *Mullinum spinosum* twigs, Lado 20941 (MA-Fungi 86523), 20945 (MA-Fungi 83166), 20946 (MA-Fungi 83167); *Nausauvia glomerulosa* twigs, Lado 20943 (MA-Fungi 86524); rama de *Senecio* sp., Lado 20949 (MA-Fungi 83168). ARG-09-65: *Nausauvia glomerulosa* twigs, Lado 20955 (MA-Fungi 83174); 20956 (MA-Fungi 83175). ARG-11-30: *Senecio* sp. twigs, Lado 21430 (MA-Fungi 86525).

* ***Hemitrichia pardina*** (Minakata) Ing
ARG-09-02: *Eryngium paniculatum* leaf, Lado 20221 (MA-Fungi 82874).

* ***Lamproderma scintillans*** (Berk. & Broome) Morgan
ARG-09-02: *Eryngium paniculatum* leaf, Lado 20220 (MA-Fungi 88526).

Leocarpus fragilis (Dicks.) Rostaf.
ARG-09-61: wood, Lado 20643 (MA-Fungi 83160). ARG-10-26: *Nothofagus pumilio* wood, Lado 21147 (MA-Fungi 83311), 21148 (MA-Fungi 83312). ARG-10-27: *Nothofagus pumilio* wood, Lado 21169 (MA-Fungi 83331), 21174 (MA-Fungi 83336). ARG-11-11: *Nothofagus pumilio* wood, Lado 21359 (MA-Fungi 83458), 21364 (MA-Fungi 83463).

Lepidoderma peyerimhoffii Maire & Pinoy
ARG-09-61: *Nothofagus dombeyii* wood, Lado 20556 (MA-Fungi 83085).

In South America, only previously known from Santa Cruz province, Argentina (Wrigley de Basanta & al., 2010b).

Lepidoderma trevelyanii (Grev.) Poulain & Mar.Mey.
ARG-09-61: *Nothofagus dombeyii* wood, Lado 20556 (MA-Fungi 83084); Populus sp. leaves, Lado 20610 (MA-Fungi 83135) 20618 (MA-Fungi 83140). ARG-10-27: *Nothofagus pumilio* wood, Lado 21170 (MA-Fungi 83332). ARG-11-13: *Nothofagus pumilio* wood, Lado 21386 (MA-Fungi 83484), 21387 (MA-Fungi 83485), 21390 (MA-Fungi 83488), 21392 (MA-Fungi 83490). ARG-11-17: *Nothofagus pumilio* wood, Lado 21403 (MA-Fungi 83497), 21406 (MA-Fungi 83499). ARG-11-50: *Nothofagus pumilio* wood, Lado 21452 (MA-Fungi 83514), 21453 (MA-Fungi 83515), 21456 (MA-Fungi 83518), 21458 (MA-Fungi 83520), 21459 (MA-Fungi 83521), 21460 (MA-Fungi 83522) 21461 (MA-Fungi 83523), 21462 (MA-Fungi 83524), 21463 (MA-Fungi 83525), 21464 (MA-Fungi 83526), 21465 (MA-Fungi 83527), 21466 (MA-Fungi 83528). ARG-11-51: *Nothofagus pumilio* wood, Lado 21468 (MA-Fungi 83530), 21470 (MA-Fungi 83531) 21471 (MA-Fungi 83532), 21473 (MA-Fungi 83533), 21474 (MA-Fungi 83534), 21475 (MA-Fungi 83535), 21476 (MA-Fungi 83536), 21478 (MA-Fungi 83538), 21479 (MA-Fungi 83539), 21480 (MA-Fungi 83540) 21481 (MA-Fungi 83541), 21482 (MA-Fungi 83542), 21483 (MA-Fungi 83543), 21484 (MA-Fungi 83544), 21485 (MA-Fungi 83545), 21487 (MA-Fungi 83546), 21488 (MA-Fungi 83547), 21489 (MA-Fungi 83548), 21490 (MA-Fungi 83549) 21491 (MA-Fungi 83550), 21492 (MA-Fungi 83551). ARG-11-52: *Nothofagus pumilio* wood, Lado 21494 (MA-Fungi 83553), 21495 (MA-Fungi 83554).

* ***Licea biforis*** Morgan
ARG-09-34: *Schinus johnstonii* bark (mc, pH 6.66), egc100 (MA-Fungi 83645).

* ***Licea deplanata*** Kowalski
ARG-09-36: *Schinus johnstonii* bark (mc, pH 6.79), egc289 (MA-Fungi 83751).

In the Neotropics it has been previously reported from Mexico (Rojas & al., 2010).

* ***Licea kleistobolus*** G.W. Martin
ARG-09-23: cow dung (mc, pH 7.30), egc97 (MA-Fungi 83642). ARG-09-28: *Suaeda divaricata* twigs (mc, pH 6.37), egc96 (MA-Fungi 83641). ARG-09-31: *Mulinum spinosum* twigs, (mc, pH 6.58), egc99 (MA-Fungi 83644). ARG-09-33: *Mulinum spinosum* twigs (mc, pH 6.95), egc98 (MA-Fungi 83643). ARG-09-36: *Schinus johnstoni* bark (mc, pH 6.8), dwb 3392. ARG-09-38: *Chuquiraga hystrix* bark (mc, pH 6.88), egc102 (MA-Fungi 83646). ARG-09-42: *Mulinum spinosum* twigs (mc, pH 6.28), egc103 (MA-Fungi 83647). ARG-09-48: *Mulinum spinosum* twigs, (mc, pH 7.25), egc218 (MA-Fungi 83740).

Licea minima Fr.
ARG-09-56: *Nothofagus dombeyii* wood, Lado 20419 (MA-Fungi 82957). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20448 (MA-Fungi 82986). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20532 (MA-Fungi 83061). ARG-09-67: *Nothofagus* sp. wood, Lado 20986 (MA-Fungi 83201).

° ***Licea nannengae*** Pando & Lado
ARG-09-27: *Ephedra ochreata* twigs (mc, pH 6), dwb 3457.

This specimen is the first record for South America. In the Neotropics it has been previously reported from Mexico.

Licea succulenticola Mosquera, Lado, Estrada & Beltrán-Tej.
ARG-09-11: *Maihuenia poeppigii* remains (mc, pH 7.1), dwb 3342.

This large collection of typical ellipsoid sporocarps of this small myxomycete was isolated from moist chamber culture of cactus remains. Reported in South America from Chile and Ecuador (Lado & Wrigley de Basanta, 2008; Lado & al., 2013).

Lycogala epidendrum (L.) Fr.
ARG-09-20: *Populus* sp. log, Lado 20404 (MA-Fungi 82948). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20460 (MA-Fungi 82996). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20579 (MA-Fungi 83107), 20587 (MA-Fungi 83116), 20588 (MA-Fungi 83117), 20598 (MA-Fungi 83125). ARG-09-67: *Nothofagus* sp. wood, Lado 20972 (MA-Fungi 83188), 20979 (MA-Fungi 83194). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21076 (MA-Fungi 83271). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21278 (MA-Fungi 83417).

†***Macbrideola argentea*** Nann.-Bremek. & Y. Yamam.
ARG-09-13: *Ephedra ochreata* bark (mc, pH 7.29), egc1 (MA-Fungi 83560); *Senecio filaginoides* bark, (mc, pH 6.88), egc2 (MA-Fungi 83561). ARG-09-22: *Atriplex lampa* bark (mc,pH 6.75), egc3 (MA-Fungi 83562). ARG-09-23: *Atriplex lampa* litter (mc, pH 6.2), dwb 3296. ARG-09-26: *Schinus johnstonii* bark (mc, pH 6.52), egc5 (MA-Fungi 83563). ARG-09-27: *Ephedra ochreata* twigs (mc, pH 5.3), dwb 3435. ARG-09-28: *Atriplex* spp. twigs (mc, pH 6.80), egc6 (MA-Fungi 83564); *Psilla spartioides* twigs (mc, pH 6.93), egc7 (MA-Fungi 83565); *Lycium chilense* bark (mc, pH 7.38), egc8 (MA-Fungi 83566). ARG-09-29: *Atriplex lampa* bark (mc, pH 6.07), egc9 (MA-Fungi 83567). ARG-09-31: *Prosopidastrum globosum* bark (mc, pH 6.75), egc10 (MA-Fungi 83568). ARG-09-35: *Montea aphylla* bark (mc, pH 7.25), egc11 (MA-Fungi 83569). ARG-09-43: *Atriplex lampa* leaf litter (mc, pH 6.77), egc12 (MA-Fungi 83570); *Atriplex lampa* litter (mc, pH 5.4), dwb 3301. ARG-09-48: *Nassauvia glomerulosa* bark (mc, pH 6.84), egc13 (MA-Fungi 83571). ARG-09-55: *Mulinum spinosum* twigs (mc, pH 6.1), dwb 3391. ARG-10-03: *Lycium ameghinoi* bark (mc, pH 7.11), egc15 (MA-Fungi 83572). ARG-10-11: *Senecio filaginoides* bark (mc pH 7.2), dwb 3367. ARG-11-46: *Senecio* sp. twigs (mc pH 6.5), dwb 3485.

Most of these specimens had the typical silvery persistent peridium that gave the species its name. In a few specimens the peridium was evanescent leaving only an obvious collar (Figs. 7A-7B), but examination of material used by the authors in the original description of the species (YY 792 and YY 783), from BM herbarium, confirmed that some of those sporocarps also had an evanescent peridium. The long columella split into two or three branches merging with the capillitium (Fig. 7D), stalks were long and slender and the warted spores had groups of warts, seen to be an irregular distribution by SEM (Figs. 7C, 7E-7F). All these agree with the original description (Nannenga-Bremekamp & Yamamoto, 1983).

*[*]**Macbrideola cornea*** (G. Lister & Cran) Alexop.
ARG-09-10: *Senecio filaginoides* bark, Lado 21094 (MA-Fungi 82909).

°***Macbrideola oblonga*** Pando & Lado
ARG-09-22: *Atriplex lampa* bark (mc, pH 6.75), egc16a (MA-Fungi 83573). ARG-09-27: *Schinus johnstoni* bark (mc, pH 7.09), egc19 (MA-Fungi 83577). ARG-09-34: *Montea aphylla* bark (mc, pH 6.90), egc22a (MA-Fungi 83580). ARG-09-36: *Schinus johnstoni* bark (mc, pH 6.79), egc26b (MA-Fungi 83585). ARG-09-46: *Lycium ameginoi* bark (mc, pH 6.97), egc28 (MA-Fungi 83587).

Some sporocarps of these collections were slightly different to the typical sporocarps described by Pando & Lado (1988). The sporothecae were globose or subglobose rather than ovate or subcylindrical and the stalks were longer, up to 50% of the total height. The ornamentation of the spores was typical but the spores were smaller. In the Neotropics it has been previously reported from Mexico.

Macbrideola scintillans H.C. Gilbert
ARG-09-21: *Ephedra* sp. twigs (mc, pH 5.4), dwb 3284 ARG-09-36: *Schinus johnstonii* bark (mc, pH 6.9), dwb 3426.

Metatrichia floriformis (Schwein.) Nann.-Bremek.
ARG-09-20: *Populus* sp. log, Lado 20405 (MA-Fungi 82949). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20427 (MA-Fungi 82964), Lado 20437 (MA-Fungi 82974), 20445 (MA-Fungi 82981). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20453 (MA-Fungi 82990), 20454 (MA-Fungi 82991), 20457 (MA-Fungi 82994), 20471 (MA-Fungi 83303). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20531 (MA-Fungi 83060), 20967 (MA-Fungi 83185). ARG-09-67: *Nothofagus* sp. wood, Lado 20976 (MA-Fungi 83191), 20989 (MA-Fungi 83204), 21004 (MA-Fungi 83218), 21006 (MA-Fungi 83220), 21012 (MA-Fungi 83226). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21021 (MA-Fungi 83232). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21054 (MA-Fungi 83255), 21064 (MA-Fungi 83263), 21066 (MA-Fungi 83264). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21274 (MA-Fungi 83413). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21282 (MA-Fungi 83421), 21283 (MA-Fungi 83422), 21284 (MA-Fungi 83423). ARG-11-11: *Nothofagus pumilio* wood, Lado 21360 (MA-Fungi 83459).

†***Oligonema aurantium*** Nann.-Bremek.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21127 (MA-Fungi 86527). ARG-10-27: *Nothofagus pumilio* wood, Lado 21165 (MA-Fungi 83328). ARG-10-30: *Nothofagus pumilio* wood, Lado 21186 (MA-Fungi 83347). ARG-10-31: *Nothofagus pumilio* wood, Lado 21199 (MA-Fungi 83357).

These collections had golden sporocarps that give the species its name (Fig. 3E). They had reticulate spores (Fig. 8A) and faint spirals on the capillitial threads. In all these collections the capillitium was abundant which is not often seen in this genus. This is the first record for the Neotropics.

Oligonema schweinitzii (Berk.) G.W. Martin
ARG-09-60: *Nothofagus dombeyii* wood, Lado 20507 (MA-Fungi 86528). ARG-09-66: *Festuca payescens* blades, Lado 20961 (MA-Fungi 86529).

These collections have spores with a double reticulum, one is well-marked and prominent with a large, perforated and fragmented mesh, and in the lumen of the larger mesh are smaller, separate reticula (Fig. 8C). The capillitial threads are decorated with faint spiral bands only visible at high magnifications or by SEM (Fig. 8B).

Perichaena calongei Lado, D. Wrigley & Estrada
ARG-09-33: *Larrea* spp. leaf litter and *Junellia* twigs. (mc, pH 6.94), egc63 (MA-Fungi 83615).

Perichaena corticalis (Batsch) Rostaf.
ARG-09-61: *Nothofagus dombeyii* wood, Lado 20571 (MA-Fungi 83099); *Populus* sp. bark, Lado 20612 (MA-Fungi 86530), 20614 (MA-Fungi 83136), 20626 (MA-Fungi 86531).

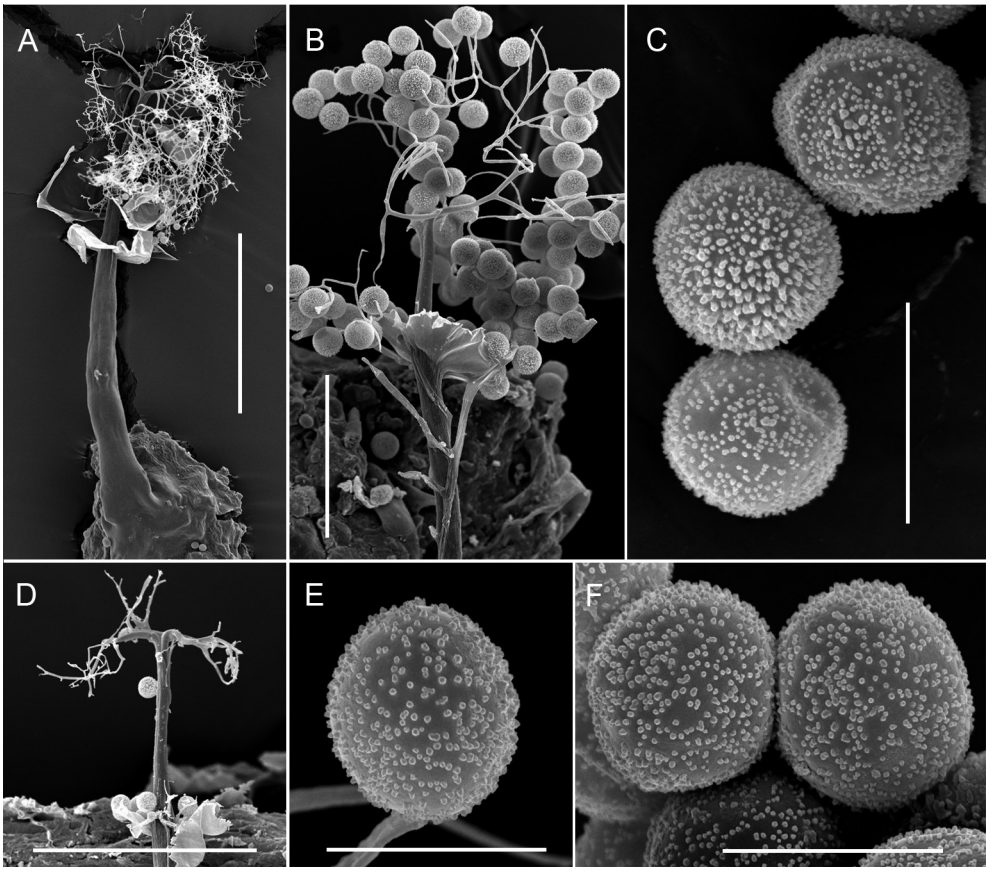

Fig. 7. *Macbrideola argentea* by SEM. **A.** Sporocarp (dwb 3435). **B.** Capillitium, spores and obvious collar (dwb 3485). **C.** Spores (dwb 3435). **D.** Columella split into two or three branches merging with the capillitium (dwb 3485). **E-F.** Spores (dwb 3485). Bar: A=200 µm; B=50 µm; C, E-F=10 µm; D=100 µm.

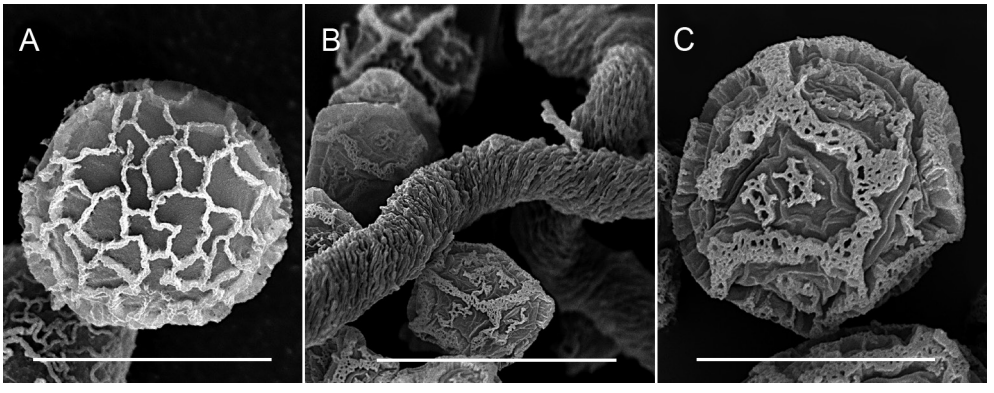

Fig. 8. A. *Oligonema aurantium* (Lado 21199). Spore by SEM. **B-C.** *Oligonema schweinitzii* (Lado 20507) by SEM. **B.** Capillitial thread and spores. **C.** Detail of spore ornamentation. Bar: A, C=10 µm; B=20 µm**.**

Perichaena depressa Lib.

ARG-09-10: herbivore dung (mc, pH 7.20), egc64 (MA-Fungi 83616). ARG-09-23: *Larrea cuneifolia* twigs (mc, pH 4.64), egc65 (MA-Fungi 83617). ARG-09-25: *Ephedra ochreata* bark (mc, pH 6.81), egc67 (MA-Fungi 83618). ARG-09-32: *Ephedra ochreata* bark (mc, pH 6.74), egc68 (MA-Fungi 83619). ARG-09-35: *Montea aphylla* bark (mc, pH 7.25), egc69 (MA-Fungi 83620). ARG-09-44: *Prosopidastrum globosum* bark (mc, pH 6.85), egc71 (MA-Fungi 83622). ARG-09-52: *Mulinum spinosum* twigs (mc, pH 5.96), egc72 (MA-Fungi 83623); sheep droppings (mc pH 7.69), egc86 (MA-Fungi 83635). ARG-09-64: *Mulinum spinosum* twigs, (mc, pH 6.51), egc73 (MA-Fungi 83624). ARG-10-12: herbivore dung (mc, pH 7.05), egc74 (MA-Fungi 83625); *Senecio filaginoides* bark (mc, pH 6.41), egc75 (MA-Fungi 83626). ARG-10-38: *Senecio filaginoides* bark (mc, pH 7.02), egc76 (MA-Fungi 83627). ARG-10-43: *Senecio filaginoides* bark (mc, pH 7.64), egc77 (MA-Fungi 83628). ARG-10-45: *Mulinum spinosum* twigs (mc, pH 7.01), egc78 (MA-Fungi 83629).

* ***Perichaena liceoides*** Rostaf.

ARG-09-08: *Colletia hystrix* bark (mc, pH 6.27), egc95 (MA-Fungi 83640).

The decision to maintain this species as distinct from *P. corticalis* is based on the small sporocarps with little capillitium. The number of *Perichaena* species with little or no capillitium is increasing (see comments under *P. nigra*) and pending further analysis we prefer to maintain it as separate from *P. corticalis.*

°***Perichaena luteola*** (Kowalski) Gilert
ARG-09-36: horse dung (mc, pH 6.98), egc92 (MA-Fungi 83638). ARG-09-43: horse dung (mc, pH 6.66), egc93 (MA-Fungi 83639).

Specimens of both collections are macroscopically identical to those described by Gilert (1995). However, they are microscopically distinguished from them because of their lack of capillitium. Spore shape, colour and size fit with the original description. In the Neotropics it has been previously reported from Mexico.

†***Perichaena madagascariensis*** D. Wrigley, Lado, Estrada & S.L. Stephenson
ARG-09-11: *Maihuenia poeppigii* remains (mc, pH 7,1), dwb 3350. ARG-09-21: *Maihuenia poeppigii* remains (mc, pH 7,3), dwb 3422; (mc, pH 7,1), dwb 3400; (mc, pH 7,5), dwb 3409; (mc, pH 7,1), dwb 3411. ARG-09-26: *Maihueniopsis darwinii* remains (mc, pH 8,1), dwb 3347; (mc, pH 8), dwb 3349. ARG-09-51: *Maihuenia patagónica* remains (mc, pH 5,9), dwb 3415. ARG-09-53: *Ephedra ochreata* twigs (mc, pH 6), dwb 3416; (mc, pH 6,7), dwb 3419. ARG-10-08: *Ephedra frustillata* twigs (mc, pH 5,9), dwb 3460. ARG-10-13: *Senecio* sp. (mc, pH 6,8), dwb 3459. ARG-10-39: *Maihuenia poeppigi* (mc, pH 6,2), dwb 3476. ARG-11-41: *Senecio* sp. twigs (mc, pH 6,5), dwb 3512. ARG-11-58: *Mulinum spinosum* twigs (mc, pH 6,8), dwb 3529; (mc, pH 5,9), dwb 3527.

These plentiful and large collections were compared with the type specimen of this species (MA-Fungi 82091), described as developing on twigs of *Euphorbia* spp., from southern Madagascar, in both moist chamber culture and naturally fruiting in the field (Wrigley de Basanta & al., 2013). The material from Patagonia has the characteristic crowded sporocarps on a common hypothallus, double peridium (Fig. 9B), inner surface very finely warted (Figs. 9A-9B), the perforate warted capillitium (Figs. 9C, 9E) and the densely warted spores with prominent pila by SEM (Figs. 9D, 9F) found in the Malagash material. The development of the appressed sporocarps in moist chamber culture under a jelly-like material is also similar. It is interesting to note that they were isolated from a variety of different substrates, mostly twigs, as in Madagascar, but also on cacti, and over a widespread area of Patagonia in 4 states. The reason for their appearance so very far away from the type locality is unknown but a possible reason could be that they descend from a very ancient common ancestor when these areas were not as far apart.

Perichaena nigra D. Wrigley, Lado & Estrada, ***sp. nov***. Fig. 10.
Mycobank: MB805789

Sporophores sporocarpic, scattered or in small groups of 2-4 appressed sporocarps, sessile. Sporotheca subglobose to sub-hemispherical, with a basal annular flange, 0.2-0.6 mm diam, 0.2-0.6 mm in length, 0.15-0.4 mm tall, black (267. Black) (Figs. 10A-10B). Hypothallus inconspicuous. Peridium double, outer layer thick, coriaceous, deep orange (51. deep O) to light brown (94. l. Ol Br) by LM, almost 10 µm thick (Fig. 10D), inner layer membranous, pale yellow (89. p. Y - 86. l. Y), strongly adhering to the external layer, with the inner surface almost smooth but with scattered warts by SEM (Figs. 10C-10D); dehiscence circumscissile below a dark raised line near the base (Figs. 10A-10B). Columella absent. Capillitium absent. Spores free, deep yellow (85. deep Y -82. v. Y) in mass, brilliant yellow (83. brill. Y) to mid yellow (87. m. Y) by LM, sub-globose, (13.5-)14-16(-16.5) µm diam., thick-walled with a thinner area of dehiscence, densely warted, ornamented with bacula and a roughened epispore by SEM (Figs. 10E-10F). Plasmodium brown.

Holotype: ARGENTINA, Santa Cruz, Magallanes, Puerto San Julián, route RP-25, 73 km East of Gobernador Gregores, 48°54′39.7″S 69°21′04.2″W, 285 m, 15-II-2012, on dead leaves on stem bases of *Azorella* sp. in moist chamber culture (pH 6.5), *D. Wrigley de Basanta,* dwb 3503 (MA-Fungi 6744).

Etymology: nigra (Lat. niger, -gra, -grum = black) for the colour of the sporocarps.

Habitat: dead leaves on stem bases of *Azorella* spp. (Apiaceae).

Known distribution: southern Argentina (province of Santa Cruz). Possibly occurring in other areas of South America, following the distribution of species of the plant genus *Azorella*.

Other specimens examined: ARGENTINA, Santa Cruz, Magallanes, Puerto San Julián, route RP-25, 73 km East of Gobernador Gregores, 48°54′39.7″S 69°21′04.2″W, 285 m, 13-IV-2012, on dead leaves on stem bases of *Azorella* sp. in moist chamber culture (pH 6.9), dwb 3513. Santa Cruz, Corpen Aike, Puerto Santa Cruz, route RP-9, 23 km West of the intersection with route RN-3, Estancia San Benito, 50°16′04.7″S 69°24′46.6″W, 358 m, 16-IV-2012, on dead leaves on stem bases of *Azorella* sp. in moist chamber culture (pH 7.4), dwb 3519. Ibidem, 4-VI-2012, on dead leaves on stem bases of *Azorella* sp. in moist chamber culture (pH 7.6), dwb 3524. Ibidem, 25-V-2012 on dead leaves on stem bases of *Azorella* sp. in moist chamber culture (pH 7.6), dwb 3525.

Other material studied: *Perichaena pachyderma* D.W. Mitchell, G. Moreno & M. Lizárraga. USA, New Mexico, Highway 85 at Missionary Road, on herbivore dung DWM 7759 (Typus).

The distinct characteristics of this species are the very thick black peridium, the dark line of dehiscence with a slight flange (like the prosoma of horseshoe crab), the deep yellow spore mass, the absence of capillitium and the ornamentation of the spore by SEM.

Culture of the new species on defined media has proved difficult. Germination in 48 h was achieved on 0.75% water agar (WA) several times from both collections dwb 3503 and dwb 3519. The spores swelled at one side (Figs. 10G-10H) and opened by means of a split forming near to one edge, almost always leaving a flap of the spore wall still attached (Fig. 10I). This is different from the crack, widening into a narrow slit with jagged edges, described by Keller & Eliasson (1992) for *Perichaena depressa*, and also different from the V-shaped

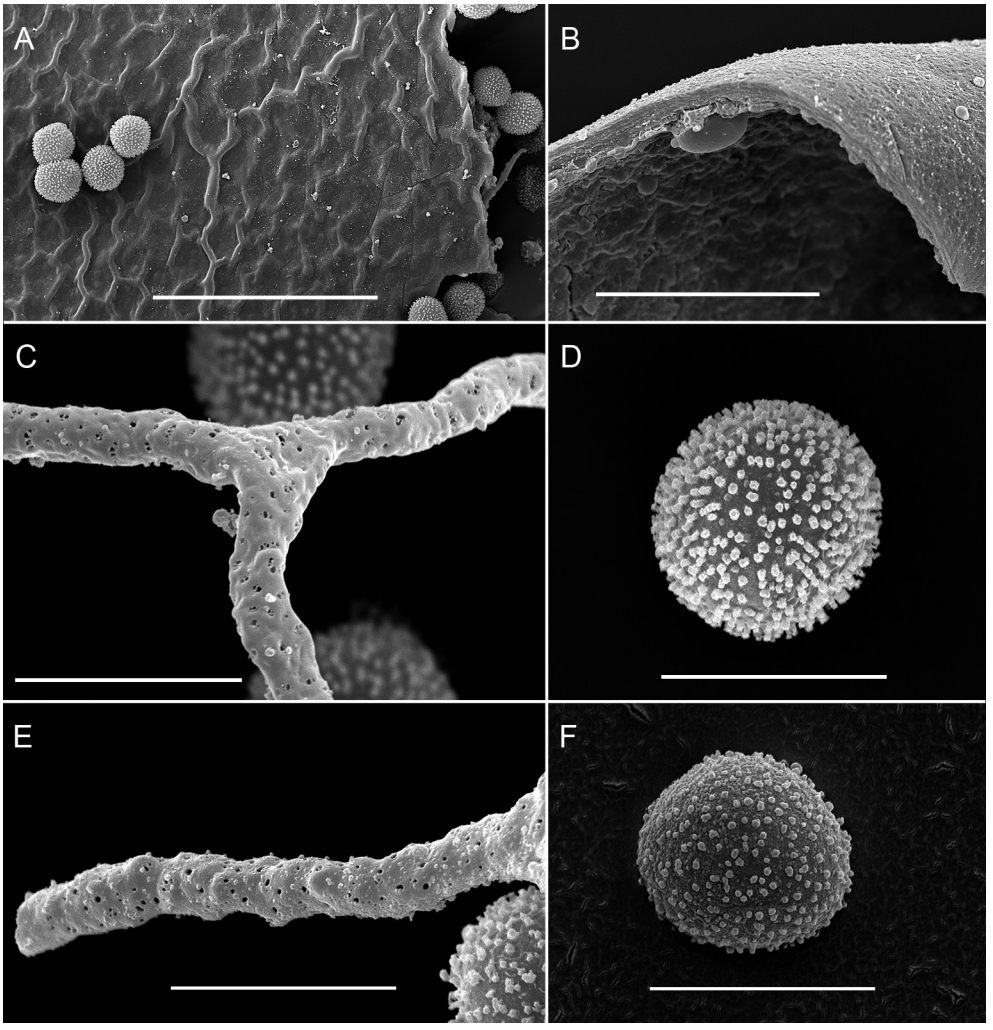

Fig. 9. *Perichaena madagascariensis* by SEM. **A.** Peridium marked with the impression of the spores (dwb 3527). **B.** Double peridium inner surface upwards (dwb 3476). **C.** Branched, perforated capillitium (dwb 3527). **D.** Spore (dwb 3527). **E.** Perforated capillitium (dwb 3476). **F.** Spore (dwb 3476). Bar: A=50 µm; B=20 µm; C-F=10 µm.

split common in the Physarales or the smooth edged pore common in the germination of *Licea* spp. Amoebae (Fig. 10J) were transferred to either weak malt yeast agar (wMY, see Haskins & Wrigley de Basanta 2008) or to 1,5% WA, each enriched with drops of an extract of the natural substratum *Azorella* sp. (25 g in 1L) as described in Wrigley de Basanta & al. (2012). Vigorous myxamoebal growth and swarm cell formation resulted on both media. Small grains of finely ground sterile Quaker Oat flour were added as the populations grew. Some cultures were set up with amoebae from the two different collections. These cultures formed very early plasmodia (Fig. 10K), but efforts to maintain these, or transfer them to richer media were unsuccessful, and always resulted in macro and microcyst formation never forming larger plasmodia or fructifications on agar. In moist chamber culture, the reddish brown plasmodium formed spheres of translucent brown protoplasm (Fig. 10L) that subsequently produced a brown, then hardened black, outer peridium. Distinct veins were not observed in the plasmodium, that appeared as a flat diffuse mass over the substrate, but the substrate is very dark and compact and it is possible that it had veins, as seen in other species of *Perichaena* (Ross, 1967; Keller & Eliasson, 1992), but that these were hidden inside the substrate. The cushion plants like *Azorella* species have been shown to generate a microenvironment inside the cushion with less extremes in temperature and increased moisture (Cavieres & al., 2007), more suitable for early stage and plasmodial development of myxomycetes. The mature sporocarps remain tightly closed on maturation and dehisce along the circumcissile flange only after thorough wetting. This may be another response to a hyperarid environment.

The dehiscence is somewhat similar to that found in *P. corticalis* (Batsch) Rostaf., but *P. nigra* differs in its persistent thick coriaceous outer peridium, the total lack of capillitium, its deep yellow spore mass, the brown plasmodium (watery grey in *P. corticalis*) and the different ornamentation of the spores. In addition, in *P. corticalis* the spores are golden yellow in mass and minutely warted, (9-) 11-13 (-14) µm (Martin & Alexopoulos, 1969) vs. 14-16 µm, strongly warted and deep yellow in mass in *P. nigra*. The thick peridium and lack of capillitium of the new species are similar to *Perichaena pachyderma*

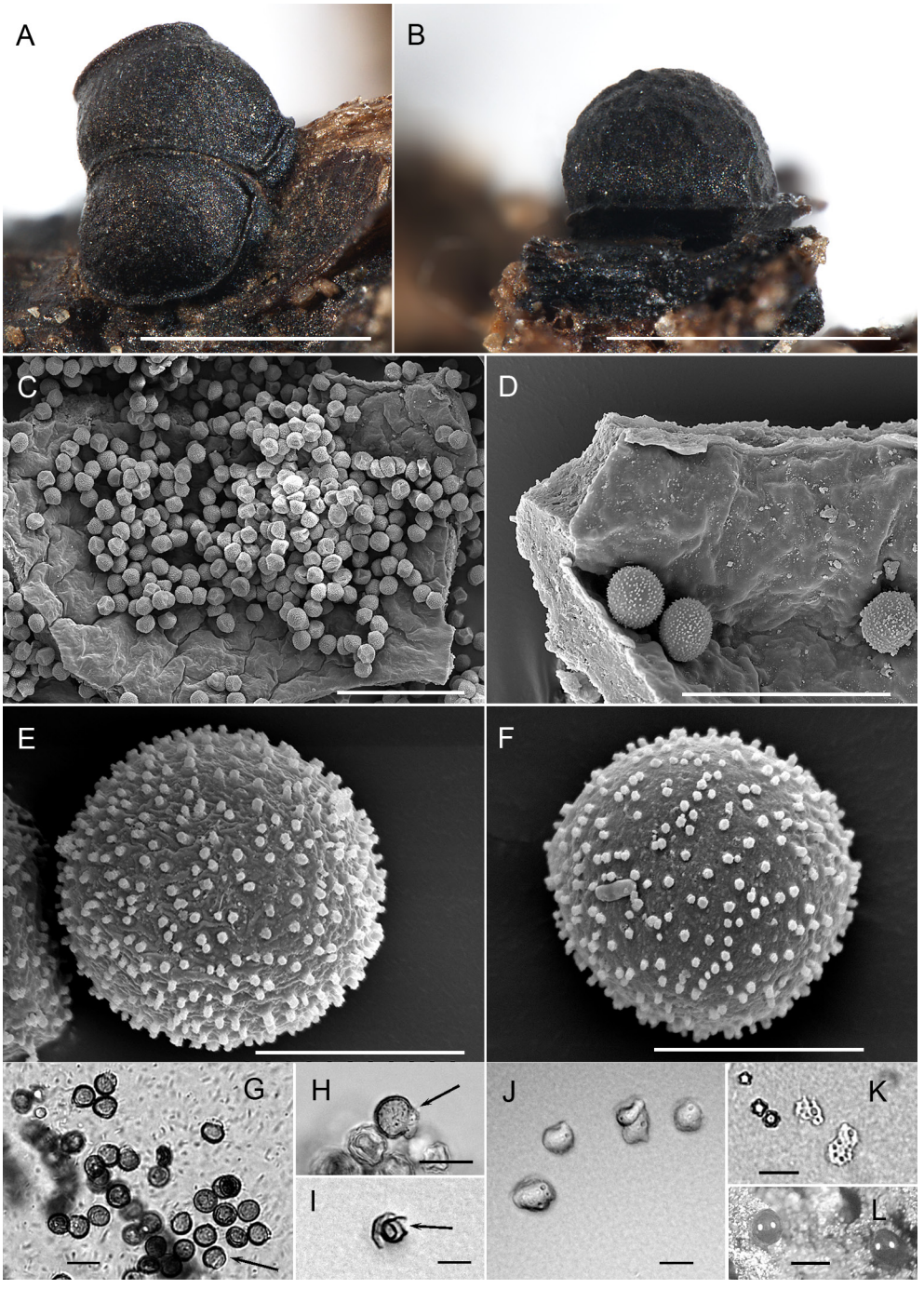

Fig. 10. *Perichaena nigra* (dwb 3503). **A-B.** Black sporocarps showing the basal annular flange. **C.** Peridium and spores by SEM. **D.** Thick, double peridium by SEM. **E.** Spore by SEM. **F.** Spore by SEM (dwb 3519). **G-H.** Germinating spores swelled at one side (arrows) by LM (dwb 3519). **I-J.** Stages in the life cycle on agar (dwb 3503). **K.** Amoeba leaving spore through a split with a flap of the spore wall still attached to the spore (arrow). **L.** Amoebae. **M.** Early plasmodia. **N.** Young sporocarps in moist chamber culture (dwb 3525). Bar: A-B, L=0.5 mm; C=100 µm; D=50 µm; E-F, K=10 µm; G, I=20 µm; H=15 µm; J=30 µm.

D.W. Mitchell, G. Moreno & M. Lizárraga. The new species was compared to type material of *P. pachyderma* and *P. nigra* differed in its colour (black vs. reddish brown), its larger sporocarp size (0.2 - 0.6 vs 0.1 - 0.3 mm), and its spore size (14-16 µm vs. 10-11 µm). In addition *P. pachyderma* is coprophilous, and has irregular dehiscence (Mitchell & al., 2011), whereas *P. nigra* is folicolous, and dehiscence is circumcissile by a preformed raised line. The maturation of the sporocarps also differs, since in *P. pachyderma* the pale yellow inner peridium is formed first, and then covered by a gelatinous mass (Mitchell & al., 2011), while in *P. nigra* the spheres of translucent brown protoplasm form an outer brown cover that hardens and darkens on drying.

Other species of the genus *Perichaena* that have been described with scant or no capillitium include *P. liceoides*

Rostaf., *P. taimyriensis* Novozh. & Schnittler (Novozhilov & Schnittler, 2000) *P. polygonospora* Novozh., Zemly., Schnittler & S.L. Stephenson and *P. heterospinispora* Novozh., Zemly., Schnittler & S.L. Stephenson (Novozhilov & al., 2008). *Perichaena liceoides* has a single thin peridium that dehisces irregularly and also differs in its spore size (9.2-10 µm diam vs. 14-16 µm) and ornamentation by SEM of prominent even pila (Gilert, 1990). *Perichaena taimyriensis* is a buff yellow to apricot orange colour, not black as *P. nigra*. The former also dehisces irregularly, and its spores have a uniformely thickened wall and are pilate by SEM. *Perichaena polygonospora* and *P. heterospinispora* are both stipitate and have very distinctive spores (Novozhilov & al., 2008).

The differences between the species of *Perichaena* without capillitium and species of the genus *Licea*, mainly characterized by a lack of capillitium, are slight. Authors of three of the species with no capillitium, above, suggest that the yellow spore colour differentiates them from most *Licea* species, and that these species may be intermediates between the genera (Novozhilov & al., 2008). Wrigley de Basanta & al. (2010a) pointed out that the presence of a protoplasmodium can be an additional character used to define the genus *Licea*. In the case of *P. nigra*, the plasmodium was definitely not a protoplasmodium. Future molecular data may help to delimit these genera and some of the species in each.

Perichaena quadrata T. Macbr.
ARG-09-23: *Prosopis denudans* bark (mc, pH 6.90), egc80 (MA-Fungi 83630). ARG-09-26: *Larrea nitida* bark (mc, pH 6.90), egc81 (MA-Fungi 83631). ARG-09-28: horse dung (mc, pH 7.99), egc82 (MA-Fungi 83632). ARG-09-35: *Larrea cuneifolia* bark (mc, pH 7.25), egc70 (MA-Fungi 83621). ARG-09-42: *Junellia mulinioides* bark (mc, pH 7.13), egc85 (MA-Fungi 83634). ARG-09-44: *Chuquiraga avellanedae* leaf litter (mc, pH 6.13), egc84 (MA-Fungi 83633). ARG-10-17: *Senecio filaginoides* bark (mc, pH 7.00), egc88 (MA-Fungi 83636).

Perichaena vermicularis (Schwein.) Rostaf.
ARG-09-01: *Senecio filaginoides* twigs, Lado 20205 (MA-Fungi 82866), 20208 (MA-Fungi 82868); *Mulinum spinosum* twigs, Lado 20207 (MA-Fungi 82867). ARG-09-09: *Astrocedrus chilensis* twigs, Lado 20312 (MA-Fungi 86532). ARG-09-29: *Psilla spartiodes* bark (mc, pH 6.65), egc90 (MA-Fungi 83637). ARG-09-31: *Ephedra ochreata* twigs (mc, pH 5,6), dwb 3448. ARG-09-55: *Mulinum spinosum* twigs, Lado 20413 (MA-Fungi 86533), 20414 (MA-Fungi 86534). ARG-09-64: *Senecio* sp. twigs, Lado 20937 (MA-Fungi 83136), 20938 (MA-Fungi 83164), 20939 (MA-Fungi 86536), 20940 (MA-Fungi 86537) 20947 (MA-Fungi 86538), 20948 (MA-Fungi 86539); *Stellingia patagónica* twigs, Lado 20942 (MA-Fungi 83165); *Mullinum spinosum* twigs, Lado 20944 (MA-Fungi 86535). ARG-09-65: *Nausauvia glomerulosa* twigs, Lado 20952 (MA-Fungi 83171), 20954 (MA-Fungi 83173). ARG-09-66: *Senecio* sp. twigs, Lado 20960 (MA-Fungi 83179). ARG-10-02: *Atriplex* sp. log, Lado 21087 (MA-Fungi 86540). ARG-10-10: *Senecio filaginoides* bark, Lado 21095 (MA-Fungi 86541). ARG-10-14: *Senecio filaginoides* twigs, Lado 21099 (MA-Fungi 86543); *Mulinum spinosum* twigs, Lado 21100 (MA-Fungi 86542). ARG-10-24: *Senecio filaginoides* twigs, Lado 21115 (MA-Fungi 86544). ARG-10-25: *Mulinum spinosum* twigs, Lado 21116 (MA-Fungi 86545). ARG-10-43: *Senecio* sp. twigs, Lado 21301 (MA-Fungi 86546). ARG-10-45: *Senecio* sp. twigs, Lado 21310 (MA-Fungi 86547), 21311 (MA-Fungi 86548). ARG-11-16: *Senecio* sp. twigs, Lado 21401 (MA-Fungi 83496), Lado 21402 (MA-Fungi 86549). ARG-11-28: *Senecio* sp. twigs, Lado 21413 (MA-Fungi 83506), 21415 (MA-Fungi 86550), 21418 (MA-Fungi 86551), Lado 21420 (MA-Fungi 86552). ARG-11-30: *Senecio* sp. twigs, Lado 21424 (MA-Fungi 86556), 21425 (MA-Fungi 86557), 21427 (MA-Fungi 86553), 21429 (MA-Fungi 86554), 21431 (MA-Fungi 86555). ARG-11-33: *Senecio* sp. twigs, Lado 21432 (MA-Fungi 86558), 21433 (MA-Fungi 86559), 21436 (MA-Fungi 86560). ARG-11-34: *Senecio* sp. twigs, Lado 21437 (MA-Fungi 86561). ARG-11-40: *Senecio* sp. twigs, Lado 21441 (MA-Fungi 86562). ARG-11-41: *Senecio* sp. twigs, Lado 21443 (MA-Fungi 86563); *Senecio* sp. twigs (mc, pH 6,5), dwb 3486; (mc, pH 6,8), dwb 3484. ARG-11-42: *Senecio* sp. twigs, Lado 21444 (MA-Fungi 86564), 21445 (MA-Fungi 86565). ARG-11-44: *Senecio* sp. twigs, Lado 21446 (MA-Fungi 86566). ARG-11-57: *Senecio* sp. twigs, Lado 21499 (MA-Fungi 86567), 21501 (MA-Fungi 86568), 21502 (MA-Fungi 86569), 21503 (MA-Fungi 86570). ARG-11-59: *Senecio* sp. twigs, Lado 21505 (MA-Fungi 86571), 21507 (MA-Fungi 86572), 21510 (MA-Fungi 86573). ARG-11-60: *Senecio* sp. twigs, Lado 21515 (MA-Fungi 86574), 21516 (MA-Fungi 86575), 21517 (MA-Fungi 86576), 21518 (MA-Fungi 86577).

Many of these collections had darker brown sporocarps (Fig. 3F) and spores of 15-16.5 µm diam that is the upper extreme of the normal size for the species, and the capillitium was in the form of flat tapes rather than threads. Otherwise they were typical of this species. They may indicate an ecotype or even a cryptic species but further studies would be needed to confirm this. Ross (1967) commented that in rich agar cultures the spores were larger and averaged 16 µm diam.

Physarum album (Bull.) Chevall.
ARG-09-03: *Astrocedrus chilensis* wood, Lado 20224 (MA-Fungi 82876), 20226 (MA-Fungi 86578), 20229 (MA-Fungi 82877), 20245 (MA-Fungi 82886), 20247 (MA-Fungi 82888). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20456 (MA-Fungi 82993). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20505 (MA-Fungi 83034). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20580 (MA-Fungi 83108) 20581 (MA-Fungi 83109), 20583 (MA-Fungi 83111), 20585 (MA-Fungi 83113), 20586 (MA-Fungi 83115), 20590 (MA-Fungi 83119) 20593 (MA-Fungi 83121), 20594 (MA-Fungi 83122); *Astrocedrus chilensis* wood, Lado 20609 (MA-Fungi 83134); wood, Lado 20642 (MA-Fungi 83158), 20645 (MA-Fungi 83162). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21061 (MA-Fungi 83261); fungal remains, Lado 21070 (MA-Fungi 83268). ARG-10-31: *Nothofagus pumilio* wood, Lado 21192 (MA-Fungi 83351). ARG-10-32: *Austrocedrus chilensis* wood, Lado 21216 (MA-Fungi 83370). ARG-10-34: *Nothofagus dombeyii* wood, Lado 21243 (MA-Fungi 86579), 21254 (MA-Fungi 83398). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21279 (MA-Fungi 83418). ARG-11-02: *Nothofagus antarctica* wood, Lado 21338 (MA-Fungi 83444).

Physarum andinum A. Ronikier & Lado
ARG-11-52: *Nothofagus pumilio* wood, Lado 21496 (MA-Fungi 82129).

A new record of this species, recently described from Argentina and Chile (Ronikier & al., 2013). It is usually a nivicolous species, and this small collection was probably a remnant from the previous season.

Physarum bethelii T. Macbr. ex G. Lister
ARG-09-59: *Nothofagus dombeyii* wood, Lado 20492 (MA-Fungi 86580).

Physarum bitectum G. Lister
ARG-09-02: *Eryngium paniculatum* leaves, Lado 20217 (MA-Fungi 86581), 20222 (MA-Fungi 86582). ARG-09-61: *Astrocedrus chilensis* wood, Lado 20607 (MA-Fungi 83132); *Populus* sp. leaves, Lado 20619 (MA-Fungi 83141), 20621 (MA-Fungi 83142). ARG-10-30: *Nothofagus pumilio* wood, Lado 21187 (MA-Fungi 83348). ARG-11-50: *Nothofagus pumilio* wood, Lado 21454 (MA-Fungi 83516). ARG-11-51: *Nothofagus pumilio* wood, Lado 21477 (MA-Fungi 83537). ARG-11-53: *Nothofagus pumilio* wood, Lado 21498 (MA-Fungi 83556).

* ***Physarum brunneolum*** (W. Phillips) Massee
ARG-09-02: *Eryngium paniculatum* leaves, Lado 20213 (MA-Fungi 82869), 20214 (MA-Fungi 82870), 20216 (MA-Fungi 82872).

Physarum cinereum (Batsch) Pers.
ARG-09-03: *Astrocedrus chilensis* bark, Lado 20250 (MA-Fungi 82891). ARG-09-11: *Maihuenia poeppigii* remains (mc, pH 7,1), dwb 3328, dwb 3327. ARG-09-27: *Ephedra ochreata* Wood (mc, pH 6.34), ET-12186. ARG-09-40: *Jarava patagonica* leaf litter (mc, pH 6.59), egc278 (MA-Fungi 83747). ARG-09-46: *Lyceum ameghinoi* bark (mc, pH 6.1), dwb 3278. ARG-09-53: *Ephedra ochreata* twigs (mc, pH 6.1), dwb 3417. ARG-10-19: *Mulinum spinosum* twigs, Lado 21109 (MA-Fungi 86583), 21112 (MA-Fungi 83284), 21114 (MA-Fungi 83286). ARG-10-27: *Nothofagus pumilio* wood, Lado 21175 (MA-Fungi 83337). ARG-11-15: *Senecio* sp. twigs, Lado 21393 (MA-Fungi 83491). ARG-11-31: *Lepidophyllum cupressiforme* bark (mc, pH 6.6), dwb 3498.

Physarum compressum Alb. & Schwein.
ARG-09-10: herbivore dung (mc, pH 7.20), egc198 (MA-Fungi 83724). ARG-09-23: leaf litter (mc, pH 7.51), egc199 (MA-Fungi 83725). ARG-09-42: *Chuquiraga hystrix* bark (mc, pH 6.84), egc200 (MA-Fungi 83726). ARG-09-66: *Senecio filaginoides* bark (mc, pH 7.21), egc214 (MA-Fungi 83736). ARG-10-21: *Senecio filaginoides* bark (mc, pH 6.57), egc201 (MA-Fungi 83727). ARG-10-42: *Mulinum spinosum* twigs (mc, pH 6.83), egc202a (MA-Fungi 83728).

Physarum decipiens M.A. Curtis
ARG-09-27: *Schinus johnstonii* bark (mc, pH 7.09), egc192 (MA-Fungi 83718). ARG-09-32: *Mulinum spinosum* twigs (mc, pH 5.84), egc193 (MA-Fungi 83719). ARG-09-34: *Montea aphylla* bark (mc, pH 6.90), egc194 (MA-Fungi 83720); *Schinus johnstonii* bark (mc, pH 6.66), egc195 (MA-Fungi 83721). ARG-09-35: *Montea aphylla* bark (mc, pH 7.25), egc196 (MA-Fungi 83722). ARG-09-36: *Schinus johnstonii* bark (mc, pH 6.79), egc197 (MA-Fungi 83723).

Physarum galbeum Wingate cf.
ARG-09-59: *Nothofagus dombeyii* wood, Lado 20489 (MA-Fungi 86584).

Physarum leucophaeum Fr. & Palmquist
ARG-09-03: twigs, Lado 20251 (MA-Fungi 82892). ARG-09-19: *Araucaria araucana* log, Lado 20392 (MA-Fungi 82937). ARG-09-23: *Prosopis denudans* bark (mc, pH 6.90), egc150 (MA-Fungi 83682). ARG-09-28: *Lycium chilense* bark (mc, pH 7.38), egc159 (MA-Fungi 83869). ARG-09-28: *Atriplex* spp. twigs (mc, pH 6.76), egc157 (MA-Fungi 83687). ARG-09-28: *Suaeda divaricata* twigs (mc, pH 6.37), egc158 (MA-Fungi 83688). ARG-09-29: *Atriplex lampa* bark (mc, pH 6.07), egc215 (MA-Fungi 83737). ARG-09-33: *Larrea cunefolia* bark (mc, pH 6.30), egc162 (MA-Fungi 83692). ARG-09-36: *Chuquiraga avellanedae* leaf litter (mc, pH 6.78), egc164 (MA-Fungi 83693). ARG-09-37: *Prosopidastrum globosum* bark (mc, pH 7.16), egc165 (MA-Fungi 83694); *Lycium chilense* bark (mc, pH 7.28), egc166 (MA-Fungi 83695). ARG-09-43: *Larrea divaricata* twigs (mc, pH 4.88), egc169 (MA-Fungi 83697). ARG-09-46: *Lycium ameginoi* bark (mc, pH 6.97), egc170 (MA-Fungi 83698). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20429 (MA-Fungi 82966). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20448 (MA-Fungi 82985). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20543 (MA-Fungi 83071). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20550 (MA-Fungi 83078) 20552 (MA-Fungi 83080), 20591 (MA-Fungi 83120), 20597 (MA-Fungi 83124); *Populus* sp. wood, Lado 20629 (MA-Fungi 83148); *Astrocedrus chilensis* needles and bark, Lado 20630 (MA-Fungi 83149); wood, Lado 20633 (MA-Fungi 83152), 20642 (MA-Fungi 83159). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21046 (MA-Fungi 83248), 21048 (MA-Fungi 83249). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21052 (MA-Fungi 83253). ARG-10-31: *Nothofagus pumilio* wood, Lado 21194 (MA-Fungi 83353), 21198 (MA-Fungi 83356). ARG-10-32: *Austrocedrus chilensis* wood, Lado 21212 (MA-Fungi 83368). ARG-10-33: wood, Lado 21226 (MA-Fungi 83378), 21227 (MA-Fungi 83379). ARG-10-39: *Mulinum spinosum* twigs (mc, pH 6.94), egc223 (MA-Fungi 83744). ARG-11-11: *Nothofagus pumilio* wood, Lado 21372 (MA-Fungi 83470).

Physarum licheniforme (Schwein.) Lado
ARG-09-02: *Eryngium paniculatum* leaves, Lado 20222 (MA-Fungi 86585). ARG-09-25: *Larrea divaricata* twigs (mc, pH 6.26), egc203 (MA-Fungi 83729). ARG-09-31: *Ephedra ochreata* twigs, (mc, pH 5,7), dwb 3451. ARG-09-33: *Larrea cunefolia* bark (mc, pH 6.30), egc204 (MA-Fungi 83730). ARG-09-37: *Prosopidastrum globosum* bark (mc, pH 7.16), egc205 (MA-Fungi 83731). ARG-09-44: *Chuquiraga avellanedae* twigs (mc, pH 5.17), egc206 (MA-Fungi 83732). ARG-10-39: *Maihuenia poeppigii* (mc, pH 6,9), dwb 3474.

° ***Physarum luteolum*** Peck
ARG-09-59: *Nothofagus dombeyii* wood, Lado 20477 (MA-Fungi 83008). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20595 (MA-Fungi 82123).

In the Neotropics it has been previously reported from Mexico.

Physarum melleum (Berk. & Broome) Massee
ARG-09-03: leaves, Lado 20241 (MA-Fungi 86586). ARG-09-61: *Astrocedrus chilensis* needles, Lado 20603 (MA-Fungi 86588); *Nothofagus dombeyii* wood, Lado 20572 (MA-Fungi 86587).

* ***Physarum newtonii*** T. Macbr.
ARG-10-19: *Festuca argentina* blades, Lado 21104 (MA-Fungi 83280), 21105 (MA-Fungi 83281). ARG-11-17: *Nothofagus pumilio* wood, Lado 21408 (MA-Fungi 83501), 21409 (MA-Fungi 83502), 21410 (MA-Fungi 83503).

Physarum notabile T. Macbr.
ARG-09-22: *Larrea cuneifolia* twigs (mc, pH 4.85), egc149 (MA-Fungi 83681). ARG-09-25: leaf litter (mc, pH 6.75), egc153 (MA-Fungi 83684); *Ephedra ochreata* bark (mc, pH 6.81), egc154 (MA-Fungi 83685). ARG-09-26: *Schinus johnstonii* bark (mc, pH 6.52), egc155 (MA-Fungi 83686). ARG-09-27: *Ephedra ochreata* twigs (mc, pH 5.3), dwb 3444. ARG-09-33: *Prosopidastrum groblosum* bark (mc, pH 6.62), egc160 (MA-Fungi 83690); *Mulinum spinosum* twigs (mc, pH 6.95), egc161 (MA-Fungi 83691). ARG-09-36: *Schinus johnstonii* bark (mc. pH 6.8), dwb 3425. ARG-09-37: *Agave* sp. leaves, Lado 20407 (MA-Fungi 86589). ARG-09-44: *Lycium ameghinoi* bark (mc, pH 7,1), dwb 3423. ARG-09-46: *Lycium ameghinoi* bark (mc, pH 6), dwb 3307; (mc, pH 6.1), dwb 3303; *Chuquiraga hystrix* bark (mc, pH 6.89), egc167 (MA-Fungi 83696). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21059 (MA-Fungi 83259). ARG-10-02: *Festuca* spp. blades (mc, pH 6.93), egc171 (MA-Fungi 83699). ARG-10-07: *Prosopis denudans* bark (mc, pH 6.88), egc173 (MA-Fungi 83700). ARG-10-13: *Senecio filaginoides* bark (mc, pH 7.02), egc174

(MA-Fungi 83701), leaf litter (mc, pH 7.63), egc175 (MA-Fungi 83702). ARG-10-15: *Schinus johnstonii* bark (mc, pH 6.36), egc176 (MA-Fungi 83703). ARG-10-16: *Junellia tridens* bark (mc, pH 6,37), egc177 (MA-Fungi 83704); *Mulinum spinosum* twigs (mc, pH 6.86), egc178 (MA-Fungi 83705); *Senecio filaginoides* bark (mc, pH 7.05), egc179 (MA-Fungi 83706). ARG-10-20: *Mulinum spinosum* twigs (mc, pH 6.75), egc180 (MA-Fungi 83707); *Schinus johnstonii* bark (mc, pH 5.94), egc181 (MA-Fungi 83708). ARG-10-21: *Schinus johnstonii* bark (mc, pH 5.70), egc182 (MA-Fungi 83709); *Colliguaja integerrima* bark (mc, pH 5.76), egc183 (MA-Fungi 83710); *Senecio filaginoides* bark (mc, pH 6.57), egc184 (MA-Fungi 83711). ARG-10-22: *Mulinum spinosum* twigs (mc, pH 6.75), egc185 (MA-Fungi 83712). ARG-10-25: *Mulinum spinosum* twigs (mc, pH 6.86), egc186 (MA-Fungi 83713). ARG-10-37: *Senecio filaginoides* bark (mc, pH 6.62), egc187 (MA-Fungi 83714); *Mulinum spinosum* twigs (mc, pH 6.75), egc188 (MA-Fungi 83715). ARG-10-38: *Mulinum spinosum* twigs (mc, pH 6.66), egc189 (MA-Fungi 83716); *Senecio filaginoides* bark (mc, pH 67.02), egc190 (MA-Fungi 83717). ARG-10-42: *Mulinum spinosum* twigs (mc, pH 6.83), egc202b (MA-Fungi 86612). ARG-10-43: *Senecio filaginoides* bark (mc, pH 7.64), egc222 (MA-Fungi 83743). ARG-11-08: *Senecio* sp. (ground litter) (mc, pH 6.60), egc297 (MA-Fungi 83754).

* ***Physarum oblatum*** T. Macbr.
ARG-10-03: *Maihueniopsis darwinii* (mc, pH 6,7), dwb 3475.

Physarum ovisporum G. Lister
ARG-09-02: *Eryngium paniculatum* leaves, Lado 20209 (MA-Fungi 86590), 20210 (MA-Fungi 86591) 20211 (MA-Fungi 86592), 20215 (MA-Fungi 86593), 20216 (MA-Fungi 82873), 20218 (MA-Fungi 86594), 20219 (MA-Fungi 86595). ARG-09-05: *Eryngium paniculatum* leaves, Lado 20259 (MA-Fungi 86596), 20260 (MA-Fungi 86597) 20261 (MA-Fungi 86598), 20267 (MA-Fungi 82899), 20268 (MA-Fungi 82900), 20269 (MA-Fungi 82901).

Physarum pusillum (Berk. & M.A. Curtis) G. Lister
ARG-09-66: *Senecio* sp. twigs, Lado 20959 (MA-Fungi 83178); *Grindellia chiloensis* twigs, Lado 20962 (MA-Fungi 83180), 20964 (MA-Fungi 83182), 20965 (MA-Fungi 83183). ARG-10-11: *Senecio filaginoides* twigs, Lado 21096 (MA-Fungi 86599). ARG-10-19: *Mulinum spinosum* twigs, Lado 21107 (MA-Fungi 86600). ARG-10-20: sheep droppings (mc, pH 6.59), egc276 (MA-Fungi 83745). ARG-11-28: *Senecio* sp. twigs, Lado 21422 (MA-Fungi 86601). ARG-11-29: *Lycium chilense* bark (mc, pH 6.5), dwb 3502. ARG-11-33: *Senecio* sp. twigs, Lado 21434 (MA-Fungi 86602). ARG-11-60: *Senecio* sp. twigs, Lado 21519 (MA-Fungi 86603).

* ***Physarum robustum*** (Lister) Nann.-Bremek.
ARG-09-68: *Nothofagus dombeyii* wood, Lado 21042 (MA-Fungi 83246).

Physarum spectabile Nann.-Bremek., Lado & G. Moreno
ARG-09-49: *Ephedra ochreata* twigs (mc, pH 6,9), dwb 3454. ARG-10-40: *Lycium ameghinoi* (mc, pH 6,7), dwb 3478.

* ***Physarum superbum*** Hagelst.
ARG-11-59: *Senecio* sp. twigs, Lado 21509 (MA-Fungi 83557).

This collection had sessile sporocarps mixed with short plasmodiocarps with orange yellow flakes of lime on a greyish iridescent peridium (Fig. 3G), sometimes limeless below. The typically physaroid capillitium has small yellow nodes.

Physarum vernum
ARG-09-31: *Ephedra ochreata* twigs (mc, pH 5.6), dwb 3442. ARG-10-45: *Senecio* sp. twigs, Lado 21309 (MA-Fungi 86604).

Physarum viride (Bull.) Pers.
ARG-09-59: *Nothofagus dombeyii* wood, Lado 20486 (MA-Fungi 83017). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20516 (MA-Fungi 83044). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20560 (MA-Fungi 83089) 20562 (MA-Fungi 83092); *Astrocedrus chilensis* wood, Lado 20608 (MA-Fungi 83133). ARG-09-67: *Nothofagus* sp. wood, Lado 20982 (MA-Fungi 83196), 20983 (MA-Fungi 83197), 20984 (MA-Fungi 83198), 20991 (MA-Fungi 83206), 21013 (MA-Fungi 83227). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21019 (MA-Fungi 83231), 21036 (MA-Fungi 83243). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21051 (MA-Fungi 83252), 21057 (MA-Fungi 83257), 21063 (MA-Fungi 83262). ARG-10-26: *Nothofagus pumilio* wood, Lado 21121 (MA-Fungi 83289). ARG-10-30: *Nothofagus pumilio* wood, Lado 21185 (MA-Fungi 83346). ARG-10-34: wood, Lado 21239 (MA-Fungi 83387); *Nothofagus dombeyii* wood, Lado 21246 (MA-Fungi 83392).

° ***Protophysarum phloiogenum*** M. Blackw. & Alexop.
ARG-09-33: *Larrea cunefolia* bark (mc, pH 6.30), egc211 (MA-Fungi 83735).

Only one collection was obtained in moist chamber of this species, characterized by their minute sporocarps, 0.2-0.4 mm in total height (Fig. 3H), with a rudimentary and not calcareous capillitium (Fig. 11A), the spores minutely and densely warted and with some warts fused in a subreticulum (Figs. 11B-11C) similar to the paratype from Colorado (USA), illustrated by Castillo & al. (1998). Some sporocarps of this collection have shorter and thicker stalks than the original description. Collections with similar forms (LE50502) were commented on from Kazakhstan and Mongolia in Castillo & al. (1998). In the Neotropics it has been previously reported from Mexico, but this is a new record for South America.

Reticularia intermedia Nann.-Bremek.
ARG-10-35: *Nothofagus dombeyi* wood, Lado 21264 (MA-Fungi 83405).

Reticularia jurana Meyl.
ARG-09-20: *Populus* sp. log, Lado 20403 (MA-Fungi 82947). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20446 (MA-Fungi 82982). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20479 (MA-Fungi 83010), 20480 (MA-Fungi 83011) 20481 (MA-Fungi 83012), 20482 (MA-Fungi 83013), 20490 (MA-Fungi 83020) 20491 (MA-Fungi 83021), 20496 (MA-Fungi 83025). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20549 (MA-Fungi 83077). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20557 (MA-Fungi 83086), 20558 (MA-Fungi 83087). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21079 (MA-Fungi 83274). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21275 (MA-Fungi 83414), 21276 (MA-Fungi 83415). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21281 (MA-Fungi 83420). ARG-11-02: *Nothofagus antarctica* wood, Lado 21335 (MA-Fungi 83443). ARG-11-17: *Nothofagus pumilio* wood, Lado 21407 (MA-Fungi 83500).

Reticularia olivacea (Ehrenb.) Fr.
ARG-11-53: *Nothofagus pumilio* wood, Lado 21497 (MA-Fungi 83555).

Stemonitis axifera (Bull.) T. Macbr.
ARG-09-61: *Nothofagus dombeyii* wood, Lado 20584 (MA-Fungi 83112). ARG-10-26: *Nothofagus pumilio* wood, Lado 21155 (MA-Fungi 83319). ARG-10-30: *Nothofagus pumilio* wood, Lado 21182 (MA-Fungi 83343). ARG-10-31: *Nothofagus pumilio* wood, Lado 21193 (MA-Fungi 83352).

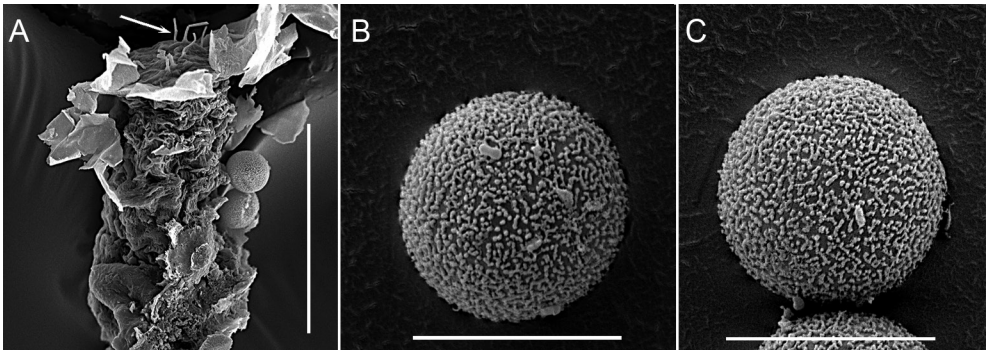

Fig. 11. *Protophysarum phloiogenum* (egc 211) by SEM. **A.** Open sporocarp showing the rudimentary and not calcareous capillitium (arrow). **B-C.** Spores. Bar: A = 50 µm; B-C = 10 µm.

Stemonitis fusca Roth
ARG-11-05: *Berberis* sp. (calafate) bark (mc, pH 6), dwb 3528. ARG-11-18: *Nothofagus pumilio* wood (mc, pH 5,7), dwb 3521.

Stemonitis lignicola Nann.-Bremek.
ARG-09-61: *Nothofagus dombeyii* wood, Lado 20554 (MA-Fungi 83082), 20560 (MA-Fungi 83090); wood, Lado 20641 (MA-Fungi 83157). ARG-09-67: *Nothofagus* sp. wood, Lado 21008 (MA-Fungi 83222), 21010 (MA-Fungi 83224).

Stemonitis splendens Rostaf.
ARG-10-36: *Nothofagus dombeyii* wood, Lado 21285 (MA-Fungi 83424), 21286 (MA-Fungi 83425).

Stemonitopsis hyperopta (Meyl.) Nann.-Bremek.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21140 (MA-Fungi 83303).

Trichia affinis de Bary
ARG-09-06: *Araucaria araucana* bark, Lado 20278 (MA-Fungi 82906). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20434 (MA-Fungi 82971). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20511 (MA-Fungi 83039), 20512 (MA-Fungi 83040), 20524 (MA-Fungi 83052), 20540 (MA-Fungi 83068) 20541 (MA-Fungi 83069), 20546 (MA-Fungi 83074), 20547 (MA-Fungi 83075); *Nothofagus dombeyii* loog, Lado 20967 (MA-Fungi 83184). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20551 (MA-Fungi 83079), 20561 (MA-Fungi 83091), 20564 (MA-Fungi 83094), 20569 (MA-Fungi 83098), 20575 (MA-Fungi 83012); *Astrocedrus chilensis* cone, Lado 20604 (MA-Fungi 83130); *Astrocedrus chilensis* wood, Lado 20605 (MA-Fungi 83131); *Populus* sp. leaf litter, Lado 20622 (MA-Fungi 83143); *Populus* sp. wood, Lado 20624 (MA-Fungi 83145); *Populus* sp. leaves and wood, Lado 20627 (MA-Fungi 83146), 20628 (MA-Fungi 83147); wood and twigs, Lado 20631 (MA-Fungi 83150); fern fronds, Lado 20636 (MA-Fungi 83153). ARG-09-66: *Festuca payescens* blades, Lado 20958 (MA-Fungi 83177). ARG-09-67: *Nothofagus* sp. wood, Lado 20996 (MA-Fungi 83211), 21009 (MA-Fungi 83223). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21032 (MA-Fungi 83239), 21033 (MA-Fungi 83240), 21034 (MA-Fungi 83241), 21038 (MA-Fungi 83244), 21043 (MA-Fungi 83247). ARG-09-69: *Nothofagus dombeyii* bark, Lado 21055 (MA-Fungi 83256). ARG-10-18: *Nothofagus pumilio* loog, Lado 21103 (MA-Fungi 83279). ARG-10-26: *Nothofagus pumilio* wood, Lado 21145 (MA-Fungi 83309), 21156 (MA-Fungi 83321). ARG-10-27: *Nothofagus pumilio* wood, Lado 21159 (MA-Fungi 83324), 21161 (MA-Fungi 83325), 21162 (MA-Fungi 83326), 21168 (MA-Fungi 83330). ARG-10-30: *Nothofagus pumilio* wood, Lado 21184 (MA-Fungi 83345). ARG-10-31: *Nothofagus pumilio* wood, Lado 21190 (MA-Fungi 83350). ARG-10-33: wood, Lado 21231 (MA-Fungi 83382). ARG-10-34: *Nothofagus dombeyii* wood, Lado 21241 (MA-Fungi 83389), 21244 (MA-Fungi 83390), 21245 (MA-Fungi 83391), 21251 (MA-Fungi 83396). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21289 (MA-Fungi 83428). ARG-11-02: *Nothofagus antarctica* wood, Lado 21334 (MA-Fungi 83442). ARG-11-11: *Nothofagus pumilio* wood, Lado 21361 (MA-Fungi 83461). ARG-11-12: *Nothofagus pumilio* wood, Lado 21374 (MA-Fungi 83471), 21376 (MA-Fungi) 83474. ARG-11-50: *Nothofagus pumilio* wood, Lado 21455 (MA-Fungi 83517), 21457 (MA-Fungi 83519). ARG-11-51: *Nothofagus pumilio* wood, Lado 21467 (MA-Fungi 83529), 21493 (MA-Fungi 83552).

Trichia botrytis (J.F. Gmel.) Pers.
ARG-09-56: *Nothofagus dombeyii* wood, Lado 20418 (MA-Fungi 82955), 20421 (MA-Fungi 82959). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20476 (MA-Fungi 83007), Lado 20483 (MA-Fungi 83014), Lado 20487 (MA-Fungi 83018). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20510 (MA-Fungi 83038), Lado 20519 (MA-Fungi 83047), Lado 20521 (MA-Fungi 83049), Lado 20522 (MA-Fungi 83050), Lado 20525 (MA-Fungi 83053), Lado 20526 (MA-Fungi 83054), Lado 20529 (MA-Fungi 83058), Lado 20530 (MA-Fungi 83059), Lado 20535 (MA-Fungi 83064), Lado 20545 (MA-Fungi 83073). ARG-09-61: *Astrocedrus chilensis* wood, Lado 20599 (MA-Fungi 83126), Lado 20600 (MA-Fungi 83127), Lado 20602 (MA-Fungi 83129). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21035 (MA-Fungi 83242). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21074 (MA-Fungi 86605). ARG-10-26: *Nothofagus pumilio* wood, Lado 21156 (MA-Fungi 83320). ARG-10-33: wood, Lado 21224 (MA-Fungi 83376). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21266 (MA-Fungi 83407), Lado 21269 (MA-Fungi 83410). ARG-11-11: *Nothofagus pumilio* wood, Lado 21361 (MA-Fungi 83460).

Trichia contorta (Ditmar) Rostaf.
ARG-09-03: leaves, Lado 20244 (MA-Fungi 82885), Lado 20253 (MA-Fungi 82893), Lado 20254 (MA-Fungi 82894), 20235 (MA-Fungi 82880). ARG-09-06: *Araucaria araucana* bark, Lado 20277 (MA-Fungi 82905), Lado 20283 (MA-Fungi 82911), Lado 20284 (MA-Fungi 82912); twigs, Lado 20287 (MA-Fungi 82914); Lado 20285 (MA-Fungi 82913). ARG-09-08: wood, Lado 20291 (MA-Fungi 82917); *Eryngium paniculatum* leaf base (mc, pH 6,2), dwb 3317. ARG-09-09: *Nothofagus* sp. wood, Lado 20293 (MA-Fungi 82919). ARG-09-20: *Populus* sp. log, Lado 20400 (MA-Fungi 82944). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20493 (MA-Fungi 83022), Lado 20499 (MA-Fungi 83029), Lado 20500 (MA-Fungi 83030). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20509 (MA-Fungi 83037). ARG-09-61: *Populus* sp. bark, Lado 20615 (MA-Fungi 83137); *Nothofagus dombeyii* wood, Lado 20565 (MA-Fungi 83095), Lado 20576 (MA-Fungi 83103); *Populus* sp. bark, Lado 20620 (MA-Fungi 86606). ARG-10-19: Mulinum *spinosum* twigs, Lado 21110 (MA-Fungi 83283). ARG-10-27: *Nothofagus*

pumilio wood, Lado 21167 (MA-Fungi 83329). ARG-10-37: *Mulinum spinosum* twigs, Lado 21293 (MA-Fungi 83432). ARG-11-17: *Nothofagus pumilio* wood, Lado 21405 (MA-Fungi 83498). ARG11-31: *Lepidophyllum cupressiforme* bark (mc, pH 6,5), dwb 3504; (mc, pH 6,6), dwb 3511.

The collections were from a number of varieties of this species. Collections Lado 20287, 20291, 20293, 21293 and 21110 were var. *attenuata* Meyl.; Lado 20620, 20235 and dwb 3511, 3504, 3317 were var. *iowensis* (T. Macbr.) Torrend. In addition collection Lado 20285 was var. *karstenii* (Rostaf.) Ing. The varieties *attenuata* and *iowensis* had not been reported previously from Argentina.

Trichia decipiens (Pers.) T. Macbr.
ARG-09-20: *Populus* sp. log, Lado 20402 (MA-Fungi 82946). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20417 (MA-Fungi 82954), Lado 20419 (MA-Fungi 82956), Lado 20422 (MA-Fungi 82960), Lado 20426 (MA-Fungi 82963), Lado 20430 (MA-Fungi 82967), Lado 20436 (MA-Fungi 82973). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20452 (MA-Fungi 82989), Lado 20455 (MA-Fungi 82992), Lado 20458 (MA-Fungi 82995), Lado 20465 (MA-Fungi 82999), Lado 20470 (MA-Fungi 83002). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20484 (MA-Fungi 83015), Lado 20485 (MA-Fungi 83016), Lado 20494 (MA-Fungi 83023). ARG-09-60: *Nothofagus dombeyii* wood, Lado 20513 (MA-Fungi 83041), Lado 20517 (MA-Fungi 83045), Lado 20520 (MA-Fungi 83048), Lado 20523 (MA-Fungi 83051), Lado 20527 (MA-Fungi 83055), Lado 20528 (MA-Fungi 83056), Lado 20529 (MA-Fungi 83057), Lado 20534 (MA-Fungi 83063), Lado 20536 (MA-Fungi 83065), Lado 20538 (MA-Fungi 83066), Lado 20539 (MA-Fungi 83067), Lado 20542 (MA-Fungi 83070), Lado 20544 (MA-Fungi 83072), Lado 20548 (MA-Fungi 83076). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20567 (MA-Fungi 83096), Lado 20582 (MA-Fungi 83110). ARG-09-67: *Nothofagus* sp. wood, Lado 20968 (MA-Fungi 83186), Lado 20970 (MA-Fungi 83187), Lado 20986 (MA-Fungi 83200), Lado 21000 (MA-Fungi 83214). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21022 (MA-Fungi 83233). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21053 (MA-Fungi 83254), Lado 21060 (MA-Fungi 83260), Lado 21067 (MA-Fungi 83265), Lado 21068 (MA-Fungi 83266). ARG-10-26: *Nothofagus pumilio* wood, Lado 21119 (MA-Fungi 83287), Lado 21126 (MA-Fungi 83292), Lado 21132 (MA-Fungi 83297), Lado 21150 (MA-Fungi 83314), Lado 21154 (MA-Fungi 83318), Lado 21137 (MA-Fungi 83302). ARG-10-27: *Nothofagus pumilio* wood, Lado 21157 (MA-Fungi 83322). ARG-10-31: *Nothofagus pumilio* wood, Lado 21204 (MA-Fungi 83360). ARG-10-33: wood, Lado 21220 (MA-Fungi 83373). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21270 (MA-Fungi 83411), Lado 21273 (MA-Fungi 83412. ARG-11-02: *Nothofagus antarctica* wood, Lado 21339 (MA-Fungi 83445). ARG-11-11: *Nothofagus pumilio* wood, Lado 21356 (MA-Fungi 86607), Lado 21358 (MA-Fungi 83457). ARG-11-13: *Nothofagus pumilio* wood, Lado 21381 (MA-Fungi 83479).

Collection Lado 21137 pertained to the variety *olivacea* Meyl.

° ***Trichia erecta*** Rex
ARG-09-68: *Nothofagus dombeyii* wood, Lado 21025 (MA-Fungi 83235).

In the Neotropics it has been previously reported from Mexico but this is the first record from South America.

Trichia favoginea (Batsch) Pers.
ARG-09-67: *Nothofagus* sp. wood; Lado 20985 (MA-Fungi 83199), Lado 20995 (MA-Fungi 83210), Lado 21007 (MA-Fungi 83221). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21017 (MA-Fungi 83229).

Trichia lutescens (Lister) Lister
ARG-09-02: *Eryngium paniculatum* leaves, Lado 20221 (MA-Fungi 82875). ARG-09-19: *Araucaria araucana* log, Lado 20399 (MA-Fungi 82943). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20420 (MA-Fungi 82958), Lado 20432 (MA-Fungi 82969). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20462 (MA-Fungi 82998). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20495 (MA-Fungi 83024), Lado 20496 (MA-Fungi 83026), Lado 20502 (MA-Fungi 83031). ARG-09-61: *Astrocedrus chilensi* bark, Lado 20644 (MA-Fungi 83161); wood, Lado 20637 (MA-Fungi 83154); *Nothofagus dombeyii* wood, Lado 20578 (MA-Fungi 83106), Lado 20589 (MA-Fungi 83118); *Populus* sp. wood, Lado 20617 (MA-Fungi 83139), Lado 20623 (MA-Fungi 83144). ARG-09-67: *Nothofagus* sp. wood, Lado 21003 (MA-Fungi 83217). ARG-10-26: *Nothofagus pumilio* wood, Lado 21135 (MA-Fungi 83300). ARG-10-27: *Nothofagus pumilio* wood, Lado 21173 (MA-Fungi 83335). ARG-10-30: *Nothofagus pumilio* wood, Lado 21183 (MA-Fungi 83344). ARG-10-31: *Nothofagus pumilio* wood, Lado 21197 (MA-Fungi 83355). ARG-10-33: wood, Lado 21217 (MA-Fungi 83371), Lado 21219 (MA-Fungi 83372), Lado 21223 (MA-Fungi 83375). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21291 (MA-Fungi 83430). ARG-11-11: *Nothofagus pumilio* wood, Lado 21363 (MA-Fungi 83462), Lado 21369 (MA-Fungi 83467). ARG-11-13: *Nothofagus pumilio* wood, Lado 21385 (MA-Fungi 83483).

Trichia scabra Rostaf.
ARG-10-33: wood, Lado 21221 (MA-Fungi 86608).

This collection is easily recognised by the reticulate spores. By SEM the reticulum is made up of non-pitted narrow muri (Fig. 12A), and the capillitial threads are decorated with 3-4 spiny spiral bands (Figs. 12B-12C), and the free ends have short points (Fig. 12B).

Trichia subfusca Rex
ARG-09-67: *Nothofagus* sp. wood, Lado 20969 (MA-Fungi 86609), Lado 20971 (MA-Fungi 86610).

Trichia varia (Pers. ex J.F. Gmel.) Pers.
ARG-09-06: *Araucaria araucana* bark, Lado 20280 (MA-Fungi 82908), Lado 20282 (MA-Fungi 82910); *Nothofagus* sp. wood, Lado 20310 (MA-Fungi 82933). ARG-09-20: *Populus* sp. log, Lado 20401 (MA-Fungi 82945). ARG-09-56: *Nothofagus dombeyii* wood, Lado 20415 (MA-Fungi 82952), Lado 20416 (MA-Fungi 82953), Lado 20423 (MA-Fungi 82961), Lado 20424 (MA-Fungi 82962), Lado 20427 (MA-Fungi 82965), Lado 20435 (MA-Fungi 82972), Lado 20438 (MA-Fungi 82975), Lado 20442 (MA-Fungi 82978), Lado 20443 (MA-Fungi 82979), Lado 20444 (MA-Fungi 82980), Lado 20447 (MA-Fungi 82983). ARG-09-57: *Nothofagus dombeyii* wood, Lado 20461 (MA-Fungi 82997), Lado 20468 (MA-Fungi 83000), Lado 20469 (MA-Fungi 83001). ARG-09-59: *Nothofagus dombeyii* wood, Lado 20497 (MA-Fungi 83027), Lado 20498 (MA-Fungi 83028), Lado 20503 (MA-Fungi 83032). ARG-09-61: wood, Lado 20632 (MA-Fungi 83151), Lado 20639 (MA-Fungi 83156); *Nothofagus dombeyii* wood, Lado 20553 (MA-Fungi 83081), Lado 20559 (MA-Fungi 83088), Lado 20563 (MA-Fungi 83093), Lado 20568 (MA-Fungi 83097). ARG-10-26: *Nothofagus pumilio* wood, Lado 21134 (MA-Fungi 83299). ARG-10-29: *Nothofagus pumilio* wood, Lado 21178 (MA-Fungi 83339), Lado 21179 (MA-Fungi 83340). ARG-10-31: *Nothofagus pumilio* wood, Lado 21195 (MA-Fungi 86611), Lado 21205 (MA-Fungi 83362), Lado 21207 (MA-Fungi 83363). ARG-10-32: *Austrocedrus chilensis* wood, Lado 21215 (MA-Fungi 83369). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21257 (MA-Fungi 83399), Lado 21259 (MA-Fungi 83401), Lado 21268 (MA-Fungi 83409), Lado 21277 (MA-Fungi 83416). ARG-10-36: *Nothofagus dombeyii*

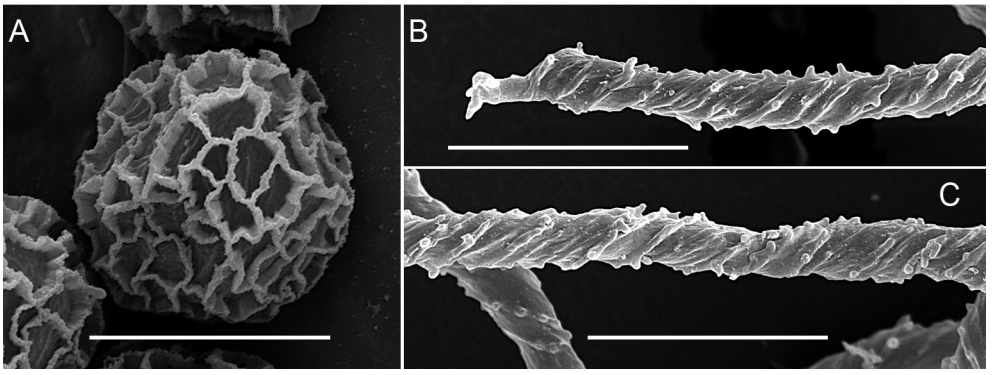

Fig. 12. *Trichia scabra* (Lado 21221) by SEM. **A.** Spore. **B-C.** Capillitium. Bar: A=10 µm; B-C=20 µm.

wood, Lado 21280 (MA-Fungi 83419), Lado 21290 (MA-Fungi 83429). ARG-11-04: *Nothofagus pumilio* wood, Lado 21352 (MA-Fungi 83455). ARG-11-11: *Nothofagus pumilio* wood, Lado 21369 (MA-Fungi 83466), Lado 21371 (MA-Fungi 83469). ARG-11-12: *Nothofagus pumilio* wood, Lado 21376 (MA-Fungi 83473). ARG-11-49: *Nothofagus pumilio* wood, Lado 21449 (MA-Fungi 83513).

Trichia verrucosa Berk.
ARG-09-60: *Nothofagus dombeyii* wood, Lado 20533 (MA-Fungi 83062). ARG-09-61: *Nothofagus dombeyii* wood, Lado 20555 (MA-Fungi 83083). ARG-09-67: *Nothofagus* sp. wood, Lado 20973 (MA-Fungi 83189), Lado 20975 (MA-Fungi 83190), Lado 20977 (MA-Fungi 83192), Lado 20978 (MA-Fungi 83193), Lado 20981 (MA-Fungi 83195), Lado 20987 (MA-Fungi 83202), Lado 20988 (MA-Fungi 83203), Lado 20992 (MA-Fungi 83207), Lado 20993 (MA-Fungi 83208), Lado 20994 (MA-Fungi 83209), Lado 20997 (MA-Fungi 83212), Lado 20999 (MA-Fungi 83213), Lado 21004 (MA-Fungi 83219), Lado 21011 (MA-Fungi 83225). ARG-09-68: *Nothofagus dombeyii* wood, Lado 21015 (MA-Fungi 83228), Lado 21019 (MA-Fungi 83230), Lado 21029 (MA-Fungi 83238), Lado 21049 (MA-Fungi 83250), Lado 21050 (MA-Fungi 83251). ARG-09-69: *Nothofagus dombeyii* wood, Lado 21081 (MA-Fungi 83276). ARG-10-26: *Nothofagus pumilio* wood, Lado 21128 (MA-Fungi 83293), Lado 21153 (MA-Fungi 83317). ARG-10-30: *Nothofagus pumilio* wood, Lado 21188 (MA-Fungi 83349). ARG-10-31: *Nothofagus pumilio* wood, Lado 21200 (MA-Fungi 83358). ARG-10-36: *Nothofagus dombeyii* wood, Lado 21288 (MA-Fungi 83427). ARG-11-02: *Nothofagus antarctica* wood, Lado 21341 (MA-Fungi 83446). ARG-11-12: *Nothofagus pumilio* wood, Lado 21375 (MA-Fungi 83472), Lado 21377 (MA-Fungi 83475), Lado 21379 (MA-Fungi 83477). ARG-11-13: *Nothofagus pumilio* wood, Lado 21383 (MA-Fungi 83481), Lado 21384 (MA-Fungi 83482), Lado 21391 (MA-Fungi 83489).

Tubifera ferruginosa (Batsch) J.F. Gmel.
ARG-10-26: *Nothofagus pumilio* wood, Lado 21136 (MA-Fungi 83301), Lado 21142 (MA-Fungi 83306), Lado 21143 (MA-Fungi 83307).

Willkommlangea reticulata (Alb. & Schwein.) Kuntze
ARG-09-56: *Nothofagus dombeyii* wood, Lado 20440 (MA-Fungi 82977). ARG-10-33: wood, Lado 21230 (MA-Fungi 83381). ARG-10-34: *Nothofagus dombeyii* wood, Lado 21234 (MA-Fungi 83383), Lado 21247 (MA-Fungi 83393), Lado 21240 (MA-Fungi 83388), Lado 21253 (MA-Fungi 83397). ARG-10-35: *Nothofagus dombeyii* wood, Lado 21261 (MA-Fungi 83402). ARG-11-02: *Nothofagus antarctica* wood, Lado 21346 (MA-Fungi 83451).

DISCUSSION

The 1134 collections obtained in this 3-year study include 133 species and 5 varieties from 31 genera. Of these myxomycetes, 820 specimens were collected fruiting naturally in the field and 314 were obtained from moist chamber cultures of substrates collected in the localities sampled. One species *Perichaena nigra* is described as new to science and 7 species and two varieties are new records for the entire Neotropical region. In addition, 10 species had not been reported from South America before this study, and 19 species more are new for the catalogue of Argentina. These 37 species bring the total number of myxomycete species reported from Argentina to 248. This number indicates that Argentina is, at present, the country in South America with the greatest number of myxomycetes catalogued, and has more than 50% of the species cited from the Neotropics (Lado & Wrigley de Basanta, 2008).

Nivicolous myxomycetes were collected in 6 collecting localities of the 174 in Table 1, and results from these are not included here, as they will form part of a future paper. Of the remaining 168 localities, almost 82% were positive since only 31 produced no myxomycetes. This indicates that these organisms are widely distributed and are a normal component of Patagonian biota.

All taxonomic orders were represented in these results (Table 2). It is interesting to note that in the Central province, the most abundant species are spread between the orders Physarales, Trichiales, Echinosteliales and Stemonitales, whereas in the Subandean province there is a very clear dominance of the order Trichiales. This was also the case in the previous study of subantarctic forest myxobiota (Wrigley de Basanta & al., 2010b), and in fact 70% of the species recorded in that paper have been found again and cited here up to 6 years later. Of particular note is the reappearance of the collections of the rare species of *Diderma* from this region, over several years and in different localities. The fact that these species have not been found anywhere else appears to support the fact that they are endemic species in this geographic area (Estrada -Torres & al., 2013).

The dominant genera in Patagonia Central province (Table 2) are *Didymium* (11 species), *Physarum* (10), *Perichaena* and *Badhamia* (7), *Echinostelium* and *Licea* (5) and the most abundant by number of collections are *Perichaena* (58), *Physarum* (58), *Echinostelium* (38), *Badhamia* (37) and *Didymium* (37). In the Subandean

Table 2. Summary of Results by Taxonomic Order.

Order	Genus	Central Province species collections		Subandean Province species collections		Total species	Species / order
Ceratiomyxales	*Ceratiomyxa*	0	0	1	12	1	
							1
Echinosteliales	*Echinostelium*	5	38	3	13	5	
							5
Liceales	*Cribraria*	0	0	7	17	7	
	Licea	5	12	1	4	6	
	Lycogala	0	0	1	10	1	
	Reticularia	0	0	3	20	3	
	Tubifera	0	0	1	3	1	
							18
Trichiales	*Calomyxa*	1	1	1	6	1	
	Dianema	1	1	2	5	3	
	Arcyria	2	8	9	29	9	
	Perichaena	7	58	6	53	9	
	Hemitrichia	1	1	2	8	2	
	Metatrichia	0	0	1	24	1	
	Oligonema	0	0	2	6	2	
	Trichia	1	2	11	273	11	
							38
Physarales	*Badhamia*	7	37	7	25	8	
	Fuligo	1	1	2	2	2	
	Leocarpus	0	0	1	7	1	
	Physarum	10	58	20	147	23	
	Protophysarum	1	1	0	0	1	
	Willkommlangea	0	0	1	8	1	
	Diderma	0	0	5	19	5	
	Didymium	11	37	9	59	14	
	Lepidoderma	0	0	2	46	2	
							57
Stemonitales	*Collaria*	0	0	1	1	1	
	Comatricha	1	13	2	25	2	
	Enerthenema	1	1	1	2	1	
	Lamproderma	0	0	1	1	1	
	Macbrideola	4	23	2	4	4	
	Stemonitis	0	0	4	13	4	
	Stemonitopsis	0	0	1	1	1	
							14
Total	31	59	291	110	843	133	133

province 8 of the 14 recognised genera in the taxonomic order Trichiales were collected, and the genus *Trichia*, with 11 species and 4 varieties was the most abundant in the whole province with a total of 273 collections. It is followed distantly by the genus *Physarum* (147 collections), even though this genus was represented by almost double the species (20 species). In contrast, in the Central province, only 2 species and 11 collections of the genus *Trichia* were obtained. The genus that appeared almost evenly in both provinces was *Perichaena*.

Among the results, 59 of the species (291 collections) were recovered from the Central province and 110 (843 collections) from the Subandean province (Table 3), 23 were found only in the Central province, 74 were only found in the Subandean province and 36 were common to both.

Using the species to genus (S/G) ratio as a diversity index, the whole area studied is not as diverse as other areas of the country (Table 3). The S/G ratio for the whole survey was 4.29, and since the lower the number, the more diverse the area, taxonomic diversity is greater in the Monte

Table 3. Summary data by biogeographic province (MC = in moist chamber culture).

		Total	Central province	Subandean province
Collections	Total	1134	291	843
	MC	314	230	84
	Field	820	61	759
Species		133	59	110
Genera		31	16	30
S/G ratio		4.29	3.69	3.67
Positive localities		137	57	80

Desert Argentina (3.27) or the value obtained (2.9) for the subantarctic forests of Argentina (Wrigley de Basanta & al., 2010b), and just within the range of values (2.2-4.6) reported for tropical and temperate forests (Stephenson & al., 1993). The Subandean province was slightly more diverse, and similar to the 3.79 of central Chile (Lado & al., 2013) and the Central province fell between the two.

In the localities that were positive for myxomycetes, either in the field or in subsequent moist chamber culture, 99 localities (72%) had predominantly steppe vegetation. Since the Subandean province is made up of transition steppe vegetation as well as forests, in terms of general vegetation, 43% of the total number of collections came from the steppe. When corrected for the number of positive collecting localities however, it can be seen that, not surprisingly, the forest vegetation localities were much more productive. One major factor in these differences was the paucity of wood in the steppe. The majority of the collections in forest vegetation were made on decomposing logs and branches of trees, whereas wood in steppe vegetation was confined to twigs from small woody bushes. An additional factor is the absence of litter in the steppe due to the constant wind. The single locality with the greatest number of collections was Lago Puelo. This was also the area where most collections were made by the same team in subantarctic forests (Wrigley de Basanta & al., 2010b), and seems to be a particularly favourable area for myxomycetes, probably because of the high rainfall coupled with the varied elements of vegetation. This National Park has valdivian temperate rainforest vegetation transitioning into southern beech forest and creates a unique environment with many species of plants from Chile on the other side of the cordillera.

The most representative species of the whole survey were *Perichaena vermicularis* with 61 collections, *Trichia affinis* (55), *Trichia decipiens* (54), *Lepidoderma trevelyanii* (45), *Trichia varia* (45), *Physarum notabile* (36), *Physarum leucophaeum* (34), *Trichia verrucosa* (34), *Didymium squamulosum* (30), *Badhamia dubia* (27), *Physarum album* (26) and *Trichia lutescens* (26). As is to be expected, the most abundant species in the field are characteristic myxobiota from the Subandean province whereas the most abundant species in moist chamber are from the Central province. In a study of cold deserts of Asia (Novozhilov & al., 2006), all of the results from the steppe, except one, also came from moist chamber cultures. It is interesting to note that only two species, *Perichaena vermicularis and Physarum leucophaeum* were among the most representative species in both provinces. The five most frequently found myxomycetes as field collections were *Perichaena vermicularis* (57), *Trichia affinis* (55), *Trichia decipiens* (54), *Lepidoderma trevelyanii* (45), *Trichia varia* (45). The most abundant species recovered from moist chamber cultures were *Physarum notabile* (34), *Echinostelium coelocephalum* (22), *Macbrideola argentea* (19), *Didymium dubium* (18), *Perichaena madagascariensis* (16).

The moist chamber cultures set up with substrates collected during this survey showed a relatively high productivity for such cold arid areas since they were 69% positive, that is they showed some evidence of the presence of myxomycete plasmodia or fruiting bodies. A total of 314 collections were made from almost 700 moist chamber cultures. This effort in culturing, since each culture is followed for 3 months, may appear great for such a return in numbers of collections, but 36 species only appeared in moist chamber cultures, underlining the benefits, especially in arid areas, of complementing fieldwork with these cultures. In the survey from the other side of the Andes in Chile (Lado & al., 2013), 65% of the moist chamber cultures were positive. These results are comparable to the productivity reported by Schnittler & al. (2013) from the arid Tarim Basin in China. Some of the positive cultures produced plasmodia that didn't fruit or that produced malformed specimens that were impossible to identify. The pH of the substrates used for positive moist chamber cultures ranged from 3.9 to 8.4. The vast majority of the collections however were made from substrates with a circumneutral pH, as has been the case in other studies (Lado & al., 2011; Wrigley de Basanta & al., 2013).

According to the estimators ACE and CHAO1, if the sampling effort of the whole survey had been exhaustive, the number of species to be expected would be 165 and 160, respectively (Fig. 13).

This indicates that the sampling effort of the present survey with 133 species recorded was 83-81% complete according to ACE and CHAO1, and a large number of the expected species in the total area studied were collected. These results are surprising, if the huge area studied and the extreme climatic conditions are taken into consideration. Examining the results by the two biogeographic provinces separately, however, the values returned are 132 and 131 expected species respectively for each of the estimators for the Subandean province, and 94 and 113 species for the Central province. These estimators show that the survey recovered 83.3 to 84.0%, and 52.2 to 62.8 % respectively in each province. This suggests a less than exhaustive survey for the Central province, but on account of the unfavorable conditions there were relatively few field collections (Table 3), and although an intensive study of diverse substrates was done by moist chamber culture, as mentioned above, many of these produced only plasmodia or unidentifiable specimens. Almost half the species from the Central province were only recorded with one collection, and this is also reflected in the estimators for this province.

According to the species accumulation curve using the adjustment by Clench (Fig. 14), the estimated number of species for the whole survey is 173 (r^2=0.997), so 76.9% of the potential myxobiota was recovered and that 40 further species could be found in future surveys of the whole area. As can been seen from the asymptotic curve, 61 additional collecting sites would be necessary even to produce another

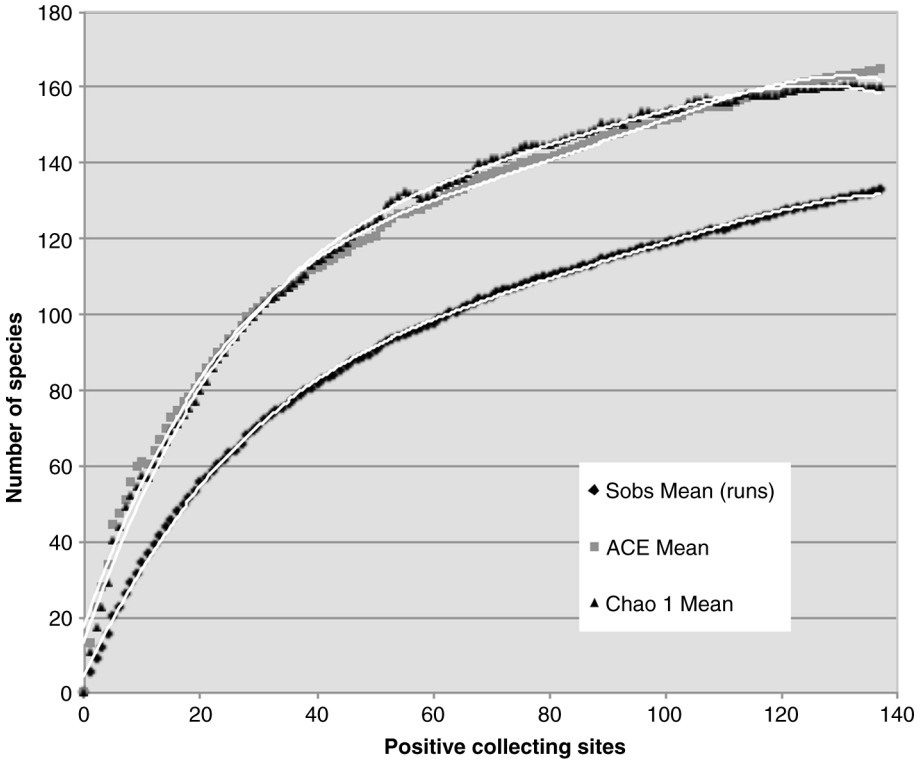

Fig. 13. Curves of abundance (ACE and CHAO1 estimators) compared to the species observed curves (Sobs) of this survey. White lines indicate the polynomial best-fit curve.

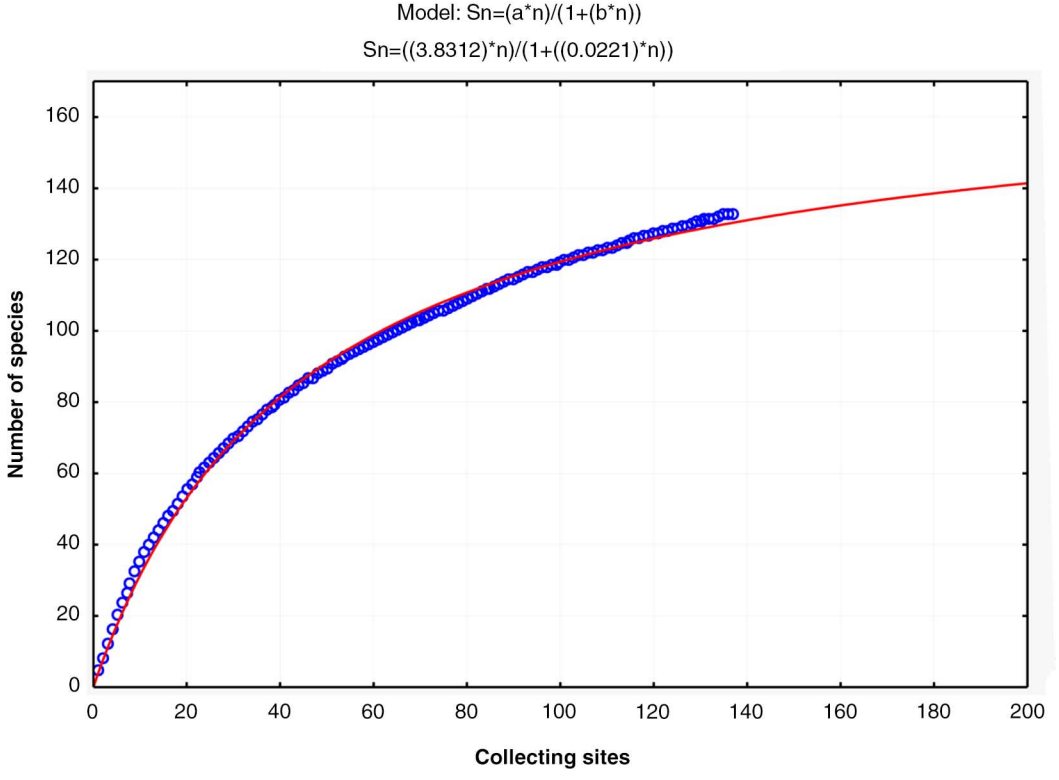

Fig. 14. Species accumulation curve using the adjustment by Clench.

8-10 more species, since the closer the number gets to the maximum expected, the more difficult it is to obtain new species under the same sampling conditions.

To compare the similarity in species composition between the results of this survey and the results of other surveys, a coefficient of community (CC) (Sørensen, 1948) was used

Table 4. Community simmilarity between myxobiota of areas in Argentina, Chile and Russia using the coefficient of community index (CC). (CC bottom left, number of species in common top right).

	Patagonia steppe	Subantarctic forests	Monte desert	Central Chile	Volga basin
Patagonia steppe (present study)	***	47	39	64	70
Subantarctic forests (Wrigley de Basanta & al., 2010b)	0.47	***	13	37	38
Monte desert (Lado & al., 2011)	0.38	0.19	***	40	38
Central Chile (Lado & al., 2013)	0.53	0.42	0.44	***	59
Volga basin (Novozhilov & al., 2006)	0.48	0.34	0.33	0.44	***

calculating pairwise combinations of the data in Table 4. The studies, in the Monte Desert of Argentina, and in Chile, from the Atacama Desert to the subantarctic forests, were made by the same team, using the same methodology. A further study in the Volga basin, Russia, with a similar environment of steppe and cold arid areas, was also used for comparison.

In South America, the most similar area in terms of species composition was central Chile with 64 species in common, followed by the subantarctic forests of Patagonia with a similarity coefficient of 0.47 (47 species in common), and the most dissimilar species composition was in the warm Monte desert in the North of Argentina with only 39 species in common. However even the similar areas had only around 50% similar species which is surprisingly low. Only 11 species (*Arcyria denudata, A. cinerea, Comatricha laxa, Echinostelium colliculosum, E. minutum, Lycogala epidendron, Perichaena depressa, Physarum leucophaeum, Trichia affinis, T. contorta* and *Willkomlangea reticulata*) appeared in all the three areas of Argentina studied as well as in Central Chile, and 43 species were only registered in this survey of the Patagonian Steppe and bordering areas and in none of the other surveys. Phenology of species could be a factor, but in the two areas that appear to be the most similar to this survey, both in CC and in terms of latitude, that of the subantarctic forests and that of central Chile, the collecting was done in the same season in different years so myxomycete phenology does not appear to be the reason for such unique species composition. It appears that the variety of myxomycete species in these intensive surveys completed by the authors, are indicative of a certain regional specialization of these organisms. This also held true when the results of the Patagonian steppe were compared to the extensive study of the cold arid areas in the Volga river basin in Russia (Novozhilov & al., 2006), where the coefficient of community similarity of the myxobiota was only 0.48 (Table 3), in spite of having the greatest number of species in common of all the areas compared. The Russian area studied included a steppe zone and desert zone, but the plant communities differed totally from those of the Patagonian Steppe, which is a possible reason for the variance. In addition in the Volga river basin study a large number of collections were made on litter. In Patagonia the constant wind prevents litter from accumulating as mentioned above. Community coefficient values between arid and semiarid areas reported by Novozhilov & al. (2006) showed greater community similarity between the areas they studied and the authors suggested that desert myxomycete biota have a high level of similarity. Based on the data herein, it would seem not to be the case, and whereas there may be some xerotolerant species common to many different arid areas, the whole assemblage of myxomycetes appears to depend more on the availability of plant substrate species than on the overall macroenvironmental factors. As pointed out by Lado & al. (2013), the restricted distribution of some species, such as the species of the genus *Diderma* found frequently in Patagonia and nowhere else, can not be attributed to precipitation, temperature, latitude or elevation alone.

This has been the first survey of such extensive area in South America, and has produced the largest body of information on the diversity, distribution and ecology of the myxomycetes from this part of the world to date. The surveys, over three consecutive years, have been substantially complete with more than 80% of the theoretical number of species recovered from this vast area, according to the estimators used. The results confirm that myxomycetes are abundant and varied in the Patagonian Steppe and have been found on many endemic plants, showing that they are a normal component of the flora of the area. Differences have been found between the assemblages of myxomycetes in the Patagonian Steppe and those of the steppe and desert survey in the Volga river basin in Russia. A number of the species recovered in these cold arid areas appear to be xerotolerant. Many of the collections showed slight variations from described species, which with future culture and molecular work, may well turn out to be distinct ecotypes or even separate species.

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