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Rhynchomeliola Speg., an old genus new to Argentina

María V. Bianchinotti [1, 2, *], Romina M. Sánchez [2] & Mario Rajchenberg [3]

[1] *LEBBAH-CERZOS. Edificio E-1, CCT BB (CONICET). Cmo. La Carrindanga km 7. B8000FWV Bahía Blanca, Argentina.*

[2] *Lab. Biología de Algas y Hongos. Dto. Biología, Bioquímica y Farmacia. Universidad Nacional del Sur. San Juan 670. B8000ICN Bahía Blanca, Argentina.*

[3] *Centro de Investigación y Extensión forestal Andino Patagónico (CIEFAP). Ruta 259 Km 4 –CC 14. (9200) Esquel, Chubut, Argentina.*

** Corresponding authors: vbianchi@uns.edu.ar*

Summary

Bianchinotti, M. V., R. M. Sánchez & M. Rajchenberg. 2012. *Rhynchomeliola* Speg., an old genus new to Argentina. *Kurtziana* 37 (1): 119-125.

During a survey of the micromycetes growing on native plants from the Patagonian Andean forests, two species of *Rhynchomeliola* Speg. were found: *R. lomatiae* S. Lee & Joanne E. Taylor growing on leaves of *Lomatia ferruginea* (Proteaceae), and *R. usteriana* (Speg.) Arx & Müller growing on bark of *Nothofagus pumilio* (Nothofagaceae). *Rhynchomeliola* is a small genus of long-necked, non stromatic, perithecial fungi which comprises nine species that are mostly tropical and foliicolous. In South America this genus was known only from Brazil. *Rhynchomeliola lomatiae* is recorded for the first time since its original description from herbarium material of *Lomatia polymorpha* in Australia. The finding of *R. usteriana* growing on bark is the first record of a *Rhynchomeliola* species on a lignified substrate and supports the rejection of the habit as a useful character to distinguish the genus from the morphologically akin *Rhynchostoma* P. Karst. Full descriptions and illustrations of the recorded species are provided along with those of the type materials of the species described by Spegazzini.

Key words: Ascomycota, perithecial fungi, *Lomatia*, *Nothofagus*, Patagonia.

Resumen

Bianchinotti, M. V., R. M. Sánchez & M. Rajchenberg. 2012. *Rhynchomeliola* Speg., un viejo género nuevo para Argentina. *Kurtziana* 37 (1): 119-125.

Al estudiar los micromicetes asociados a plantas nativas de los bosques andinopatagónicos, se coleccionaron ejemplares de dos especies de *Rhynchomeliola* Speg.: *R. lomatiae* S. Lee & Joanne E. Taylor creciendo sobre hojas de *Lomatia ferruginea* (Proteaceae), y *R. usteriana* (Speg.) Arx & Müller asociado a corteza de *Nothofagus pumilio* (Nothofagaceae). *Rhynchomeliola* es un género de posición incierta que reúne pocas especies, mayormente folícolas y tropicales, caracterizadas por poseer ascomas periteciales no estromáticos, de cuellos largos y delgados. En Sudamérica este género solo se conocía en Brasil, siendo esta la primera cita del mismo para Argentina. Asimismo este es el primer hallazgo de *R. lomatiae* desde su descripción original de material herborizado de *Lomatia polymorpha* proveniente de Australia. El descubrimiento de *R. usteriana* sobre corteza representa la primera descripción de una especie del género sobre un sustrato lignificado, y sustentaría el rechazo del hábito como carácter válido para distinguir *Rhynchomeliola* respecto del género afín *Rhynchostoma* P. Karst. Se proveen descripciones e ilustraciones completas de las especies encontradas, así como de los tipos de las especies descriptas por Spegazzini.

Palabras clave: Ascomycota, peritecios, *Lomatia*, *Nothofagus*, Patagonia.

Introduction

While studying microfungi growing on selected native plants from the Patagonian Andes forests of southern Argentina and Chile, two small ascomycetes were found. They were identified as species of *Rhynchomeliola*, a genus introduced by Spegazzini in 1884 for a small fungus with long-necked perithecia, cylindrical asci and two-celled, light brown ascospores. Nowadays the genus comprises nine species, mostly foliicolous and of tropical distribution. They have been reported from Australia, Brazil, Canada, Costa Rica and Papua New Guinea (Marincowitz & Barr, 2007), and this is the first report of the genus from Argentina and Chile. Ascospores features like shape, size and surface are the main characters used to differentiate species. We noticed that descriptions of ascospores provided in the literature were ambiguous for the type species, so herein we provide full descriptions and illustrations of the recently collected materials and also of the type species described by Spegazzini.

Material and methods

Fresh materials were air dried. Sections were hand-made with a razor blade and were mounted in tap water or in 5% KOH with phloxine. Herbarium materials were rehydrated in tap water. All measurements were made in water. Herbaria abbreviations follow Holmgren et al. (1990).

Results

RHYNCHOMELIOLA Speg., *An. Soc. Cient. Argent*. 18: 284. 1884. Type species: *R. pulchella* Speg.

Rhynchomeliola pulchella Speg., *An. Soc. Cient. Argent*. 18: 284. 1884. TYPUS: Paraguay, Caa-guazú, Spegazzini 147 (holotype, LPS!). **Figs. 1-7.**

Ascomata non-stromatic, perithecioid, superficial among trichomes, with the base slightly immersed, separate, gregarious, venter globose to subglobose, 180 x 200 µm, with an ostiolar neck. Neck formed by longitudinally angular cells, central, single, cylindrical, up 800 µm long, ca. 30 µm wide at the base, tapering toward the apex so it is narrower in the median part (ca. 22 µm) and then enlarging again,up to ca. 33 µm wide. Peridium thin, cells disposed in *textura angularis*. Paraphyses not seen. Asci unitunicate, 8-spored, cylindrical claviform, wall simple, thin. Ascospores hyaline when young, then olive brown, 1-septate, minutely echinulate, 7-8 x 2.5-3 µm.

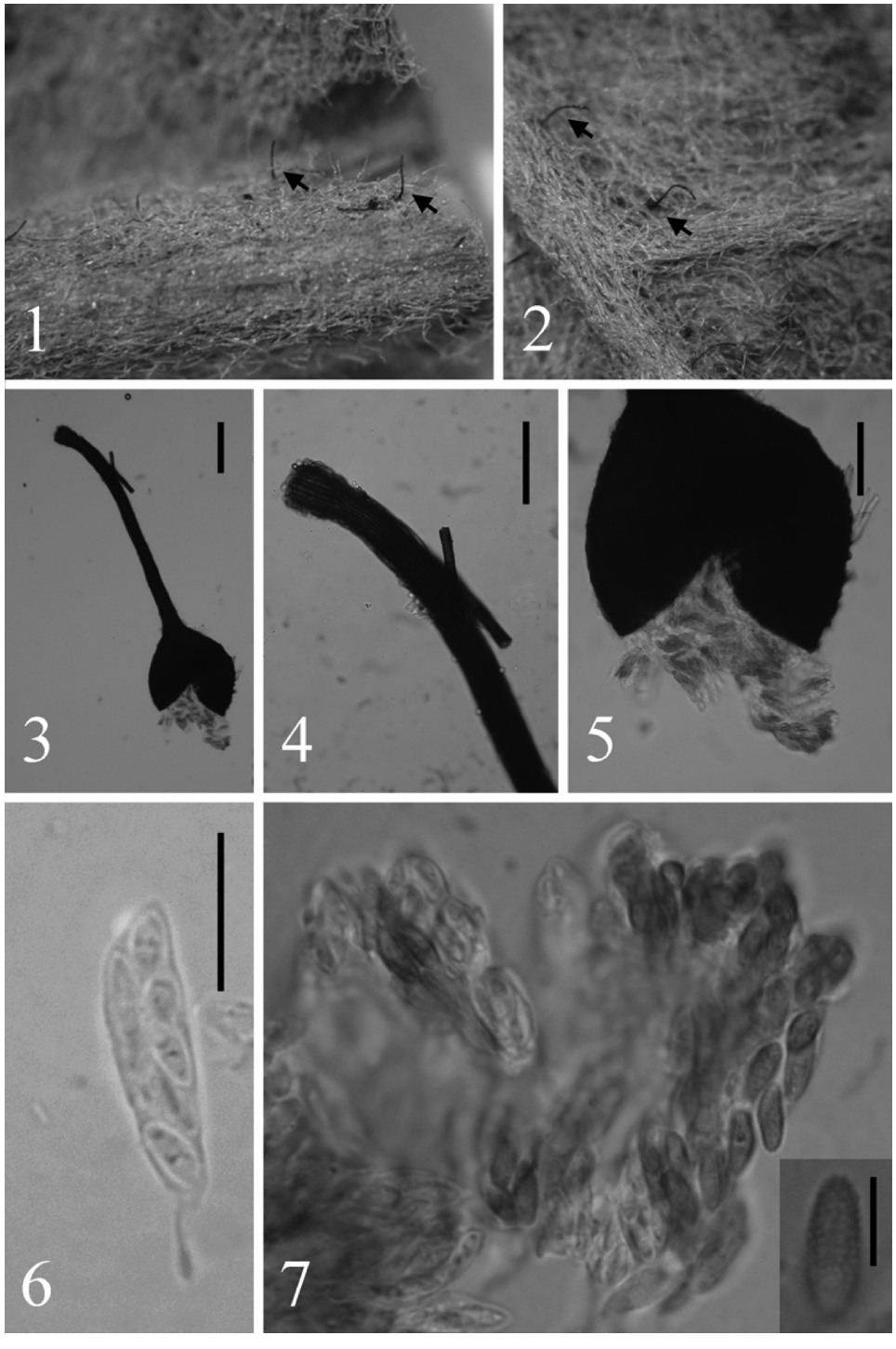
Studied material: PARAGUAY. **Caa-guazú**. Leg. B. Balansa nro. 3472, I-1882. "S/ *Feijoa selloviana*" (LPS 147).

Habitat and geographical distribution: On leaves of *Acca sellowiana* (O. Berg.) Burret (Myrtaceae). South America, Paraguay. Known only from the type locality.

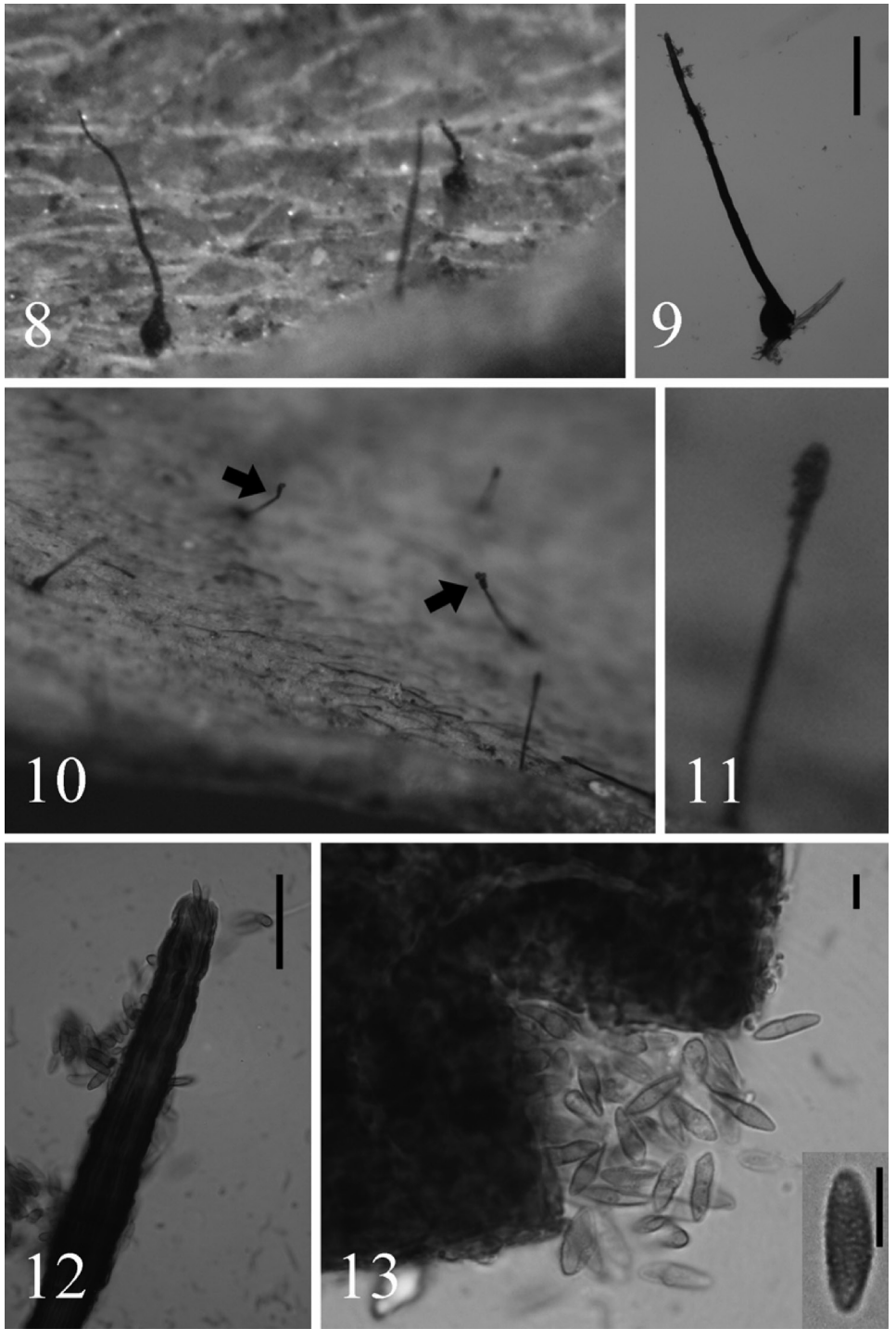
Comments: In the original description, Spegazzini (1884) did not mention anything on the ascospores ornamentation but illustrated them as smooth on the original envelope (ornamented spores drawn on this envelope do not pertain to this taxon but to an unrelated anamorph). Müller and Arx (1962) reexamined the type material and also described them as smooth, and Marincowitz and Barr (2007) considered them to be striated. We did not observe striations in ascospores from the holotype, instead we noted small spines, irregularly arranged (Fig. 7, insert).

Rhynchomeliola lomatiae S. Lee & Joanne E. Taylor. *Mycologia* 95: 905. 2003. TYPUS: Australia, Tasmania (holotype, BPI). **Figs. 8-13**.

Ascomata non-stromatic, perithecioid, superficial among trichomes, with the base slightly immersed, separate, gregarious, venter globose to subglobose, up to 100 µm high and 85 µm wide, with an ostiolar neck. Neck central, single, cylindrical, tapering toward the apex, up 800 µm long, 25-40 µm wide at the base and up to 15 µm wide at the apex, formed by longitudinally angular cells. Peridium thin, cells disposed in *textura angularis*. Paraphyses not seen. Asci not seen. Ascospores light brown to brown, 0-1 septate, ellipsoidal, tapered to the ends, constricted at the septum, verruculose, 8-11 x 2-3 µm.



Figs. 1-7. *Rhynchomeliola pulchella* (HOLOTYPE, LPS 147). 1-2. Perithecia on host surface (arrows). 3. Perithecium squashed on a slide mount. 4. Detail of perithecial neck. 5. Enlarged venter. 6. Ascus with inmature ascospores. 7. Mature asci with ascospores and ascospore showing echinulate ornamentation (insert). Scale bars: 3 = 100 µm, 4-5 = 50 µm, 6 = 10 µm, 7 = 5 µm.



Figs. 8-13. *Rhynchomeliola lomatiae* (BBB 429: 8, 9, 13; MR 12382: 10-12). 8. Perithecia on host surface. 9. Perithecium on a slide mount. 10. Mature perithecia with extruded ascospores (arrows). 11. Mass of ascospores on top of a perithecial neck. 12. Detail of neck. 13. Squashed venter showing mature, 1-septate ascospores and detail of ascospore ornamentation (insert). Scale bars: 9 = 200 µm, 12 = 25 µm, 13 = 5 µm.

Studied material: CHILE, **Región X Los Lagos**, *Prov*. *Palena*: Parque Pumalín, M. Rajchenberg 12379, 5-IV-2011. "Vegetation around the ranger headquarters, on living fronde" (BBB). *Prov*. *Palena*: Parque Pumalín, pathway to Cascada Escondida, comm. R.I. Pérez López (MR 12382), 5-IV-2011. "On fallen leaves" (BBB).

ARGENTINA. **Prov. Río Negro**: *Parque Nacional Nahuel Huapi*, Puerto Blest, M. Rajchenberg, V. Bianchinotti & R. Sánchez 410, 429, 431, 7-V-2007. "Road to Lago Frías" (BBB). *Parque Nacional Nahuel Huapi*, Puerto Blest, R. Sánchez 739-744, 15-I-2009. "Road to Los Cántaros. "On standing trees" (BBB). **Prov. del Chubut**: *Parque Nacional Los Alerces* Brazo Norte del Lago Menéndez, Camino del Alerzal, M. Rajchenberg & V. Bianchinotti 810-816, V-2009. "On fallen leaves" (BBB), *ibid*. 817-823, V-2009. "On standing trees" (BBB). *Parque Nacional Los Alerces*, Brazo Sur del Lago Menéndez, M. Rajchenberg 307-310, 3-V-2010. "Living fronde" (BBB).

Habitat and geographical distribution: On leaves of *Lomatia polymorpha* R. Br. and *L. ferruginea* (Cav.) R. Br. (Proteaceae). Australia (Tasmania) and South America (Argentina).

Comments: We could not find immature asci in our materials. This is the first record of the species since its description by Lee et al. (2003). Previously it was known only from herbarium material. *Rhyncomeliola australiensis* (Petr.) E. Müll., another species described on a Proteaceae plant, differs by wider, obliquely striated ascospores (Lee et al., 2003).

Rhynchomeliola usteriana (Speg.) Arx & E. Müll., *Beitr. Kryptfl. Schweiz* 11: 593. 1962. *Ceratostoma (?) usterianum* Speg., *Rev. Museo La Plata* 15: 18. 1908. TYPUS: Brazil, Ipiranga, Spegazzini 7057 (holotypus, LPS!). **Figs. 14-18**

Ascomata perithecioid, non-stromatic, superficial on a scanty subiculum, separate, venter globose, 88–150 µm diam., with an ostiolar neck. Neck central, single, cylindrical, tapering toward the apex, 190–950 µm long, 30-50 µm wide at the base and 15-35 µm wide at the apex, formed by cylindrical cells, 2-3 µm diam. Subiculum scanty, hyphae dark brown, ca. 7 µm diam. Peridium thin, cells disposed in *textura epidermoidea*. Paraphyses hyaline, filamentous, septate at the base, 2-3 µm diam. Asci unitunicate, cylindrical, 8-sporate. Ascospores uniseriate, ellipsoidal to navicular, 1-septate, slightly constricted at the septum, minutely verruculose, light brown to brown, (11-) 12-16(-18) × (3.5-)4-6(-8) µm.

Studied material: BRAZIL. **Ipiranga**: Cambucy, Usterius 83, IX-1905. "*Ceratostoma usterianum*. S/Myrtaceae?" (LPS 7057).

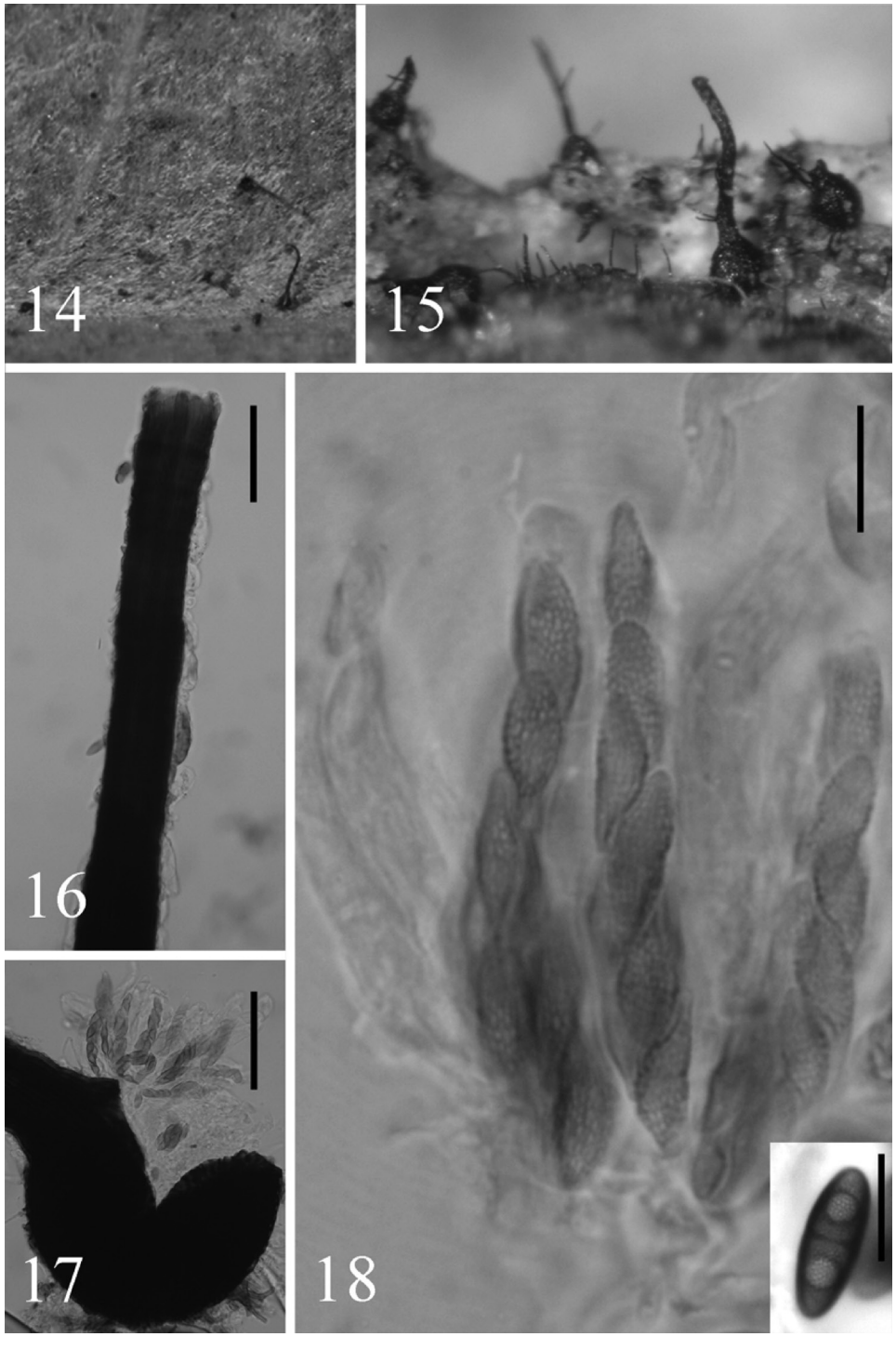
ARGENTINA. **Chubut**: Esquel: "Aserradero Pelech Hnos.", V. Bianchinotti 73, 8-V-2004. "Logs of *Nothofagus pumilio*" (BBB).

Habitat and geographical distribution: On coriaceous leaves of an unidentified Myrtaceae and on bark of *Nothofagus pumilio*. Argentina, Brazil.

Comments: The material on *Nothofagus* agrees well with the type collection, only differing in longer ascomatal necks and darker and slightly wider ascospores when compared with the original description (up to 400 µm and up to 5.5 µm, respectively). From the species described in *Rhynchomeliola*, *R. usteriana* possess the longest ascospores, i.e. up to 18 µm long.

Discussion

Rhynchomeliola species are regarded as southern, tropical fungi, with just one species described from temperate zones of the Northern Hemisphere (Marincowitz & Barr, 2007). Our records expand the known geographical distribution of the genus. *Rhynchomeliola* shares several morphological features with *Rhynchostoma* P. Karst., whose species are described as lignicolous or corticolous. In fact, both genera were erected independently for ascomycetes with long-neck perithecia, unitunicate, persistent asci and bicellular brown ascospores, and besides the habit, they were segregated on the basis of the presence or absence of stromata. The habit seems to be



Figs. 14-18. *Rhynchomeliola usteriana* (HOLOTYPE, LPS 7057: 14, 16-18; BBB 73: 15, 18 insert). 14. Perithecia on leaves. 15. Appearance of perithecia on bark. 16. Neck. 17. Squashed venter. 18. Asci and mature ascospore (insert). Scale bars: 16-17 = 50 µm, 18 = 10 µm.

a poor character to distinguish both genera, because of the description of *Rhynchomeliola quercina* Marinc. & M.E. Barron on bud scales (Marincowitz & Barr, 2007) and our finding of *R. usteriana* on *Nothofagus* bark. Both genera are almost identical morphologically, so the stroma seems to be the only useful character to separate them, being *Rhynchostoma* species superficial or immersed in stromatic tissue (Lee et al., 2003). The hierarchical placement of both genera is still uncertain (Lee et al., 2003). Through phylogenetic analyses, Lee et al. (2003) placed *Rhynchostoma* as a sister clade to the Chaetothyriales but all the attempts, including ours, to culture any *Rhynchomeliola* species have failed, so its phylogenetic status based on molecular methods could not be investigated and it is difficult to ascertain the familiar placement of *Rhynchomeliola* and its relationship with *Rhynchostoma*. Few observations have been done regarding the biology of the species of both genera. Lee et al. (2003) described a putative mechanism of insect-mediated ascospores dispersion in *Rhynchostoma proteae* S. Lee & Crous, a species that grows on flowerheads. We observed a similar behavior for the first time in a *Rhynchomeliola* species; the ascospores of *R. lomatiae* are extruded and then joined together at the tip or around the ostiolar neck (Figs. 10-11). Although we have examined a great number of collections, we never observed intact asci in this species, so we speculate (it is possible) that asci are early evanescent; the loss of forcible spore discharge, along with sticky ascospores and long-necked perithecia are features shared by ascomycetes with spore dispersal mediated by insects (Cassar & Blackwell, 1996).

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