

## ***Cryptosporiopsis lomati* sp. nov. on *Lomatia hirsuta* from southern Argentina**

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M. V. Bianchinotti, P. W. Crous & M. Rajchenberg (2002). *Cryptosporiopsis lomati* sp. nov. on *Lomatia hirsuta* from southern Argentina. – *Sydowia* 54(1): 1–8.

*Cryptosporiopsis lomati* sp. nov. (coelomycetes) is described on *Lomatia hirsuta* from southern Argentina. It is characterized by large, ellipsoid, fusiform to irregular conidia, pulvinate, acervular conidiomata, with branched, dense conidiophores that give rise to apical or lateral conidiogenous cells with periclinal thickenings. It is associated with spots and blackened areas on attached and/or fallen leaves.

Keywords: *Cryptosporiopsis*, Proteaceae, Patagonia, foliicolous pathogen, systematics.

During a survey of foliar pathogens associated with native plants from the Patagonian Andes forests of Argentina (Cabrera & Willink, 1980), infected leaves of *Lomatia hirsuta* (Lam.) Diels. ex Macbr. (Proteaceae) were collected by one of us. Although the interest in pathogens associated with cultivated members of the Proteaceae has recently increased (Swart & al., 1998; Taylor & Crous, 1998; Crous & Palm, 1999; Crous & al., 2000; Taylor & Crous, 2000), the knowledge of fungi associated with Proteaceae in southern South America is still extremely poor. Four genera in the family are represented in Patagonia, namely *Embothrium* J. R. Forst. & G. Forst., *Gevuina* Molina, *Lomatia* R. Br. and *Orites* R. Br. (Xifreda & Sanso, 1999). References of foliar fungi on these hosts are scant (Viégas, 1961; Mujica & Vergara, 1980; <http://nt.ars-grin.gov/fungalatabases>). *Phyllactinia antarctica* Speg. (*Erysiphales*) (Spegazzini, 1887) is a well-known parasite on *Embothrium coccineum* J. R. Forst. &

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G. Forst. (Havrylenko, 1998) and Spegazzini (1910; 1923) described a few coelomycetes from *Proteaceae* in South America, namely *Gloeosporium guevinae*, *Macrophoma guevinae* and *Phoma guevinae* on *Gevuina avellana* Mol., as well as *Phoma leptospora* and *Phoma lomatieae* on *Lomatia hirsuta*.

*Lomatia hirsuta* is a shrubby to small tree species that rarely develops into a large dominant tree; it may form pure stands in open areas or grow under pure or mixed *Austrocedrus chilensis* (D. Don.) Flor. & Boutl. and *Nothofagus dombeyi* (Mirb.) Oerst. forests.

The symptomatic leaves of *L. hirsuta* collected in the present study were consistently associated with a fungus that formed acervuli on the necrotic tissue. The latter turned out to represent an undescribed coelomycete, which is here proposed as a new species of *Cryptosporiopsis* Bubák & Kabát.

### Material and methods

For microscopic examinations the fungus was mounted in water or 5% KOH and measurements were made at 1000× magnification. 95% confidence intervals (CI) of the conidial measurements were derived from at least 25 observations and are reported in the descriptions expressed as ranges, with the extremes given in parentheses. Attempts to culture the fungus on a variety of media proved unsuccessful.

### Taxonomy

***Cryptosporiopsis lomati*** Bianchin. & Crous, **sp. nov.** – Figs. 1–2.

Maculae circulares vel irregulares, morbescentes, centro eburneae et margine atrorufae vel fuligineae. Conidiomata stromatica, amphigena, subcuticularia, pulvinata, immersa vel erumpentia, non ostiolata, primo cuticula tecta demum erumpentia, dehiscentia irregulari, 100–400 µm diam. et 250–500 µm lata. Peridium crassum ad complexum, duobus stratis compositum, strato exteriori textura epidermoidea, crassitunicata, interiore pallidiore, textura porrecta. Conidiophora hyalina, filiformia, laevia, simplicia vel ramosa, septata, (15–)22.5–30.5(–45) × (3–)4–4.5(–5) µm. Cellulae conidiogenae hyalinae, laeves, cylindricae vel doliiformes, rectae vel parum curvatae, apices versus attenuatae, discretae vel integratae, indeterminatae, (11–)18–20(–30) × (4–)4.5–5(–7) µm. Conidia blastica, enterogena, hyalina, laevia, anguste ellipsoidea vel fusiformia, recta, curvata vel irregularia, aseptata, guttulata, (21–)35–38(–44) × (5–)6.5–7(–10) µm. Holotypus BBB.

Leaf spots circular, irregular or angular, 4.5–15 mm diam., amphigenous, corky, separate, becoming confluent, pale brown, surrounded by a dark reddish brown to blackish margin of variable width that may be diffuse or delimited by a light brown border. – Conidiomata amphigenous, eustromatic, subcuticular,

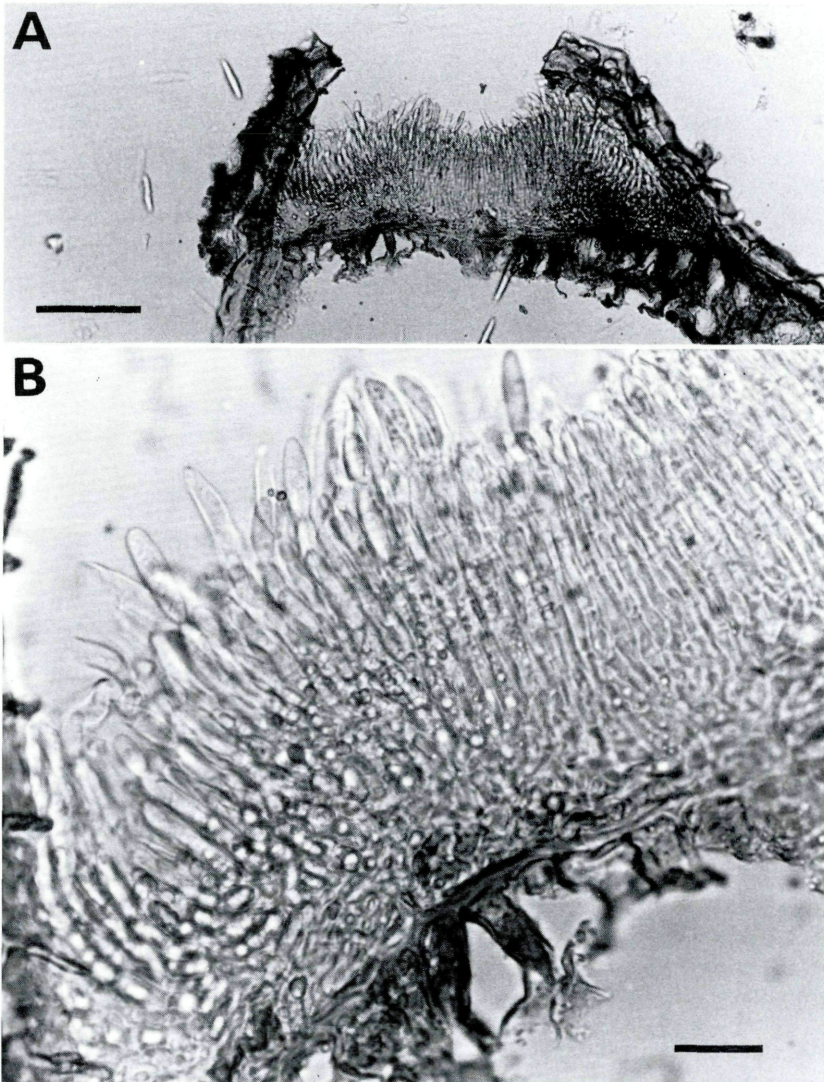


Fig. 1. – *Cryptosporiopsis lomati*. – A. Vertical section through a conidioma. – B. Detail of conidiomatal wall and conidiogenous cells. – Bars: A = 100 µm, B = 20 µm.

pulvinate, elliptical to irregular in outline, unilocular, pale grey to cream or pale brown, 100–400 diam., 250–500 µm long, 150–400 µm high; ostiole absent, dehiscence by one to several irregular (sometimes stellate) rupture(s) of the discolored cuticula. – Peridium thick, complex, comprising two strata; outer stratum composed of thick-walled light grey to concolorous *textura epidermoidea*, 15–30 µm wide, inner stratum composed of thin-walled, hyaline *textura por-*



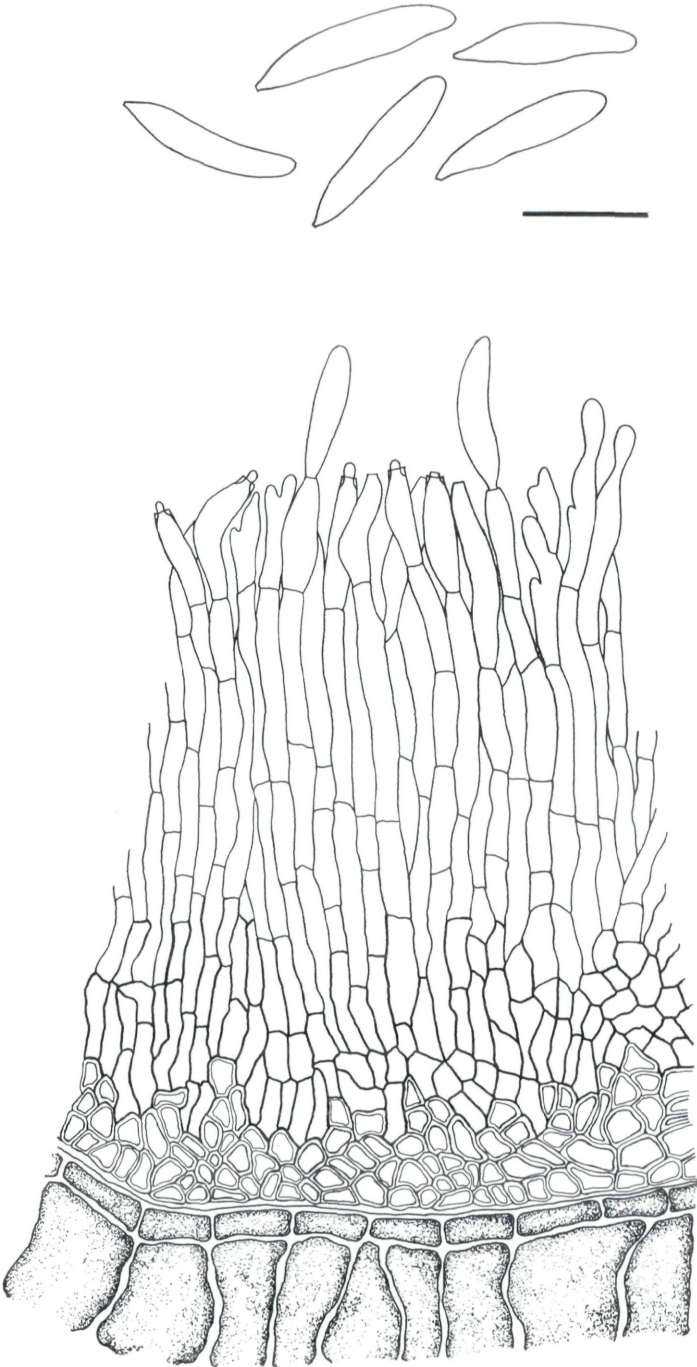


Fig. 2. - Conidiophores and conidia of *Cryptosporiopsis lomati*. - Bar = 20  $\mu$ m.

*recta*, 30–60 µm wide. – Conidiophores basal in conidioma, hyaline, dense, simple or branched at the base and frequently along their length, septate, arising from the upper cells of the inner stratum, smooth, straight or flexuous, (15–)22.5–30.5(–45) × (3–)4–4.5(–5) µm. – Conidiogenous cells hyaline, smooth, cylindrical to doliiform, straight or curved, slightly attenuated at the apex, discrete at the edge of the fructification, becoming predominantly integrated on septate conidiophores towards the centre, conidiogenous loci stationary, occurring apical or lateral just below septa, collarette and channel minute, periclinal wall thickened, secession schizolytic, (11–)18–20(–30) × (4–)4.5–5(–7) µm. – Conidia blastic, enterogenous, hyaline, smooth, aseptate, guttulate, almost clavate with rounded apices when immature, becoming more elongated, ellipsoid to fusiform, straight or curved to irregular at maturity, with an obtuse apex, and a base that tapers to a small scar, (21–)35–38.5(–44) × (5–)6.5–7(–10) µm. – Microconidial state not observed. – Teleomorph not known.

**Distribution.** – Southern Argentina, following the distribution of its host, *L. hirsuta*. Possibly also present in southern Chile on the same host.

**Types.** – Argentina, Chubut, Parque Nacional Los Alerces, Lago Futalaufquen, ca. Pucon-Pai hostelry, on leaves of two adjacent *L. hirsuta* trees in a mixed forest of *Austrocedrus chilensis* and *Nothofagus dombeyi*, leg. M. Rajchenberg 12069, 23 Oct. 2000, BBB (holotype), isotypes deposited in BAFC, BPI (747881), DAOM (229358), LPS and PREM.

**Additional specimens examined.** – Argentina, Río Negro, El Bolsón, circuito Mallín Ahogado, cuartel El Guadal, on living leaves of *L. hirsuta* under *A. chilensis*, leg. M. Rajchenberg, Dec. 1999, BBB; Chubut, Parque Nacional Los Alerces, Río Grande, settlement of Mr. Burgos, on living leaves of *L. hirsuta* in *A. chilensis* forest, leg. M. Rajchenberg 12061, 12063 and 12064, 17 Oct. 2000, BBB; *Ibid.*, on fallen leaves on soil, leg. *ipse* 12062 and 12065, BBB; Lago Futalaufquen, ca. Pucon-Pai hostel, on living leaves of *L. hirsuta* in a mixed forest of *Austrocedrus chilensis* and *Nothofagus dombeyi*, leg. M. Rajchenberg 12068, 23 Oct. 2000, BAFC, BBB, BPI (747880), DAOM (229357), LPS; Río Arrayanes, ca. the ranger's sectional headquarters, leg. M. Rajchenberg 11947, 8 Oct. 1999, BBB; Futaleufú, Los Cipreses, in *Austrocedrus chilensis* forest, leg. M. Rajchenberg 12050, 22 Aug. 2000, BBB; Río Negro, Parque Nacional Nahuel Huapi, near Llao-Llao (Soria Moria), leg. M. Havrylenko MH 2711, 11 Mar. 1994, BBB; Brazo Machete, leg. M. Havrylenko, 20 Apr. 1998, BBB.

## Discussion

When describing a fungus in the suborder *Phialostromatineae* Sutton (*Cryptocline-Cryptosporiopsis* complex), one is faced with considerable difficulties in trying to delimit the various genera. While most of the old literature placed emphasis on conidiomatal

morphology, little attention was paid to the structure of the conidiogenous cells and conidium ontogeny (Morgan-Jones, 1971), two features that were stressed as important by Sutton (1980).

Several genera were considered for the new species occurring on *Lomatia*. *Cryptocline* Petrak has a similar habit to the *Lomatia* fungus but it lacks a basal stroma, and has hyaline to pale brown conidia that are cylindrical to doliiform or ellipsoid, with a broad, flat base. It was considered to be heterogeneous by Sutton (1980). Our fungus has some characters similar to *Discula* Sacc., especially the conidiomata. However it differs because of the elongate, septate conidiophores and the conidiogenous loci near the septa, as well as at the apex. In *Discula* conidiophores are septate and branched basally, conidiogenous cells are determinate, and conidia are ellipsoid or clavate with an obtuse to more or less truncate base. The *Lomatia* fungus was also compared with *Gloeosporidiella* Petrak, which also contains several foliar pathogens. This genus, however, is known to have determinate conidiogenous cells with wide apices and falcate conidia with obtuse apices and truncate bases.

*Cryptosporiopsis* Bubák & Kabát represents a genus closely related to *Cryptocline*, but with well-developed fructifications (Arx, 1957). Known species occur mainly on aerial plant parts, namely branches, trunks, and leaves (Sankaran & al., 1995). Conidiophores have been reported to be reduced to conidiogenous cells, or to be branched when present (Groves, 1939; Arx, 1957; Verkley, 1999). Conidiogenous cells can be determinate or indeterminate, and conidia are ellipsoid to fusiform, straight or curved with an obtuse apex and the base tapered to a scar. The close resemblance in conidiogenesis and conidium morphology led us to consider our species better placed in this genus.

Species delimitation in *Cryptosporiopsis* is by a combination of differences in conidiomatal structure, conidial morphology and size, and host genus or family (Sankaran & al., 1995). Twenty species of *Cryptosporiopsis* are recognized as the anamorphs of *Pezicula* Tul. & C. Tul. and *Neofabraea* H. S. Jacks. and seven additional species with no known teleomorph are accepted (Verkley, 1999). *Cryptosporiopsis lomati* can be easily distinguished from the other two species in the genus that form conidiomata in necrotic spots of living leaves. *Cryptosporiopsis citri* P. R. Johnston & R. A. Fullerton forms eustromatic conidiomata with discrete conidiogenous cells and relatively small ellipsoid conidia ( $9\text{--}13.5 \times 4\text{--}5.5 \mu\text{m}$ ) and *C. eucalypti* Sankaran & B. Sutton has stromatic, pycnidial to acervular conidiomata, discrete conidiogenous cells and smaller, thick-walled conidia ( $11\text{--}20 \times 4.5\text{--}8 \mu\text{m}$ ) (Sankaran & al., 1995; Verkley, 1999). *Cryptosporiopsis lomati* can further be distin-



guished from other species in the genus based on its habit, conidial dimensions, and determinate conidiogenous cells (Dugan & al., 1993; Verkley, 1999).

### Acknowledgments

Dr. María Havrylenko (CRUB-Argentina) is warmly thanked for contributing some of the specimens examined in this study. MVB and MR are members of CONICET, the National Research Council of Argentina.

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*(Manuscript accepted 3<sup>rd</sup> December 2001)*



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Autor(en)/Author(s): Bianchinotti Maria, Crous Pedro W., Rajchenberg Mario

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