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E. ABREO, S. LUPO & L. BETTUCCI Fungal community of grapevine trunk diseases: a continuum of symptoms?	1	M. E. LÓPEZ DE SILANES, G. PAZ-BERMÚDEZ, R. CARBALLAL & J. MARQUES The genus <i>Leptogium</i> (Collemaaceae, Ascomycotina) in mainland Portugal	67
M. I. E. ARABI & M. JAWHAR The use of <i>Cochliobolus sativus</i> culture filtrates to evaluate barley resistance to spot blotch	13	H.-X. MA, L. N. VASILYEVA & Y. LI Two new species of <i>Hypoxylon</i> from China	103
P. DELIVORIAS, Z. GONOU-ZAGOU & E. KAPSANAKI-GOTSI A new species of <i>Guepiniopsis</i> (Dacrymycetes) from Greece	19	S. A. B. MACABAGO, T. E. E. DELA CRUZ & S. L. STEPHENSON First records of myxomycetes from Lubang Island, Occidental Mindoro, Philippines .	109
S. P. GORJÓN, A. G. GRESLEBIN & M. RAJCHENBERG The genus <i>Athelopsis</i> (<i>Atheliales</i> , <i>Basidiomycota</i>) in the Patagonian Andes	29	M. M. STECIOW & A. V. MARANO Southernmost occurrence of two species of <i>Monoblepharis</i> (<i>Monoblepharidomycetes</i> , <i>Chytridiomycota</i>) in America	119
N. KLOMKLUNG, S. C. KARUNARATHNA, E. CHUKEATIROTE & K. D. HYDE Domestication of wild strain of <i>Pleurotus giganteus</i>	39	H. Y. WU, D. G. KIM, Y. H. RYU & X. B. ZHOU <i>Arthrobotrys koreensis</i> , a new nematode-trapping species from Korea	129
X.-Y. LIU, Y.-N. WANG & R.-Y. ZHENG Molecular phylogeny of <i>Pilaira</i> (<i>Mucorales</i> , <i>Zygomycetes</i>) inferred from ITS rDNA and <i>pyrG</i> sequences	55	H. S. YUAN, Y. C. DAI & S. H. WU Two new species of <i>Junghuhnia</i> (<i>Polyporales</i>) from Taiwan and a key to all species known worldwide of the genus	137
		Book Review	147
		Taxonomic novelties in <i>Sydowia</i> 64 (1) 2012	148

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The genus *Athelopsis* (*Atheliales*, *Basidiomycota*) in the Patagonian Andes

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Gorjón S. P., Greslebin A. G. & Rajchenberg M. (2012) The genus *Athelopsis* (*Atheliales*, *Basidiomycota*) in the Patagonian Andes. – *Sydowia* 64 (1): 29–37.

The genus *Athelopsis* in Patagonia is surveyed and five species are reported. *Athelopsis tenuicystidiata* is described as new, differing from other species within *Athelopsis* mainly by the presence of large leptocystidia. *Athelopsis lembospora* is reported as new to Patagonia. In addition, *Athelopsis glaucina*, *A. gloeocystidiata*, *A. subinconspicua*, and *A. virescens* are commented. A key to the known athelioid fungi from Patagonia is included.

Keywords: *Araucaria*, Argentina, *Athelia*, *Leptosporomyces*, corticioid fungi, cystidia.

The genus *Athelopsis* comprises species with a loosely attached and pellicular basidioma, hymenial surface usually with yellowish to greenish tints, hymenophore smooth or rarely with hyphal pegs, monomitic hyphal system usually with clamp connections (few species with simple septa), pedunculate basidia, and smooth, ellipsoid to allantoid basidiospores. *Athelopsis* basidiomata remind of *Athelia* but basidia in *Athelopsis* are disposed in a compact layer contrary to those of *Athelia*, which are arranged in more open and branched candelabrum-like clusters. Hjortstam & Ryvarden (2010) accepted and keyed out 14 species in *Athelopsis*. *Pteridomyces* was erected to accommodate *Epithele galzinii* Bres., an inconspicuous species growing on ferns, with a fragile and closely adnate basidioma, hymenophore with sterile hyphal pegs, short basidia, and smooth curved basidiospores (Jülich 1979). Hjortstam (1991) considered *Pteridomyces* a synonym of *Athelopsis* emphasizing the similar shape of the basidia and basidiospores. We have examined some specimens of *Epithele galzinii* and they show a quite different structure of the basidioma, contrary to *Corticium glaucinum* Bourdot & Galzin, the type species of *Athelopsis*. We prefer to retain *Pteridomyces*, based on the presence of sterile hyphal pegs and the absence of a well-developed subiculum, at least until phylogenetic relationships of *E. galzinii* (still not sequenced) with other athelioid genera can be established. According to molecular studies by Larsson *et al.* (2004) and Larsson (2007), the analysed *Athelopsis* species form a polyphyletic group within the athelioid clade, close to *Athelia*, *Piloderma*, and *Byssocorticium*.

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In the Patagonian Andes forest, four *Athelopsis* species were previously reported by Greslebin & Rajchenberg (2003). Now we can confirm the presence of the cosmopolitan *Athelopsis lembospora* (Bourdot) Oberw. and an undescribed *Athelopsis* with distinctive thin-walled leptocystidia, different from previously known species, that we propose as new below. In addition, a key to athelioid fungi in this area is included.

Materials and methods

For light microscopic studies, samples were mounted in 3 % KOH, Melzer's reagent (IKI), and 0.1 % cotton blue in 60 % lactic acid. Basidiospores from dried basidiomata were measured in 3 % KOH using a ZEISS Standard 20 microscope. Line drawings were made with a camera lucida attachment. Specimens are deposited in the public herbaria BAFC, SALA, and the "Centro de Investigación y Extensión Forestal Andino Patagónico" (CIEFAP, Esquel, Argentina) herbarium.

Athelopsis species in the Patagonian Andes forests

Athelopsis glaucina (Bourdot & Galzin) Oberw. ex Parmasto, Consp. System. Corticiac. (Tartu): 42. 1968.

Basionym. – *Corticium glaucinum* Bourdot & Galzin, Hyménomyc. de France (Sceaux): 207. 1928.

Habitat. – In Patagonia known in temperate forests growing on dead wood of *Drymis winteri* J.R. Forst. & G. Forst. (Winteraceae), *Nothofagus alpina* (Poepp. et Endl.) Oerst. (= *N. nervosa*), *N. antarctica* (G. Forst.) Oerst., *N. betuloides* (Mirb.) Oerst., *N. dombeyi* Mirb. (Oerst.), *N. pumilio* (Poepp. & Endl.) Krasser (Nothofagaceae), and *Maytenus magellanica* (Lam.) Hook. f. (Celastraceae).

Global distribution. – Europe (type locality – France), North America, Africa, and Argentina.

Material examined. – ARGENTINA, Chubut, National Park Los Alerces, Krüger lake area, on dead wood of *N. dombeyi*, 26 Mar 2011, leg. & det. S. P. Gorjón (SPG 3047); *ib.*, Neuquén, between Queñi and Nonthue lakes, on *N. nervosa*, 18 May 2010, leg. & det. S. P. Gorjón (SPG 2839); *ib.*, Tierra del Fuego, Dpto. Ushuaia, Escondido lake, on *N. betuloides*, 26 Apr 1999, leg. & det. A. G. Greslebin (AG 1961); *ib.*, Carbajal valley, on *N. pumilio*, 22 Mar 1998, leg. & det. A. G. Greslebin (AG 1435); *ib.*, Ea. Moat, on *Drymis winteri*, 21 Mar 1998, leg. & det. A. G. Greslebin (AG 1386).

Comments. – *Athelopsis glaucina* is characterized by the pellicular basidiomata, usually with conspicuous yellowish green tints, and the cylindrical to subfusiform basidiospores, generally glued together in groups. See Greslebin (2002) for further comments.

Athelopsis gloeocystidiata Gresl. & Rajchenb., Mycotaxon 73: 9. 1999.

Habitat. – Patagonian Andes temperate forests growing on dead wood of *Nothofagus antarctica* and *N. pumilio*.

Global distribution. – Patagonian Andes (type locality – Argentina).

Material examined. – ARGENTINA, Chubut, Dpto. Languiño, Guacho lake, on fallen wood of *N. pumilio*, 18 Apr 1997, leg. & det. A. G. Greslebin (AG 759, BAFC 3429, holotype); *ib.*, Tierra del Fuego, Dpto. Río Grande, Ea. Los Cerros, on *N. antarctica*, 27 Apr 1999, leg. & det. A. G. Greslebin (AG 1975).

Comments. – It is characterized by the presence of yellowish refractive gloeocystidia, a unique feature within *Athelopsis*. For a complete description see Greslebin & Rajchenberg (1999).

Athelopsis lembospora (Bourdot) Oberw., Persoonia 7(1): 3. 1972.

Basionym. – *Corticium lembosporum* Bourdot, Rev. Sci. Bourb. Centr. France 23(1): 10. 1910.

Habitat. – In the Patagonian Andes, growing on *Luma apiculata* (DC.) Burret (Myrtaceae) and *Fuchsia magellanica* Lam. (Onagraceae) in humid riparian forest, always on bark.

Global distribution. – Cosmopolitan (type locality – France). Not previously reported from the Patagonian Andes.

Material examined. – CHILE, X Region, Entre Lagos, sendero de Chile, on bark of *L. apiculata*, 22 Feb 2010, leg. S. P. Gorjón & N. Hallenberg, det. S. P. Gorjón (SPG 2612); *ib.*, XI Region, La Junta, El Sauce, on bark of *F. magellanica*, 18 Jan 2011, leg. & det. S. P. Gorjón (SPG 3018).

Comments. – *Athelopsis lembospora* is characterized by the curved subfusiform to suballantoid basidiospores. For a complete description see Kotiranta & Saarenoksa (2005) and Bernicchia & Gorjón (2010).

Athelopsis subinconspicua (Litsch.) Jülich, Persoonia 8(3): 292. 1975.

Basionym. – *Corticium subinconspicuum* Litsch., Glasn. Skopsk. Naucn. Drustva 18: 178. 1938.

Habitat. – In the Patagonian Andes, known on dead wood of *Austrocedrus chilensis* (D. Don) Pic. Serm. & Bizzarri (Cupressaceae) and *Nothofagus pumilio*.

Global distribution. – Europe (type locality – Macedonia), North America, and Argentina.

Material examined. – ARGENTINA, Tierra del Fuego, Termas, on *N. pumilio*, 30 Nov 1995, leg. & det. A. G. Greslebin (AG 86).

Comments. – *Athelopsis subinconspicua* is characterized above all by the broadly ellipsoid basidiospores. For a complete description see Greslebin (2002) and Bernicchia & Gorjón (2010).

Athelopsis tenuicystidiata Gorjón, Gresl. & Rajchenb. **sp. nov.** – Figs. 1–2.
Mycobank no.: MB 563148

Basidioma resupinatum, pelliculare, leve, albido, margo indistinctus, rhizomorphae albidae presentes. Systema hyphale monomiticum, hyphae basales tenuitunicatae, incurvatae, strictae, 3–4,5 µm latae, hyphae subhymeniales tenuitunicatae, 2–4 µm latae, irregulares, hyphae fibulatae. Cystidia abunda, tenuitunicata, levia, (50)60–70(80) × 5–7 µm, cum fibula basali. Basidia clavata, tenuitunicata, 25–35 × 6–8 µm, 4-sterigmatibus, cum fibula

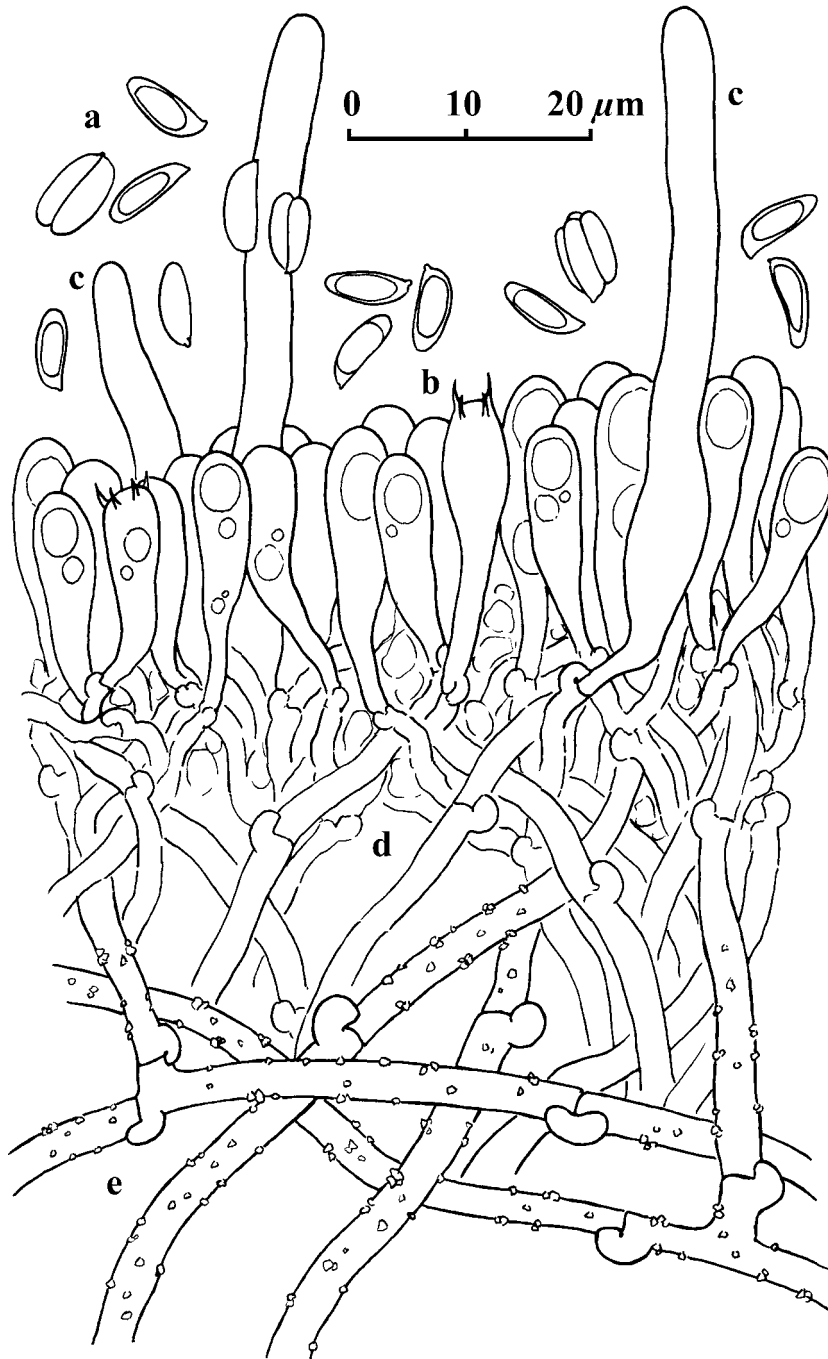


Fig. 1. *Athelopsis tenuicystidiata*, S. P. Gorjón 3374, holotype; **a.** Basidiospores. **b.** Basidia. **c.** Cystidia. **d.** Subhymenial hyphae. **e.** Subicular hyphae.

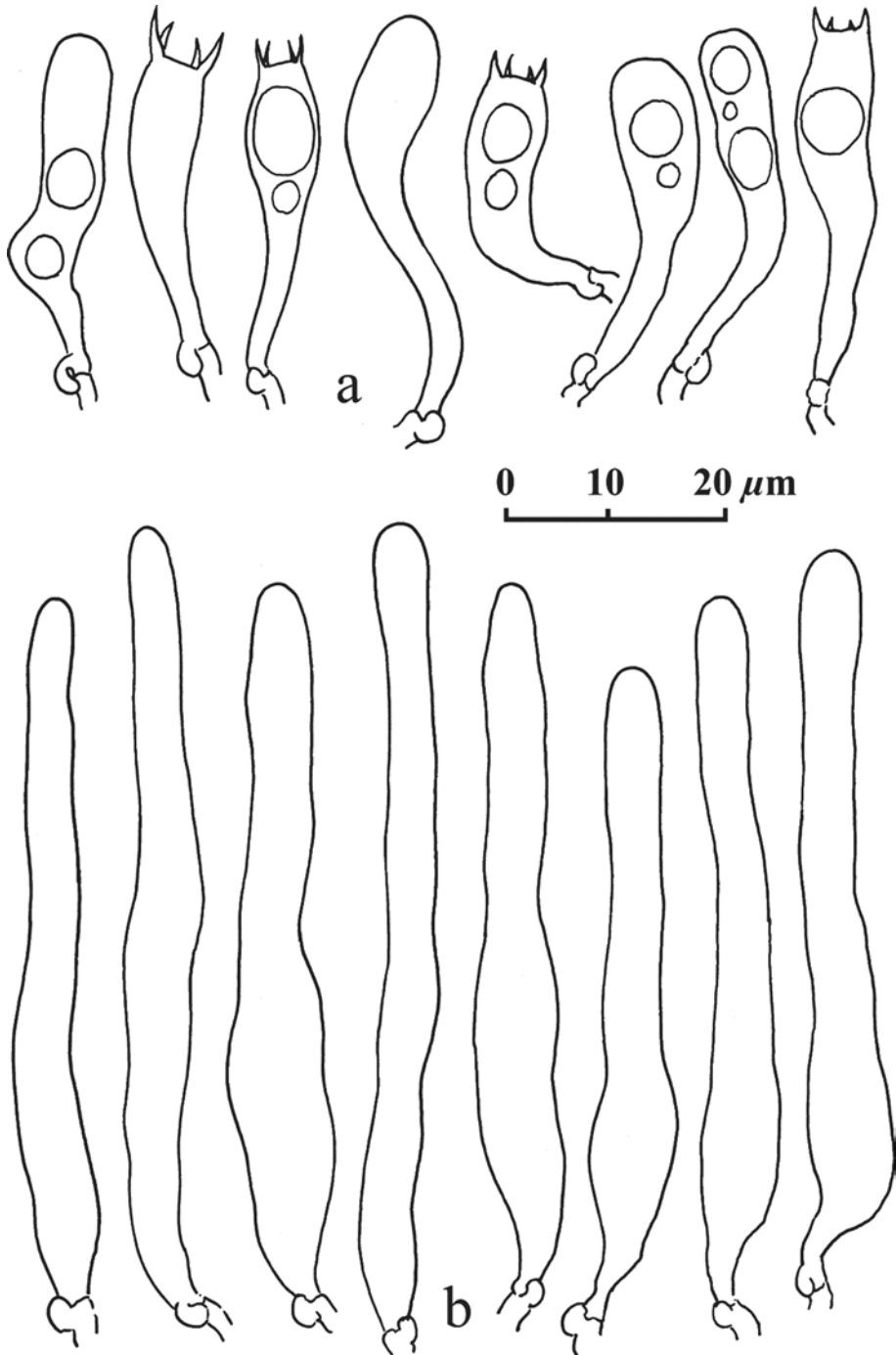


Fig. 2. *Athelopsis tenuicystidiata*, S. P. Gorjón 3374, holotype; a. Basidia. b. Cystidia.

basali. Basidiosporae subcylindraceae usque ad anguste ellipsoideae, aliquot subnaviculares, hyalinae, tenuitunicatae, leves, 7–8,5 μm longae, 2,5–3 μm latae, inamyloideae, indextrinoideae, acyanophilae, saepe quaternibus se congregatae. Ad lignum putridum arborum coniferarum. Differt ab *Athelopsis colombiensis* cystidiis et basidiosporis longioribus.

Holotypus. – ARGENTINA, Neuquén, Villa Pehuenia, consorcio Pulmarí, 38° 57' 16" S, 71° 22' 39" W, 1280 m a.s.l., on decayed wood of *Araucaria araucana* (Molina) K. Koch, 12 May 2011, leg. S. P. Gorjón (SPG 3374), BAFC (holotype), SALA and herbarium of Centro de Investigación y Extensión Forestal Andino-Patagónico (isotypes).

Basidiomata resupinate, pellicular, hymenial surface smooth, whitish, margin rhizomorphic with distinct white hyphal strands. **Hyphal system** monomitic, subhymenial hyphae thin-walled, 2–4 μm in diam., usually smooth or slightly encrusted, subicular hyphae with distinct walls, 3–4.5 μm in diam., usually encrusted with hyaline irregular crystals, all hyphae hyaline and with clamp connections. **Cystidia** tubular with obtuse apex, (50)60–70(80) \times 5–7 μm , thin-walled, not encrusted, with basal clamp connection, some widened at the base up to 8–9 μm , projecting 20–30 μm above the basidial layer, usually with basidiospores adhered to the projecting part. **Basidia** clavate, 25–35 \times 6–8 μm , pedunculate and with basal clamp connection, thin-walled, with four sterigmata. **Basidiospores** subcylindrical to narrowly ellipsoid, some subnavicular, 7–8(8.5) \times 2.5–3 μm , smooth, thin-walled, often dispersed in groups of two or four basidiospores, inamyloid, indextrinoid, acyanophilous, often with a big guttula.

Etymology. – From Latin *tenuis* = thin and *cystidiatus* = with cystidia, referring to the presence of thin-walled cystidia.

Habitat. – Patagonian Andes temperate forests growing on dead wood of *Araucaria araucana* (*Araucariaceae*) in mixed forest with *Nothofagus pumilio*.

Global distribution. – Argentinean Patagonia, Neuquén province.
Material examined. – See holotype.

Comments. – *Athelopsis tenuicystidiata* is characterized and easily distinguishable from other *Athelopsis* species by the presence of large leptocystidia. *Athelopsis colombiensis* Hjortstam & Ryvar den has smaller tubular cystidia (25–30 \times 4–6 μm) and smaller basidiospores (4.5–5 \times 2.75–3 μm); in addition *A. colombiensis* lacks rhizomorphs (Hjortstam & Ryvar den 2001). Two more species in *Athelopsis* have cystidial elements: *Athelopsis gloeocystidiata*, with refractive yellowish gloeocystidia (Greslebin & Rajchenberg 1999) and *Athelopsis vesicularis* Hjortstam & Spooner with vesicular cystidia with a papillate to rostrate apical part and larger basidiospores (Hjortstam *et al.* 2009).

Athelopsis virescens Hallenb. & Hjortstam, Mycotaxon 57: 117. 1996.

Habitat. – Temperate forest, usually growing on dead small branches of *Nothofagus antarctica*, *N. pumilio*, and *N. dombeyi*.

Global distribution. – Patagonian Andes (type locality – Argentina).

Material examined. – ARGENTINA, Chubut, National Park Los Alerces, Verde lake area, on dead wood of *N. dombeysi*, 27 Apr 2010, leg. & det. S. P. Gorjón (SPG 2670); *ib.*, Tierra del Fuego, National Park Tierra del Fuego, Negra lagoon, on *N. antarctica*, 20 Mar 1998, leg. & det. A. G. Greslebin (AG 1361).

Comments. – *Athelopsis virescens* is easily distinguishable by the whitish to greenish athelioid basidioma, and the reaction of the hymenial surface turning yellowish green in KOH. For a complete description see Hal-lenberg & Hjortstam (1996).

Key to the athelioid fungi in Patagonia

1. Basidiospores amyloid or with a greyish reaction in Melzer's reagent 2
- 1*. Basidiospores with a negative reaction in Melzer's reagent 7
2. Basidiospores verrucose . . . ***Amyloathelia aspera*** Hjortstam & Ryvar-den
- 2*. Basidiospores smooth 3
3. Basidiospores thin-walled 4
- 3*. Basidiospores thick-walled 5
4. Hyphae with clamp connections ***Amylocorticium cebennense***
(Bourdot) Pouzar
- 4*. Hyphae with simple-septa ***Amylocorticium rhodoleucum***
(Bourdot) J. Erikss. & Ryvar-den
5. Hymenial surface hydroid to irpicoid ***Amylocorticium oblongisporum*** (G. Cunn.) Gorjón, Gresl. & Rajchenb.
- 5*. Hymenial surface smooth to merulioid 6
6. Leptocystidia present . . . ***Amylocorticium molle*** (Fr.) Spirin & Zmitr.
- 6*. Cystidia lacking ***Amylocorticium iaganicum*** (Speg.)
Gorjón, Gresl. & Rajchenb.
7. Basidiospores thick-walled ***Piloderma byssinum*** (P. Karst.) Jülich
- 7*. Basidiospores thin-walled 8
8. Basidia pedunculate 9
- 8*. Basidia not pedunculate 14
9. Cystidia present 10
- 9*. Cystidia absent 11
10. Gloeocystidia with refringent contents present. ***Athelopsis gloeocystidiata***
- 10*. Gloeocystidia absent, leptocystidia present ***Athelopsis tenuicystidiata***
11. Hymenial surface becoming yellowish green in KOH ***Athelopsis virescens***
- 11*. Hymenial surface with no colour changes in KOH 12
12. Basidiospores cylindrical, 8–10 × 2–3 µm ***Athelopsis glaucina***
- 12*. Basidiospores different 13
13. Basidiospores ellipsoid, 5–7 × 4–5 µm ***Athelopsis subin conspicua***
- 13*. Basidiospores subfusiform, 6.5–9 × 3.5(4) µm wide ***Athelopsis lembospora***
14. Basidiospores up to 5 µm long, basidia up to 20 µm long, with yellow hyphal strands ***Leptosporomyces luteofibrillosus*** Hjortstam & Ryvar-den

- 14*. Not as above 15
15. All hyphae with simple septa *Athelia decipiens* (Höhn. & Litsch.)
J. Erikss.
- 15*. Clamp connections present, at least in some septa of the subicular
hyphae 16
16. Clamp connections present in all septa *Athelia bombacina* (Link) Pers.
- 16*. Clamp connections present in the subicular hyphae, alternating with
simple septa 17
17. Basidiospores 8–11 µm long, basidia usually with two sterigmata *Athelia
arachnoidea* (Berk.) Jülich
- 17*. Basidiospores up to 8 µm long, basidia usually with four sterigmata 18
18. Basidiospores narrowly ellipsoid to subfusoid, up to 2.5 µm wide *Athelia
acrospora* Jülich
- 18*. Basidiospores ellipsoid, 3–4 µm wide *Athelia epiphylla* Pers.

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