Some rare or critical taxa of the genus *Lyophyllum* s. l. (*Basidiomycota, Agaricomycetes*) from La Palma (Canary Islands, Spain)

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Abstract: Some rare or critical species of the genus *Lyophyllum* collected in La Palma (Canary Islands) are described and taxonomically commented based on morphological data. For most of the species detailed descriptions, microscopical drawings and colour plates are presented. The species taken into account are: *L. bonii*, *L. ignobile*, *L. leucophaeatum*, *L. maas-geesterani*, *L. maleolens*, *L.* spec., *L. semitale* (with its var. *intermedium*), and *L. subglobisporum*.

Zusammenfassung: Einige seltene oder kritische Arten der Gattung *Lyophyllum*, gefunden in La Palma (Kanarische Inseln), werden beschrieben und basierend auf morphologischen Merkmalen taxonomisch kommentiert. Für die meisten Arten liegen eine detaillierte Beschreibung, mikroskopische Zeichnungen und Farbfotos vor. Vorgestellt werden: *L. bonii*, *L. ignobile*, *L. leucophaetum*, *L. maas-geesterani*, *L. maleolens*, *L.* spec., *L. semitale* (mit der var. *intermedium)* und *L. subglobisporum*.

Over the past ten years the first author (RMD) has been collecting agarics in the little island of La Palma, in the Canary Islands, a very interesting biotope whose mycoflora is not yet well known. Several collections concerning interesting and rare members of *Lyophyllaceae* are presented along with commented descriptions and colour photographs.

The collections were made at an altitude of 1300-1400 m a. s. l., in pine-forests with *Pinus radiata* D. DON and/or *Pinus canariensis* C. SMITH, often with *Cistus symphytifolius* LAM.

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Material and methods

The macroscopical descriptions are based on the detailed field-notes taken by RMD on fresh material. The micromorphological data are from dried material revived in 2% KOH and stained with Congo red and Phloxin B. Cotton Blue was used to highlight the siderophilous granulation in the basidia.

Unless otherwise stated, the specimens are stored in the private herbarium of RMD.

Species list

Lyophyllum bonii **CONTU** in Doc. Mycol. **26/102**: 67, 1996 (Fig. 1)

Pileus: 4-5.5 cm, convex then expanding but with a paraboloid margin, at times depressed at centre, not umbonate, dark brown fading buff, not striate, with a persistently inrolled margin.

Lamellae: not very crowded, moderately thick, shortly decurrent, pale brown then blackening when bruised.

Stipe: 5-8 × 0.3-0.5 cm, cylindrical, pale cream to pale brown, appressed-fibrillose.

Context: thin, pale cream in the pileus but darker in the stipe. Smell and taste none. Dried material black.

Micromorphology: as in the type collection (CONTU 1996).

Collection examined: Canary Islands, La Palma, El Pilar, in a pine-wood with *Pinus canariensis*, 15. 11. 1981, leg. RMD 44, herb. Soc. Mycol. La Palma.

This is the first record of *L. bonii* outside Italy, where it was collected under *Quercus* (CONTU 1996). The material from La Palma, apart from the unusual ecology, fits well the description in the protologue. The brownish colours, the blackening, shortly decurrent lamellae, the elongate, stout basidia, easily exceeding 35 µm in length, and the broadly ellipsoid basidiospores distinguish this species very well.

Lyophyllum ignobile **(P. KARST.) CLÉMENÇON** in Mycotaxon **15**: 77, 1982 (Fig. 2)
≡ *Agaricus ignobilis* P. KARST. in Mycol. Fenn. **3**: 368, 1876
≡ *Collybia ignobilis* (P. KARST.) P. KARST. in Bidr. Kann. Finl. Ntr. Folk **32**: 160, 1879.

Pileus: 2.5-3.5 cm, not very fleshy, convex with a paraboloid margin, not umbonate, fuscous-brown, not striate, entirely overlaid with a white pruina.

Lamellae: moderately crowded, thickish, uncinate-adnate, dark brown to fuscous-brown, browning then blackening when bruised.

Stipe: 5-6 × 0.3-0.5 cm, cylindrical, white, appressed-fibrillose, covered by an abundant white pruina.

Context: thin, pale brown in the pileus but darker in the stipe. Smell and taste mealy. Dried material dark brown.

Spores: 6-7.5 × 3.7-4.5 µm, hyaline, cyanophilous, ellipsoid, without suprahilar depression, with an ogival apex, usually with a single large oil-drop, smooth, thin-walled.

Basidia: 22-30 × 7-8 µm, four-spored, clavate; subhymenium ramose.

Fig. 1. *Lyophyllum bonii*. – Fig. 2. *Lyophyllum ignobile*. – Fig. 3. *Lyophyllum leucophaetum*. – Phot. R. M. DÄHNCKE.

Hymenophoral trama: regular, made up of hyaline hyphae.

Cystidia and marginal cells: none.

Pileipellis: made up of an undifferentiated cutis of smooth, cylindrical, radially arranged hyphae, 3-5 µm wide, with intraparietal and encrusting pigment.

Clamp connections: at all septa.

Collection examined: Canary Islands, La Palma, Cumbre Nueva, under *Cistus symphytifolius*, in a pine-wood with *Pinus canariensis*, 10. 12. 2003, leg. RMD 1826.

Until now *L. ignobile* was known only from Fennoscandia (typus, CLÉMENÇON 1982), France (BON 1999) and Italy (CONSIGLIO & CONTU 2002, with a colour photograph of fresh basidiomata). The ellipsoid-elongate basidiospores and the dark tinges of the pileus could favour confusion between this species and *L. semitale*, but the latter is distinguished by the much longer, stouter basidia and larger basidiospores.

***Lyophyllum leucophaeatum* (P. KARST.) P. KARST.** in Acta Soc. Fauna Flora Fenn. **3**: 3, 1861 (Fig. 3)

Descriptions: see CLEMENÇON (1986: 69-70), BON (1999: 89), KALAMEES (2004: 34-35).

This is the first record of this species for the Canary Islands. All the characters of the collection were typical.

Collection examined: Canary Islands, La Palma, Hoyo del Rehielo, in a pine-wood with *Pinus canariensis*, 22. 10. 2004, leg. RMD 103, herb. Soc. Mycol. La Palma.

***Lyophyllum maas-geesterani* CLÉMENÇON & WINTERH.** in Persoonia **14**: 533, 1992 (Fig. 4)

Pileus: 2.5-3.5 cm, not very fleshy, convex with a paraboloid margin, not umbonate, dark greyish-brown fading buff, not striate.

Lamellae: not very crowded, thickish, uncinate-adnate, dark brown, slightly blackening when bruised.

Stipe: 2.5-5 × 0.6-0.7 cm, cylindrical, greyish to greyish-brown, appressed-fibrillose, apex covered by an abundant white pruina.

Context: thin, pale brown in the pileus but darker in the stem. Smell and taste mealy or like cucumber. Dried material dark brown.

Micromorphology: as in the type collection (CLÉMENÇON & WINTERHOFF 1992).

Collection examined: Canary Islands, La Palma, Pajonales, under *Morella faya* (AIT.) WILBUR, at the edge of a pine-wood, 3. 1. 1999, leg. RMD 1368, det. M. BON, herb. Soc. Mycol. La Palma.

This is a very interesting record because this rare species was previously known only from Germany, where it was collected under hardwoods (CLÉMENÇON & WINTERHOFF 1992, WINTERHOFF 1993 – colour photograph of fresh basidiomata). The collybiod stature, the small, elongate basidiospores and the small, short basidia are diagnostic.

Fig. 4. *Lyophyllum maas-geesterani*. – Fig. 5. *Lyophyllum maleolens*. – Fig. 6. *Lyophyllum* spec. – Phot. R. M. DÄHNCKE.

Lyophyllum maleolens MELIS & CONTU in Micol. Veget. Medit. **15**: 102, 2000 (Fig. 5)

Pileus: 2.5-6.5 cm, fleshy, convex with a paraboloid margin, not umbonate, brown to dark fuscous-brown, smooth, not striate.

Lamellae: normally crowded, thickish, uncinate-adnate, pale brownish, taking an orange-brown tinge when handled.

Stipe: 5-6.5 × 1-1.5 cm, clavate with a rooting base, white to pale cream, smooth or covered by very thin appressed fibrillae, apex covered by a white pruina.

Context: thick, pale brown in the pileus but darker in the stipe. Smell and taste mealy or like cucumber. Dried material black.

Spores: 7-8.5 × 3.7-4.5 µm, hyaline, cyanophilous, fusiform to amygdaliform, normally with an obvious suprahilar depression, usually with several oil-drops, thick-walled.

Basidia: 30-40 × 8-9 µm, 4-spored, clavate.

Subhymenium: ramose, not gelatinized.

Hymenophoral trama: regular, made up of hyaline hyphae.

Cystidia and marginal cells: none.

Pileipellis: made up of an undifferentiated cutis of interwoven, smooth, cylindrical hyphae, 3-7.5 µm wide, with parietal pigment; suprapellis an ixocutis; subpellis and trama constituted by wider, interwoven hyphae.

Clamp connections: at all septa.

Collection examined: Canary Islands, La Palma, Llano de Mosca, under *Pinus canariensis*, 23. 11. 2007, leg. RMD 2633, 2635.

This is a very peculiar species due to its caespitose habit, browning (with a reddish initial tinge) lamellae, unpleasant smell and fusiform to amygdaliform basidiospores exhibiting a very obvious suprahilar depression (MELIS & CONTU 2000, CONSIGLIO & CONTU 2002). *Lyophyllum aemiliae* CONSIGLIO looks similar but has darker, fuscous tinges in the pileus, which is umbonate, a differently-smelling context and ellipsoid-elongate basidiospores, without such suprahilar depression (CONSIGLIO 1998).

Lyophyllum amygdalosporum KALAMEES (type seen by M. CONTU) is different in having bigger basidiospores and lamellae discolouring first blue, then black, when bruised (KALAMEES 2004). This is the first record of *L. maleolens* outside Sardinia, where it was collected under *Quercus ilex* L. on basic soil.

***Lyophyllum* spec.** (Fig. 6)

Pileus: 6-14 cm, very fleshy, apparently not subcartilaginous, convex with a paraboloid margin, not umbonate, dark grey but with brownish-cream spots, smooth, not striate, covered by a white pruina.

Lamellae: crowded, thickish, adnexed, ash-grey to dark grey, not changing colour when handled.

Stipe: 7-12 × 1.5-3 cm, clavate, polished or very slightly fibrillose, pale greyish appressed-fibrillose, covered by a white pruina.

Context: thick, white, unchanging. Smell and taste faint. Dried material greyish-brown.

Fig. 7. *Lyophyllum semitale*. – Fig. 8. *Lyophyllum semitale* var. *intermedium*. – Fig. 9. *Lyophyllum subglobisporum*. – Phot. R. M. DÄHNCKE.

Spores: 4.5-5.2 × 3.5-4.5 µm, hyaline, cyanophilous, globose to subglobose, usually with a single large oil-drop.

Basidia: 22-30 × 7-8.5 µm, four-spored, clavate.

Subhymenium: ramose.

Hymenophoral trama: regular, made up of hyaline hyphae bearing a membranal greyish pigment, up to 8(-10) µm wide.

Cystidia and marginal cells: none.

Pileipellis: made up of a compact undifferentiated cutis of radially arranged, 3-8 µm wide, smooth, cylindrical hyphae; suprapellis slightly gelatinized.

Clamp connections: present but not at all septa.

Collections examined: Canary Islands, La Palma, El Pilar, 15. 10. 2001, in a pine-wood, RMD 1547; - - ditto, 20. 10. 2008, RMD 2776.

BON (1999) described this fungus as a new species ad interim, viz. "*Lyophyllum pruinatum* BON & CONTU" based on the collection "M.C. (= MARCO CONTU, our note) 891127" which obviously belongs to *L. littoralis* (BALLERO & CONTU) CONTU as is clearly reported in the protologue of "*Calocybe littoralis* BALLERO & CONTU" (BALLERO & CONTU 1989). Therefore it seems that "*Lyophyllum pruinatum* BON & CONTU" and *L. littoralis*, the latter described by BON in the same work on the basis of compiled data, are one and the same species.

While reviewing the material of *Lyophyllum* sent by RMD, M. CONTU came across two collections of an agaric, already studied some years ago also by M. BON and named "*Lyophyllum* cf. *pruinatum*", which appeared very similar to *L. littoralis* due to its light ash-grey, pruinose pileus, the context unchanging when handled and lacking a distinctive smell, and the small, smooth, globose to subglobose basidiospores. These collections could not be assigned to *L. littoralis* on account of their smaller basidia similar to those of *L. subglobisporum*, greyish lamellae and apparently non-cartilaginous context. The pileus, moreover, does not seem to be as widely depressed at the centre as in *L. littoralis*.

We think that further and especially molecular work is necessary to clear the taxonomic position of this agaric. For the time being we prefer to keep the collections from La Palma apart.

***Lyophyllum semitale* (FR.) KÜHNER ex KALAMEES** in Z. Mykol. **60**: 16, 1994 (Fig. 7)
≡ *Agaricus semitalis* FR., Syst. Mycol. (Lundae) **1**: 117, 1821
≡ *Collybia semitalis* (FR.) QUÉL., Mém. Soc. Émul. Montbéliard, Sér. 2, **5**: 92, 1872
≡ *Tricholoma semitalis* (FR.) RICKEN in Die Blätterpilze: 358, 1915.

Descriptions: see CLEMENÇON (1986: 76), BON (1999: 95), KALAMEES (2004: 38-39).

Collections examined: Canary Islands, La Palma, Pajonalis, under *Cistus symphytifolius*, 18. 1. 2004, RMD 1857; - Hoyo del Rehielo, under *Pinus canariensis*, 22. 10. 2004, RMD 2003; - - 30. 11. 2007, RMD 2660; - - 9. 12. 2007, RMD 2684; - - 26. 12. 2007, RMD 2719; - El Pilar, in mixed *P. canariensis-P. radiata* forest, 17. 11. 2005, RMD 2193; - La Pared Vieja, under *Pinus radiata*, 30. 12. 2007, RMD 2730.

All the collections studied are typical for this species, which is quite frequent in Europe. Despite the variability of colours and habit of basidiomata, the ellipsoid,

slightly apically depressed basidiospores, the stout and elongate basidia and the lack of marginal cells are diagnostic.

***Lyophyllum semitale* var. *intermedium* ROMAGN.** in Beitr. Kenntnis Pilze Mitteleuropas **3**: 119, 1987 (Fig. 8)

Pileus: 2.5-6.5 cm, not very fleshy, subcartilaginous, convex with a paraboloid margin, not umbonate, fuscous-brown, smooth, not striate.

Lamellae: normally crowded, thickish, uncinate-adnate, brownish, taking a wood-brown tinge when handled.

Stipe: 4-6.5 × 0.8-1.2 cm, cylindrical, greyish-brown, appressed-fibrillose, apex covered by a white pruina.

Context: thin, pale brown in the pileus, much darker in the stipe. Smell and taste mealy, but smell often weak. Dried material blackish-brown.

Spores: 6-7 × 3.7-4.8 µm, hyaline, cyanophilous, ellipsoid to amygdaliform, usually with a single large oil-drop, smooth, thick-walled.

Basidia: 30-37.5 × 8-9 µm, four-spored, clavate, sometimes pedicellate.

Subhymenium: cellular.

Hymenophoral trama: regular, made up of thin, hyaline hyphae.

Cystidia and marginal cells: none.

Pileipellis: consisting of an undifferentiated cutis of smooth, cylindrical, radially arranged hyphae, 2.5-5 µm wide, with intraparietal pigment; suprapellis an ixocutis.

Clamp connections: at all septa.

Collections examined: Canary Islands, Cumbre Vieja, under *Cistus symphytifolius*, 13. 12. 2006, leg. RMD 2521; - - ditto, Hoyo del Rehielo, under *Cistus symphytifolius*, 19. 11. 2005, leg. RMD 2201; - - ditto, El Pilar, in a pine wood, 14. 11. 2004, RMD 2029 and 2030.

ROMAGNESI (1987) segregates this taxon from the typical *L. semitale* because of the slender, not very fleshy habit, reminding of a *Tephrocybe* species and the slightly smaller and wider basidiospores, recorded as "7-8(-8.5) × (3.5-)4-5 µm". Whilst comparing the collections of *L. semitale* made by RMD in La Palma, we found that the size of the basidioma is not correlated to the size of the basidiospores and that collections with the usual size for the typical *L. semitale* but with smaller basidiospores do exist and are not so rare. As a consequence, the only reliable feature separating the taxa is spore size. Obviously, the micromorphology (especially the length) of the basidia is exactly the same both in *L. semitale* var. *semitale* and *L. semitale* var. *intermedium*, so that confusion with *Tephrocybe* species, which have small, collybioid basidia, can be easily avoided.

RMD also collected a species with basidiospores even smaller than those of *L. semitale* var. *intermedium*, and basidia likewise smaller, not exceeding 30 µm in length. Most likely, however, this is another undescribed species, which is close to the taxa belonging to the *L. ignobile* complex.

Lyophyllum subglobisporum **CONSIGLIO & CONTU** in Doc. Mycol. **30/120**: 44, 2001 (Fig. 9)

Pileus: 4-9 cm, fleshy, apparently not subcartilaginous, convex with a paraboloid margin, not umbonate, dark brown to pale ochraceous-cream with dark fuscous-brown centre, smooth, not striate.

Lamellae: crowded, thickish, uncinate-adnate, white to pale cream, not changing colour when handled.

Stipe: 7-10 × 1.5-2.5 cm, clavate, polished, white.

Context: thick, white, unchanging. Smell and taste weak. Dried material greyish-brown.

Spores: 4.5-6 × 3-4 µm, hyaline, cyanophilous, subglobose to widely ellipsoid, mostly widely ellipsoid, usually with a single large oil-drop, with an obtuse apex and a thin wall.

Basidia: 22-30 × 7-8.5 µm, four-spored, with a patent siderophilous granulation, clavate.

Subhymenium: ramose.

Hymenophoral trama: regular, made up of hyaline hyphae.

Cystidia and marginal cells: none.

Pileipellis: made up of a compact, undifferentiated cutis of smooth, cylindrical, radially arranged hyphae, 3-6 µm wide, with intraparietal pigment.

Clamp connections: at all septa.

Collection examined: Canary Islands, La Palma, Pajonales, under *Cistus symphytifolius* in pinewood with *Pinus canariensis*, 6. 11. 2000, RMD 2661.

Among the robust, fleshy, non-staining *Lyophyllum* species of sect. *Aggregata*, *L. subglobisporum* is easily recognized by the subglobose to broadly ellipsoid basidiospores and the relatively small basidia, not exceeding 35 µm in length; all the other known species exhibit globose basidiospores and very stout and elongate, usually 35-38(-40) µm long basidia.

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