FLECHTEN FOLLMANN. CONTRIBUTIONS TO LICHENOLOGY IN HONOUR OF GERHARD FOLLMANN. - EDITED BY FRED J. A. DANIELS, MARGOT SCHULZ, AND JÖRG PEINE. - PUBLISHED BY THE GEOBOTANICAL AND PHYTOTAXONOMICAL STUDY GROUP, BOTANICAL INSTITUTE, UNIVERSITY OF COLOGNE, COLOGNE, GERMANY: PP. 205 - 221; 1995.

LICHENICOLOUS FUNGI FROM THE WESTERN PYRENEES, FRANCE AND SPAIN
I
NEW SPECIES OF DEUTEROMYCETES

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Key Words
Lichenicolous fungi, Deuteromycetes, Coelomycetes, Hyphomycetes, Pyrenees, France, Spain

Abstract
Three new genera and ten new species of lichenicolous Deuteromycetes are described from the western Pyrenees (France and Spain): *Berkleasmium parmeliellae* sp. nov. (on *Parmeliella testacea*), *Coniambigua phaeographidis* gen. et sp. nov. (on *Phaeographis lyellii*), *Cornutispora triangularis* sp. nov. (on *Pertusaria pertusa*), *Libertiella leprariae* sp. nov. (on *Lepraria lobificans*), *Lichenobactridium pertusariae* gen. et sp. nov. (on *Pertusaria pertusa*), *Phoma lobariae* sp. nov. (on *Lobaria pulmonaria*), *Pycnopsammina lobariae* gen. et sp. nov. (on *Lobaria pulmonaria*), *Sclerococcum hawksworthii* sp. nov. (on *Megalospora tuberculosa*), *Sclerococcum normandinae* sp. nov. (on *Normandina pulchella*), and *Spilodochium parmotrematis* sp. nov. (on *Parmotrema arnoldii*). Host selection, distribution, and relationships are discussed.

* Dedicated to Prof. Dr. GERHARD FOLLMANN on occasion of his 65th birthday and retirement from the University of Cologne, with respect to his pioneering lichenological studies on the Iberian Peninsula, combined with stimulating lichenological instructions in Spain.

Introduction

The authors have been studying lichenicolous fungi from the western Pyrenees (Pyrénées-Atlantiques in France and Navarra in Spain) for several years. About 150 taxa have been collected, including a number of apparently undescribed species. Before presenting a complete checklist, we intend to publish several papers with the descriptions and discussions of new or poorly known taxa. This first part of the series deals with a few new Deuteromycetes.

Material and Methods

Most specimens are located in the private herbaria of the authors, type specimens mainly in LG and MA-Lichen. Microscopical examination has been executed at a magnification of x 1500, using hand-made sections. All measurements have been done in water, and these preparations have also been used for the illustrations.

Results and Discussion

1.1. ***Berkleasmium parmeliellae*** ETAYO et DIEDERICH sp. nov.

Conidiomata lichenicola, sporodochia, maculiformia, pulvinata, atra; conidiophorae macronematae, non ramosa, levia; cellulae conidiogenae integratae, terminales, monoblasticae, determinatae, cylindricae, 6 - 9 x 4 - 5 µm; conidia solitaria, acrogena, rufa, muriformia, levia, clavata ad ellipsoidea, 40 - 55 x 22 - 27 µm, cellulis 4 - 6 µm in diametro (fig. 1).

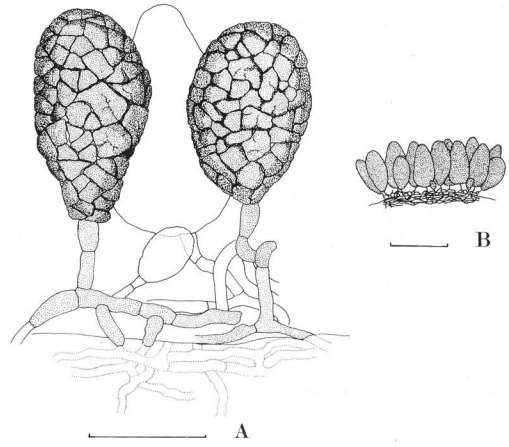

Fig. 1: *Berkleasmium parmeliellae* (holotypus): A mycelium, conidiophores and conidia; B sporodochium, schematic (scale: A = 20 µm, B = 100 µm)

Typus: France, Pyrénées-Atlantiques, Ste-Engrâce, Gorge de Ehujarre, on *Parmeliella testacea*, 18.VII.1991, J. ETAYO 5948 et P. DIEDERICH (MA-Lichen holotypus, Herb. ETAYO isotypus).

Conidiomata sporodochia, maculiform, pulvinate, greyish-black; mycelium partially immersed in the host thallus, with some superficial, brownish, anastomosing hyphae, 0.2 - 0.5 µm in diameter; conidiophores macronematous, unbranched, narrow, more or less flexuous, smooth; conidiogenous cells integrated, terminal monoblastic, determinate, cylindrical, 6 - 9 x 4 - 5 µm; conidia solitary, acrogenous, brown, muriform, smooth, clavate to ellipsoidal, rounded at the ends, 20 - 40 per conidioma (35 -) 40 - 55 (- 60) x (20 -) 22 - 27 (- 30) µm, composed of cells 4 - 6 µm in diameter (fig. 1).

Host: *Parmeliella testacea* P. JØRG. The host thallus is not damaged by the presence of this fungus. - Distribution: Only known from the type locality, a humid gorge in the French Pyrénées-Atlantiques. - Observations: This is the first lichenicolous species of its genus. It is distinguished from the other species with brown conidia without subtending cells by the dimensions of the conidia and the number of cells forming the conidia (MOORE 1961).

2.0. ***Coniambigua*** ETAYO et DIEDERICH gen. nov.

Conidiomata pycnidia, atra, non ostiolata, paries hyalinus; cellulae conidiogenae holoblasticae, integratae, terminales, hyalinae, irregulares; conidia acrogena, non septata, atrorufa, pariete ornamentate, forma variabile, rotundata, cylindrica vel polyedrica; species holotypica: *Coniambigua phaeographidis* ETAYO et DIEDERICH.

Conidiomata pycnidia, dark coloured, opening irregularly, wall hyaline; mycelium immersed, hyaline; conidiogenous cells difficult to interpret, holoblastic, integrated, terminal, hyaline, of an irregular form; conidia acrogenous, simple, dark brown, with a thin and ornamented outer wall, very variable in form, from more or less rounded to cylindrical or polyedric.

Observations: In mature conidiomata, the cavity is filled with conidia, and no conidiogenous cells are visible. When young, it is possible to see hyaline structures of a variable form and similar in size to conidia, which are considered here as being the conidiogenous cells. No similar genus of Coelomycetes could be found in the literature. Amongst the lichenicolous Coelomycetes, species of *Lichenoco-*

nium are macroscopically quite similar, but they differ in a completely deviating conidiogenesis which is easy to interpret.

2.1. ***Coniambigua phaeographidis*** ETAYO et DIEDERICH sp. nov.
Conidiomata lichenicola, effusa, atrorufa, 60 - 100 µm in diametro, immersa vel erumpescentia, paries hyalinis, 10 - 14 µm crassa; cellulae conidiogenae 5 - 13 x 5 - 8 µm; conidia 8 - 13 x 5 - 8 µm (fig. 2).

Typus: Spain, Navarra, Oronoz-Mugaire, Señorío de Bértiz, alt. 200 m, on *Phaeographis lyellii* growing on *Alnus glutinosa*, 5.VI.1988, J. ETAYO 4215 (MA-Lichen holotypus, Herb. ETAYO isotypus); ibid. 22.VII.1991, P. DIEDERICH 9748 et J. ETAYO (Herb. DIEDERICH topotypus).

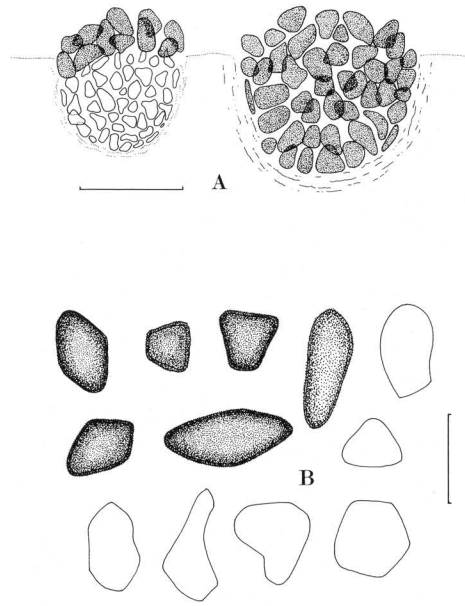

Fig. 2: *Coniambigua phaeographidis* (holotypus): A section through immersed conidiomata; B conidia (scale: A = 50 µm, B = 10 µm)

Conidiomata effuse, brown to brownish-black, 60 - 100 µm in diameter, immersed or erumpent, wall hyaline, 10 - 14 µm thick; conidiogenous cells 5 - 13 x 5 - 8 µm; conidia 8 - 13 x 5 - 8 µm (fig. 2).

Hosts: Thallus of *Phaeographis* sp., including *P. lyellii* (SMITH) ZAHLBR., always on *Alnus glutinosa* near rivers. The new species is often common and attacks all thalli of the host. However, it is never growing on neighbouring thalli of *Graphis elegans* (BORR. ex SM.) ACH. or *G. scripta* (L.) ACH. It is a parasite inhibiting the

formation of the host ascomata. Old dying conidiomata leave typical holes in the host thallus. - Distribution: The new species is only known from Spain (Navarra and Guipúzcoa), in ravine woods of the colline belt, where the host is most abundant. - Additional specimens: Spain, Guipúzcoa, Eñerozu, on *Phaeographis* sp., 1.VI.1991, J. ETAYO 5985 (Herb. ETAYO); Guipúzcoa, Fuenterrabía, Monte Jaizkibel, alt. 20 m, 15.IX.1991, on *Phaeographis* sp., J. ETAYO 6244 (Herb. ETAYO).

3.1. ***Cornutispora triangularis*** DIEDERICH et ETAYO sp. nov.

Conidiomata lichenicola, pycnidia, globosa, immersa, 50 - 100 µm in diametro, glabra, pallide rufa, non ostiolata; conidiophora et cellulae conidiogenae difficiliter visibilia; conidia hyalina, non septata, triangularia, incisuris profundis, 11 - 17 µm in diametro, cum 3 appendicis 3 - 4 µm (fig. 3).

Typus: Spain, Navarra, N of Ochagavía, Bosque de Iraty, Lizardoya, on *Fagus*, on *Pertusaria pertusa*, 19.VII.1991, P. DIEDERICH 9664 et J. ETAYO (LG holotypus, Herb. DIEDERICH isotypus).

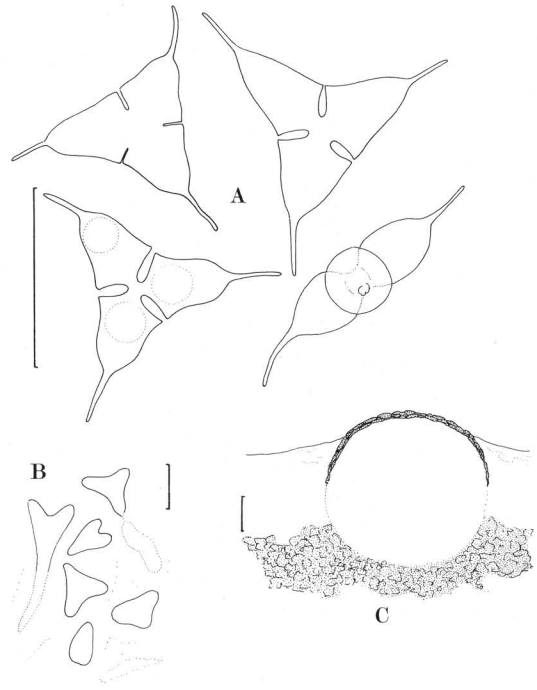

Fig. 3: *Cornutispora triangularis* (J. ETAYO 5969): A conidia; B young conidia formed in a gelatinous matrix; C section through a conidioma, schematic, nucleus not represented (scale: A = 10 µm, B = 5 µm, C = 20 µm)

Conidiomata pycnidial, globose, immersed, 50 - 100 µm in diameter, glabrous, pale brown, lacking an ostiole but dehiscing by disintegration of the upper wall; wall about 5 µm thick, of textura angularis, hyaline, but brownish in the upper part; mycelium immersed; conidiophores and conidiogenous cells not clearly distinguished, even when young; in very young conidiomata the nucleus is filled with a hyaline gelatinous conidial mass; conidia hyaline, aseptate, more or less triangular, with deep incisions in the middle of each side of the triangle, the three ends with an unbranched appendage of 3 - 4 µm, thin-walled, with one guttule in each of the three parts, 11 - 17 µm in diameter (inclusive of the appendages, fig. 3).

Host: *Pertusaria pertusa* (WEIG.) TUCK. The new species has always been found in decolourized pinkish parts of the thallus, generally on gall-like outgrowths of the thallus. It may thus be considered as a parasite. - Distribution: Rare in the western French and Spanish Pyrenees.

Observations: This is a very characteristic lichenicolous Coelomycete, apparently restricted to *Pertusaria pertusa*, with a unique kind of conidia. Although a number of specimes was available, and despite a careful study of conidiomata of different stages of development, we were unable to determine the conidiogenesis. In mature conidiomata, the whole pycnidial cavity is filled with conidia and, even in thin sections, no conidiogenous cells could be recognized. Squash preparations are generally needed for a careful study of single conidia. In young conidiomata, more or less triangular cells could be seen mixed with other cells of an irregular form and size. They may represent young conidia together with conidiogenous cells, both embedded in a dense gelatinous matrix. As the conidiomata of the new fungus strongly resemble those of *Cornutispora lichenicola* D. HAWKSW. et B. SUTT. (HAWKSWORTH 1976, NAG-RAJ 1993), and as the conidia are similar to those of *Cornutispora ciliata* KALB (GIERL and KALB 1993), we describe it here provisionally as a member of the genus *Cornutispora*, although the characteristic septate and branched conidiophores known from that genus, easily visible in squash preparations or in thin sections, could not be detected. Additional specimens studied, all from *Pertusaria pertusa* on *Fagus sylvatica*, total six.

4.1. ***Libertiella leprariae*** ETAYO et DIEDERICH sp. nov.

Conidiomata lichenicola, pycnidia, superficialia, gregaria, subglobosa, aurantiaca, ostiolo rufo, 70 - 100 µm in diametro; conidiophorae cylindricae, hyalinae, levia, 4 - 5 x 2 µm; cellulae conidiogenae enteroblasticae, terminales vel laterales, phia-

lidicae, hyalinae, 6 - 8 x 1.5 - 2 µm; conidia ellipsoidea ad obovoidea, basim truncata, hyalina, non septata, levia, 1.5 - 3 x 1 - 1.5 µm (fig. 4).

Typus: Spain, Navarra, Valle de Bertizarana, Oronoz-Mugaire, Señorío de Bértiz, near Aizcolegui, alt. 700 m, on *Lepraria lobificans*, on *Quercus robur*, 22.VII. 1991, J. ETAYO s. n. et P. DIEDERICH (MA-Lichen holotypus, Herb. ETAYO isotypus).

Conidiomata pycnidia, superficial, with only the base immersed in the host, arising in groups, subglobose, orange, with a darker brownish ostiole, 70 - 100 µm in diameter; wall composed of translucent, slightly orange, prosoplectenchymatous cells; outer part of wall and pycnidial surface (especially around the ostiole) filled with small orange granules that react K+ purple. Conidiophores arising from the inner wall of the pycnidial cavity, more or less cylindrical, hyaline, smooth-walled, 4 - 5 x 2 µm; conidiogenous cells enteroblastic, arising terminally and laterally from the conidiophores, thinner at the apex, phialidic with a short collarette, hyaline, 6 - 8 x 1.5 - 2 µm; conidia abundant, ellipsoid to obovoid, with a slightly truncated base, hyaline, simple, 0-1-guttulate, smooth-walled, 1.5 - 3 x 1 - 1.5 µm (fig. 4).

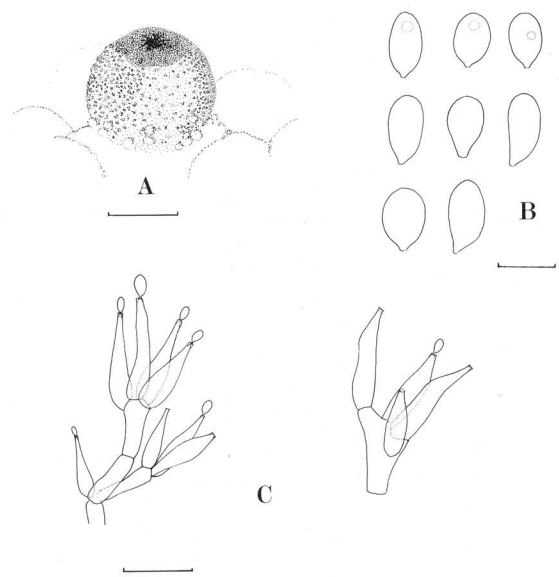

Fig. 4: *Libertiella leprariae* (holotypus): A conidioma; B conidia; C conidiophores and conidiogenous cells (scale: A = 50 µm, B = 2 µm, C = 5 µm)

Host: *Lepraria lobificans* NYL. The thallus turns pinkish in the presence of this parasite. - Distribution: Only known from the type locality in the western Spanish Pyrenees. - Observations: This new fungus is similar to the only previously accepted species of the genus, *Libertiella malmedyensis* SPEG. et ROUM., which differs in having larger pycnidia (150 - 200 µm in diam.), larger conidiogenous cells (10 - 12 x 2 - 3.5 µm) and larger conidia (6 - 8 x 3 - 4 µm), and in growing on a different host, *Peltigera didactyla* [WITH.] LAUND. (HAWKSWORTH 1981).

5.0. *Lichenobactridium* DIEDERICH et ETAYO gen. nov.

Conidiomata sporodochia, immersa vel superficialia, plana, atrorufa; conidiophora semi-macronemata, hyalina, filiformia, ramosa; cellulae conidiogenae holoblasticae, terminales, determinatae, discretae, filiformes, hyalinae, leves; conidia solitaria, sicca, subcylindrica, extremitatibus rotundata, transseptata, levia, hyalina; species holotypica: *Lichenobactridium pertusariae* DIEDERICH et ETAYO.

Conidiomata sporodochia, immersed to superficial, concave or flat, blackish, brown in the lower part, surrounded marginally and often superficially by a brownish granulose layer; conidiophores semi-macronematous, hyaline, filiform, branched; conidiogenous cells holoblastic, terminal, determinate, discrete, filiform, hyaline, smooth; conidia solitary, dry, subcyclindrical, rounded at both ends, transversally septate, smooth, thin-walled, hyaline.

Observations: The new genus strongly resembles *Bactridium* KUNZE. However, in this genus, the conidia are very large (120 - 420 x 30 - 60 µm), the sporodochia are pale or bright coloured, not black, and they are generally convex to subspherical, often stipitate, not flat. We also compared the new fungus with *Lichenopuccinia* D. HAWKSW. et HAF., but in that genus the conidiogenous cells are different, the conidia have a much thicker wall, especially at the apex, and the sporodochia are strongly convex.

5.1. *Lichenobactridium pertusariae* DIEDERICH et ETAYO sp. nov.

Conidiomata lichenicola, sporodochia, atrorufa, plana, 150 - 350 µm in diametro; conidiophora ramosa, 15 - 25 x 1 µm; cellulae conidiogenae filiformia, 10 - 14 x 1 - 1.5 µm; conidia 3 - 4 (-5)-septata, 22 - 26 x 3 - 4 µm (fig. 5).

Typus: France, Pyrénées-Atlantiques, au sud de St-Jean-Pied-de-Port, Forêt d'Iraty, à 0,5 km au sud du Chalet Pedro, alt. 1000 m, on *Fagus*, on *Pertusaria pertusa*, 27.VII.1990, P. DIEDERICH 9219 (LG holotypus, Herb. DIEDERICH isotypus).

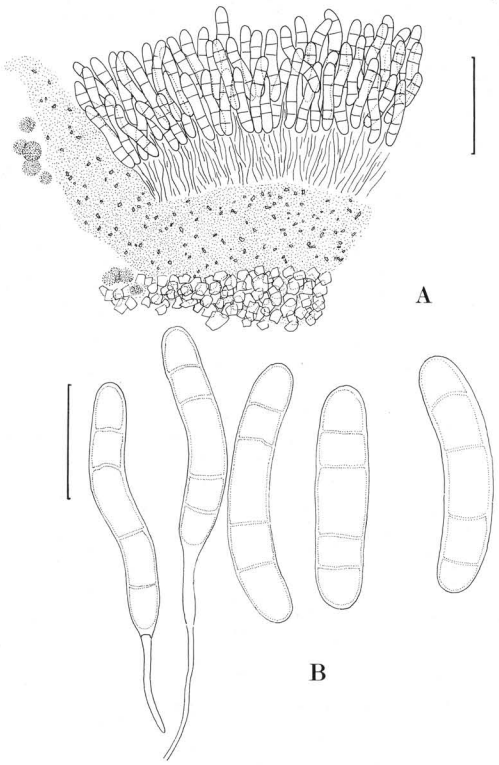

Fig. 5: *Lichenobactridium pertusariae* (holotypus): A section through a sporodochium; B conidia, with parts of conidiogenous cells (left; scale: A = 50 µm, B = 10 µm)

Conidiomata forming dark brown to black flat sporodochia, 150 - 350 µm in diameter, brown in the lower part, surrounded by a 25 - 30 µm thick granulose brownish layer; conidiophores branched, 15 - 25 µm long, 1 µm thick; conidiogenous cells filiform, 10 - 14 x 1 - 1.5 µm; conidia 3 - 4 (-5)-septate, 22 - 26 x 3 - 4 µm (fig. 5).

Host: *Pertusaria pertusa* (WEIG.) TUCK. The sporodochia are first immersed in the thallus, but often get superficial at maturity. - Distribution: Only known from the type locality in the French Pyrénées-Atlantiques.

6.1. ***Phoma lobariae*** DIEDERICH et ETAYO sp. nov.

Conidiomata lichenicola, pycnidia, immersa, erumpescentia, atra, subglobosa, 50 - 100 µm in diametro, ostiolata; conidiophorae desunt; cellulae conidiogenae elongatae, ampulliformes, hyalinae, leves, phialidicae, 4 - 6 x 1.7 - 3.5 µm; conidia subglobosa ad ellipsoidea, basim truncata, hyalina, levia, 3 - 4 x 2.5 - 3 µm (fig. 6).

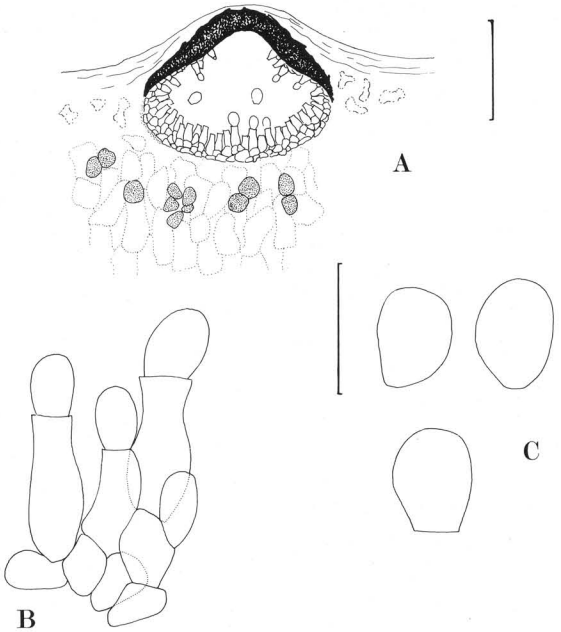

Fig. 6: *Phoma lobariae* (holotypus): A section through a conidioma; B conidiogenous cells with conidia; C conidia (scale: A = 50 µm, B, C = 5 µm)

Typus: France, Pyrénées-Atlantiques, Forêt d'Iraty, à 0,5 km au sud du Chalet Pedro, on *Fagus*, on *Lobaria pulmonaria*, 19.VII.1991, P. DIEDERICH 9694 et J. ETAYO (LG holotypus; IMI, UPS, Herb. DIEDERICH, Herb. ETAYO isotypi); ibid., 27.VII.1990, P. DIEDERICH 9210 (Herb. DIEDERICH topotypus).

Conidiomata pycnidia, at first immersed, the upper third erumpent at maturity, arising singly, blackish, subglobose, 50 - 100 µm in diameter, ostiolate; pycnidial wall composed of 2 - 3 (-5) layers of cells, the outer cells brown, the inner hyaline, 8 - 14 µm thick, around the ostiole distinctly thickened, dark reddish brown and up to 30 µm thick; conidiophores absent; conidiogenous cells arising from the inner wall of the pycnidium, lining the pycnidial cavity, elongate-ampulliform, hyaline, smooth-walled, phialidic, not proliferating, 4 - 6 x 1.7 - 3.5 µm; conidia abundant, subglobose to shortly ellipsoid, often angular due to mutual compression, distinctly truncate at the base, hyaline, smooth-walled, 3 - 4 x 2.5 - 3 µm (fig. 6).

Host: *Lobaria pulmonaria* (L.) HOFFM. The new fungus attacks especially the older parts of the thallus which get brown by the action of the parasite. - Distribution: Very common in the western French and Spanish Pyrenees. - Observations:

The only other lichenicolous species of *Phoma* with almost globose conidia, *P. caloplacae* D. HAWKSW., has larger conidia (5 - 6 µm in diam.) and conidiogenous cells (5 - 6 µm in diam.; HAWKSWORTH 1981). - Fifteen additional samples, all from *Lobaria pulmonaria*, have been included in the observations.

7.0. ***Pycnopsammina*** DIEDERICH et ETAYO gen. nov.
Conidiomata pycnidia, immersa, ostiolata, paries hyalinus, sed rufus prope ostiolum; conidiophora desunt, cellulae conidiogenae monoblasticae, discretae, determinatae, solitares, breviter ampulliformiae, leves; conidia hyalina, levia, digitata, multiseptata; species holotypica: *Pycnopsammina lobariae* DIEDERICH et ETAYO.

Conidiomata pycnidia, immersed in the host thallus, ostiolate, brown around the ostiole, wall hyaline, but brown near the ostiole, composed of several layers of elongate cells; mycelium immersed, hyaline; conidiophores absent; conidiogenous cells lining the inner pycnidial wall, monoblastic, discrete, determinate, solitary, short ampulliform, smooth; conidia hyaline, smooth, consisting of a number of separate, multiseptate, sometimes branched arms radiating from a basal cell.

Observations: The new genus strongly resembles the genus *Psammina* ROUSS. et SACC. by its very characteristic conidia. Nevertheless, *Psammina* clearly differs from our fungus by a different type of conidiomata (acervular or hyphomycetous) and by the presence of filiform conidiophores (HAWKSWORTH 1979, SUTTON 1980). Although open conidiomata of *Pycnopsammina* could be interpreted as a kind of acervuli, they originate from typical pycnidia with a regular multilayered wall and a punctiform ostiole when young. *Sirothecium* KARST. differs by eustromatic conidiomata lacking an ostiole and by brownish conidia (SUTTON 1978). *Digitosporium* GREMM. also differs by conidiomata lacking an ostiole, by the presence of branched conidiophores, and the brownish conidiophores, conidiogenous cells, and conidia (SUTTON 1980).

7.1. ***Pycnopsammina lobariae*** DIEDERICH et ETAYO sp. nov.
Conidiomata lichenicola, 80 - 120 (-170) µm in diameter, rufa prope ostiolum, paries 7 - 12 µm crassus, hyalinus, sed rufus prope ostiolum; ostioli orificium maturitate amplificante et hymenium expositum; cellulae conidiogenae hyalinae, breviter ampulliformes, 3 - 3.5 x 2 - 4 µm; conidia hyalina, levia, digitata, e 5 - 10 ramis separatis, 3-4-septatis, 21 - 27 x 2.5 - 3.5 µm, e cellula basali 5 - 6.5 x 3 - 4.5 µm exortis (fig. 7).

Typus: France, Pyrénées-Atlantiques, au sud de St-Jean-Pied-de-Port, Forêt d'Iraty, à 0,5 km au sud du Chalet Pedro, alt. 1000 m, on *Fagus*, on *Lobaria pulmonaria*, 19.VII.1991, P. DIEDERICH 9697 et J. ETAYO (LG holotypus, Herb. DIEDERICH isotypus).

Conidiomata 80 - 120 (-170) µm in diameter, brown around the ostiole, wall 7 - 12 µm thick, hyaline, but brown near the ostiole, when mature, the ostiolar opening gets larger until the whole hymenium of conidiogenous cells is exposed through a hole in the host cortex; conidiogenous cells hyaline, shortly ampulliform, 3 - 3.5 µm long, 2 - 4 µm wide; conidia hyaline, smooth, consisting of 5 to 10 separate, 3-4-septate, occasionally branched arms of 21 - 27 x 2.5 - 3.5 µm, radiating from a basal cell of 5 - 6.5 x 3 - 4.5 µm (fig. 7).

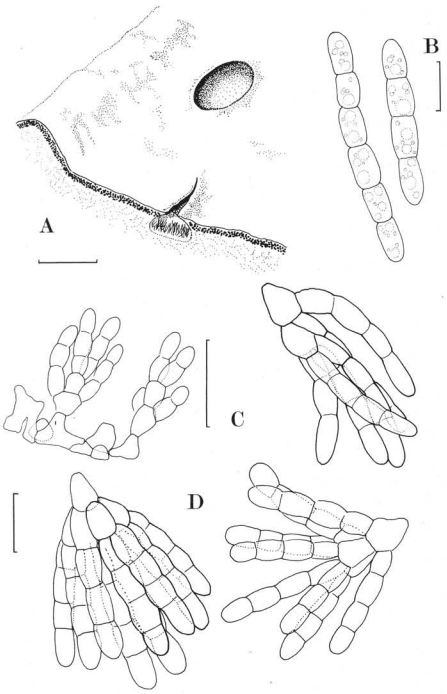

Fig. 7: *Pycnopsammina lobariae* (J. ETAYO 12052): A conidiomata (closed and opened); B two "arms" of a conidium with guttules; C conidiogenous cells with conidia; D three conidia (scale: A = 100 µm, B, C, D = 10 µm)

Host: *Lobaria pulmonaria* (L.) HOFFM. - Distribution: Only known from the western French and Spanish Pyrenees, where the species seems to be rare or overlooked. - Additional specimens: Spain: Alava, Sierra de Entzía, Puerto de Opácua,

near path to Legaire, alt. 940 m, on *Fagus*, on *Lobaria pulmonaria*, 6.IV.1994, J. ETAYO 12052 (Herb. ETAYO); Navarra, W of Pamplona, Sierra de Urbasa, Puerto de Urbasa, on *Fagus*, on *Lobaria pulmonaria*, 20.VII.1991, P. DIEDERICH 9648 et J. ETAYO (Herb. DIEDERICH).

8.1. ***Sclerococcum hawksworthii*** ETAYO et DIEDERICH sp. nov.

Conidiomata lichenicola, sporodochia, rotundata, convexa, superficialia, griseo-fusca, 30 - 100 (-130) µm; conidiophora semi-macronemata, hyalina vel spadicea; cellulae conidiogenae monoblasticae, integratae, terminales, globosae vel ellipsoideae, hyalinae vel spadiceae; conidia catenata, sicca, acrogena, 0-1-septata, globosa ad subglobosa, fusca, levia, 2.5 - 4 µm in diametro (fig. 8 A).

Typus: France, Pyrénées-Atlantiques, Ibarre, near St-Jean-Pied-de-Port, on *Megalospora tuberculosa*, on *Quercus robur*, 25.VI.1992, J. ETAYO 2647 et C. PRINTZEN (MA-Lichen holotypus; Herb. ETAYO isotypus).

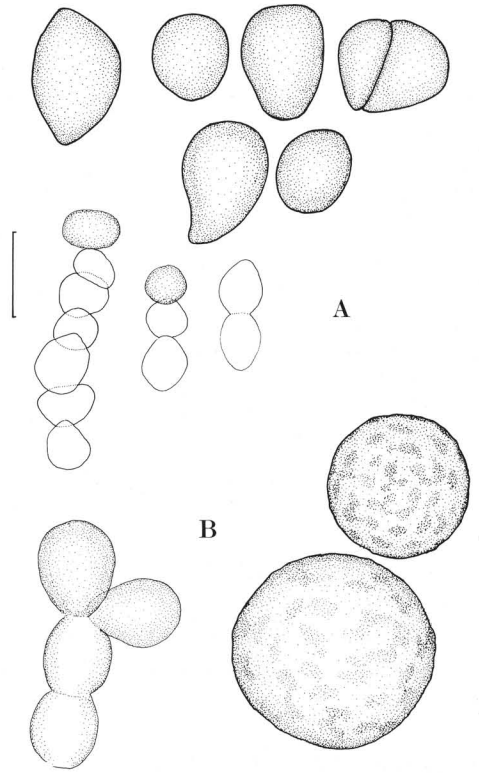

Fig. 8: *Sclerococcum hawksworthii* (holotypus) and *Sclerococcum normandinae* (holotypus): A *S. hawksworthii*, conidia (top), conidiogenous cells and conidia (bottom); B *S. normandinae*, conidia right), chains of conidiogenous cells and conidia (left; scale: A, B = 5 µm)

Colonies forming discrete patches on the thallus of the host, mycelium immersed; conidiophores semi-macronematous, aggregated into tufted, rounded, convex, greyish-brown, simple to aggregated, superficial sporodochia of 30 - 100 (-130) µm in diameter, hyaline or pale brown; conidiogenous cells monoblastic, integrated, terminal, roundish to ellipsoid, hyaline or pale brown, not clearly defined and the terminal cells acting in turn as conidiogenous cells; conidia adhering in chains, dry, acrogenous, simple or rarely 1-septate, globose or subglobose, sometimes with more or less pointed ends, brown, smooth, 2.5 - 4 µm in diameter (fig. 8 A).

Host: *Megalospora tuberculosa* (FÉE) SIPM. The thallus turns yellowish when the fungus is abundant. - Distribution: French and Spanish western Pyrenees, most probably common, but rarely collected due to its small size. - Observations: This species resembles *Sclerococcum simplex* D. HAWKSW. in its non-septate conidia. *S. simplex* differs in having dark brown to black and larger sporodochia (100 - 300 µm), larger conidia (4 - 7 µm in diameter) and different hosts (epiphytic *Pertusaria* spp.: HAWKSWORTH 1979). The differences to *S. normandinae* sp. nov. are discussed under that species. The new species is dedicated to D. L. HAWKSWORTH (Kew) in recognition of his important contributions to the knowledge of lichenicolous Deuteromycetes and especially of the genus *Sclerococcum*. Seven additional samples, all from *Megalospora tuberculosa*, mostly growing on *Fagus sylvatica*, have also been studied.

8.2. ***Sclerococcum normandinae*** DIEDERICH et ETAYO sp. nov.

Conidiomata lichenicola, sporodochia convexa, griseorufa, 150 - 300 µm in diametro; conidiophora semi-macronemata, e catenis conidiis ramosis irregularibus constantia; cellulae conidiogenae monoblasticae vel polyblasticae, integratae, terminales, rufae; conidia catenata, sicca, acrogena, subglobosa ad ellipsoidea, rufa, plerumque non-septata, verruculosa, pariete crasso, 4 - 6 x 3.5 - 4 µm (fig. 8 B).

Type: France, Pyrénées-Atlantiques, au sud de Tardets-Sorholus, Ste-Engrâce, vers Pierre-St-Martin, à 3 km après la dernière maison, on *Fagus*, on *Normandina pulchella*, 26.VII.1990, P. DIEDERICH 9388 (LG holotypus, Herb. DIEDERICH isotypus).

Colonies forming discrete patches on the thallus of the host; mycelium immersed, hyaline to pale brown; conidiophores semi-macronematous, aggregated into tufted, strongly convex, greyish-brown sporodochia of 150 - 300 µm in diameter, mainly consisting of irregular branched conidial chains; conidiogenous cells mo-

noblastic or polyblastic, integrated, terminal, brown, not clearly defined and the terminal cells acting in turn as conidiogenous cells; conidia adhering in chains, dry, acrogenous, subspherical to ellipsoid, brown, simple or very rarely 1-septate, verruculose, thick-walled, 4 - 6 x 3.5 - 4 µm (fig. 8 B).

Host: The sporodochia are commensalistic on *Normandina pulchella* (BORR.) NYL. - Distribution: We have collected this species at three localities in the French Pyrénées-Atlantiques and once in Navarra. - Observations: We describe this species with some hesitation in the genus *Sclerococcum*. Indeed, the whole sporodochium consists only of richly branched conidial chains. In microscopical sections, no distinct conidiophores can be recognized, and no stromatical tissue is present. In squash preparations, the conidial chains break into small chains consisting just of two to four conidia. We consider that the conidiophores consist of these branched conidial chains, a structure that resembles strongly what has been illustrated by HAWKSWORTH (1979) for *Sclerococcum simplex*. The new species is easily distinguished from *S. hawksworthii* and *S. simplex* by the distinctly verruculose conidia, similar to those of *Lichenoconium lecanorae*, from *S. simplex* in addition by the brownish and not blackish sporodochia, and from *S. hawksworthii* by the larger sporodochia and conidia.

9.1. ***Spilodochium parmotrematis*** DIEDERICH et ETAYO sp. nov.

Conidiomata lichenicola, sporodochia, superficialia, convexa, atrorufa, 75 - 150 (-250) µm in diametro; conidiophora stromatica, atrorufa; cellulae conidiogenae monoblasticae, integratae, terminales, determinatatae, subglobosae ad ellipsoideae, atrorufae; conidia acrogena, sicca, catenata, non-septata, ellipsoidea, atrorufa, valde verrucosa, 0 (-1)-septata, 7 - 13 x 4 - 6 µm (fig. 9).

Typus: France, Pyrénées-Atlantiques, Forêt d'Iraty, à 0,5 km au sud du Chalet Pedro, on *Fagus*, on *Parmotrema arnoldii*, 27.VII.1990, P. DIEDERICH 9227 (LG holotypus, Herb. DIEDERICH, Herb. ETAYO isotypi).

Conidiomata sporodochia, superficial, convex, dark reddish-brown, 75 - 150 (-250) µm in diameter, mycelium immersed; conidiophores stromatic, dark brown, conidia arising directly from the cells of stromata and forming sporodochia; conidiogenous cells monoblastic, integrated, terminal, determinate, subspherical or ellipsoidal, dark brown; conidia acrogenous, dry, in branched chains, simple, ellipsoidal, (dark) brown, strongly verrucose, 0 (-1)-septate, 7 - 13 x 4 - 6 µm (fig. 9).

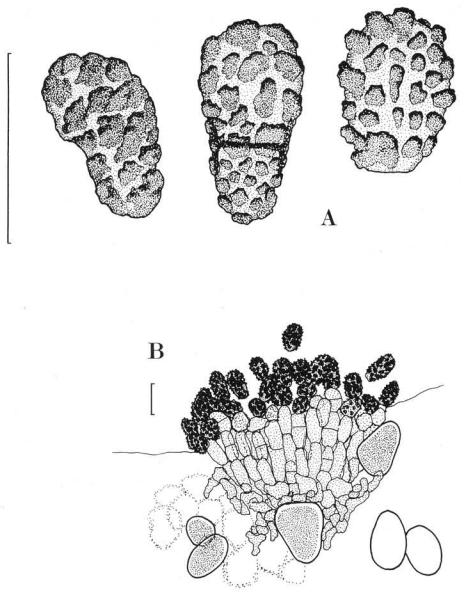

Fig. 9: *Spilodochium parmotrematis* (holotypus): A conidia; B section through a sporodochium (scale: A, B = 10 µm)

Host: *Parmotrema arnoldii* (DU RIETZ) HALE (parasymbiotic on the thallus). - Distribution: Only known from the type locality in the French Pyrénées-Atlantiques. - Observations: The new fungus is similar to the type species of the genus, *Spilodochium vernoniae* SYD., which differs in having larger, and especially broader, often 1-septate conidia, and in being not lichenicolous (ELLIS 1971).

Acknowledgments

The authors wish to thank Dr. E. SÉRUSIAUX (Liège) for reading and commenting on the manuscript. The first author is indebted to the DGICYT (Madrid) for a grant assigned to the project PB89-0518-C02-01.

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Received: October 6th, 1994
Accepted: October 25th, 1994

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