

## Foliicolous lichens from French Guiana (northeastern South America)

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**Abstract – Foliicolous lichens from French Guiana (northeastern South America).** Based on collections made by the author in 1995 at four localities (Nouragues, Saül, Paracou, Piste de St. Elie), 213 species of foliicolous lichens are reported from French Guiana. These include four species new to science: *Byssolema fuscohallinum* Lücking sp.n., *Mazosia uniseptata* Lücking sp.n., *Trichothelium confusum* Lücking sp.n., and *T. pallidum* Lücking sp.n. In addition, the new combination *Stigmatidium concentricum* (J. L. Bezerra & Cavalc.) Lücking comb.n. [bas.: *Scutomyces concentricus* J. L. Bezerra & Cavalc.] is proposed, and this taxon is suggested to be truly lichenized. Further seven species in the genera *Actinoplaca*, *Aderkomyces*, *Aulaxina*, *Fellhanera*, *Kantvilasia*, *Mazosia*, and *Tricharia*, are discussed as possibly new, but without formal descriptions due to the scanty material. A total of 136 taxa are new records for French Guiana, raising the number of foliicolous lichens known for this French overseas department to 224 and the total number of lichen species to 382. Five names are deleted from the checklist for French Guiana: *Porina albicera* (Kremp.) Overeem (possible misidentification of *P. andreana*), *P. applanata* Vain. (misidentification of *P. pseudoapplanata*), *P. pseudofulvella* Sérus. (= *P. rufula*), *P. verruculosa* Müll. Arg. (misidentification of *P. guianensis* f. *pentaseptata*) and *Trichothelium alboatrum* Vain. (misidentification of *T. sipmanii*). In terms of foliicolous lichens, about 70% of the species known from French Guiana are shared with Guyana, a similar percentage as is found in non-foliicolous taxa. It is assumed that this proportion will probably increase to about 90% when more data are becoming available. © ADAC / Elsevier, Paris

**Guianas / Guiana Shield / Guyana / Guayana Highlands / new species / Surinam**

### INTRODUCTION

The Guianas form a group of three adjacent countries in the northernmost part of South America and, together with the eastern part of Venezuela and small parts of Colombia and Brazil, make up the Guayana Highlands or Guiana Shield, one of the most ancient geological formations on the American continent (Gansser, 1954; McConnell & Choubert, 1975). The Guianas exhibit a high degree of endemism in terms of their vascular plant flora, although their forests are relatively poor in species compared to the Central American, Amazonian, and Atlantic rainforest (Takhtajan, 1986 ; Lindeman & Mori, 1989; Steege, 1998; Kelloff & Funk, 2004). Several recent inventory projects have been or are dealing with the Guianas, including the *Biological Diversity of the Guiana Shield* program by the Smithsonian Institution ([www.mnh.si.edu/biodiversity/bdg/index.html](http://www.mnh.si.edu/biodiversity/bdg/index.html)), the *Plant Diversity of the Guianas* project by the University of Utrecht ([www.bio.uu.nl/~herba/Guyana/Plant\\_Diversity\\_Guyana/index.htm](http://www.bio.uu.nl/~herba/Guyana/Plant_Diversity_Guyana/index.htm)), the *Herbier de Guyane* in Cayenne, French Guiana ([www.cayenne.ird.fr/aublet2/](http://www.cayenne.ird.fr/aublet2/)



[aublet2.html](#)), and the *Fungal and Plant Diversity of Central French Guiana* website by the New York Botanical Garden ([www.nybg.org/bsci/french\\_guiana/french\\_guiana/french\\_guiana.html](http://www.nybg.org/bsci/french_guiana/french_guiana/french_guiana.html)). More than 9,000 vascular plant species have been reported from the area (Boggan *et al.*, 1997; Hollowell *et al.*, 2001), with the highest number reported from Guyana and the lowest from Surinam.

The lichen biota of the Guianas is less well-known. Only few historical treatments exist (Meyer, 1818; Fée, 1824; Montagne, 1843, 1851; Wächter, 1897; Masee, 1901), and the first modern work that mentions lichens from the area is Santesson's (1952) monograph on foliicolous lichens. Apart from the description of *Phyllopsora leprosa* from Surinam by Riedl (1973), interest in the lichen biota of the Guianas started to increase significantly only in the mid eighties. Since then, several floristic and taxonomic papers were published (Aptroot, 1987a; Sipman, 1990, 1991, 1994, 1997; Egea & Aptroot, 1992; Sipman & Aptroot, 1992; Sipman & Van Aubel, 1992; Lindström, 1993; Aptroot & Van Aubel, 1999; Kashiwadani *et al.* 2001; Schultz *et al.* 2001), and two monographic works dealt with the *Pyxinaceae* (= *Physciaceae*) and the *Trichotheliaceae* (= *Porinaceae*; Aptroot, 1987b; Aptroot & Sipman, 1993). In addition, quite a number of floristic and taxonomic studies of larger, or different, geographical areas included new lichen taxa or new records for the Guianas (Harris, 1995; Lücking & Sérusiaux, 1996; Lücking *et al.* 1997; Etayo & Lücking, 1999; Ferraro & Lücking, 1999; Lücking & Cáceres, 1999; Lücking & Kalb, 2000; Herrera-Campos & Lücking, 2003), and the Guianas were also covered by recent world-wide or regional monographs of selected taxa (Brako, 1991: *Phyllopsora*; Arvidsson, 1982: *Coccocarpia*; Staiger & Kalb, 1995: *Haematomma*; Elix, 1996: *Relicina*; Matzer, 1996: lichenicolous fungi on foliicolous lichens; McCarthy & Elix, 1996: *Myeloconis*; Lücking & Vezda, 1998: *Porina*; Ahti, 2000: *Cladoniaceae*; Kalb *et al.*, 2000: *Bapalmuia*; Marbach, 2000: *Buellia s.lat.*; Jørgensen & Arvidsson, 2002: *Erioderma*; Staiger, 2002: *Graphidaceae*; Sérusiaux & Lücking, 2003: *Caprettia*; Lücking & Cáceres, 2004: *Trichothelium*; Sparrius, 2004: *Enterographa* and *Sclerophyton*; Lücking, 2006: foliicolous lichens). A small project on the *Graphidaceae* of Central French Guiana was started by R. Yahr ([www.nybg.org/bsci/french\\_guiana/graphidaceae.html](http://www.nybg.org/bsci/french_guiana/graphidaceae.html)), including keys to genera and selected species. A few studies with ecological focus were also performed (Cornelissen & Ter Steege, 1989; Büdel *et al.*, 2000; Schultz *et al.*, 2000).

The first checklist of lichens from the Guianas was published by Hekking & Sipman (1988), listing 364 taxa. Two updated online versions of the checklist are currently available: from the Smithsonian Institution, compiled by H. Sipman ([www.mnh.si.edu/biodiversity/bdg/guilich3.html](http://www.mnh.si.edu/biodiversity/bdg/guilich3.html)), and from the University of Hamburg, compiled by T. Feuerer ([www.biologie.uni-hamburg.de/checklists/portalpages/world\\_1.htm](http://www.biologie.uni-hamburg.de/checklists/portalpages/world_1.htm)). The first lists a total of 598 taxa, with the highest number reported from Guyana (528), followed by French Guiana (238) and Surinam (100). The second checklist has slightly lower figures, with 515, 237, and 99 taxa, respectively. Some of the differences are explained by double entries in Sipman's list, such as *Arthonia palmulacea* versus *Eremothecella palmulacea*, which both represent the same species.

According to Sipman's checklist, 67 taxa are shared between all three countries, 102 between Guyana and French Guiana, 19 between Guyana and Surinam, and 12 between Surinam and French Guiana. These figures clearly show significant gaps in the knowledge of the lichen biota of especially Surinam and French Guiana; for example, it can be safely assumed that the 102 taxa reported for Guyana and French Guiana also occur in Surinam. Nevertheless, the notion that the Guianas are generally poorer in species than Central America, the



Amazon region, and the Atlantica rainforest, seems also to be true for lichens, and the total number of lichen species for the area is probably somewhere between 1,000 and 1,500. For comparison, about 2,400–3,000 lichen species are estimated to occur in Costa Rica (Lücking *et al.*, 2004), which covers only ten percent of the area of the Guianas. Current information on the lichen biota of the Guianas is available online at both the Smithsonian Institution ([www.mnh.si.edu/biodiversity/bdg/lichlist.html](http://www.mnh.si.edu/biodiversity/bdg/lichlist.html)) and the Botanical Garden and Botanical Museum Berlin ([www.bgbm.fu-berlin.de/sipman/keys](http://www.bgbm.fu-berlin.de/sipman/keys)). The Smithsonian website also include an online key to the genera of lichens found in the Guianas, compiled by H. Sipman ([www.mnh.si.edu/biodiversity/bdg/lichkey3.html](http://www.mnh.si.edu/biodiversity/bdg/lichkey3.html)).

Foliicolous lichens are a significant component of the lichen diversity in lowland and lower montane rainforests (Lücking, 2001), which make up most of the forest formations in the Guianas. It is estimated that any given lowland rainforest site may shelter 300–600 lichen species, half of which are foliicolous taxa. Since the Guianas also include vegetation types other than rainforest, which are poor in foliicolous but diverse in other lichen taxa, the total number of lichen species can be assumed to be three to four times higher than that of the foliicolous species. Detailed knowledge on the foliicolous lichen biota of the Guianas is therefore useful to estimate total lichen diversity. For example, Lücking (1998a) reports a total of 280 foliicolous lichens for Guyana, which makes up little more than half of the total number of lichen species known from that country and suggests that the real number is somewhere between 800 and 1,100.

With regard to French Guiana, Santesson (1952) mentions only 44 foliicolous lichen species for the country. Further records, including several new species, were added by Arvidsson (1982), Sipman (1990), Aptroot & Sipman (1993), Lücking & Sérusiaux (1997), Lücking *et al.* (1997), and Lücking & Vezda (1998). The aforementioned online checklist by Sipman lists 76 taxa, to which should be added *Flavobathelium epiphyllum*, *Musaespora kalbii*, *Porina guianensis*, *P. guianensis* f. *pentaseptata*, and *P. mirabilis*. On the other hand, five names must be deleted from the list, viz. *Porina albicera* (Kremp.) Overeem (possible misidentification of *P. andreana*, which must be added to the list), *P. applanata* Vain. (misidentification of *P. pseudoapplanata*), *P. pseudofulvella* Sérus. (= *P. rufula*), *P. verruculosa* Müll. Arg. (misidentification of *P. guianensis* f. *pentaseptata*, which has to be added to the list) and *Trichothelium alboatrum* Vain. (misidentification of *T. sipmanii*, which has to be added to the list). This gives a total of 79 taxa of foliicolous lichens reported from Guiana before this study, making up about one third of all lichens known from this overseas department of France.

## THE FOLICOLOUS LICHEN BIOTA OF FRENCH GUIANA

The present paper reports 213 foliicolous lichens species for French Guiana, based on collections made by the author in 1995 at four different localities (Fig. 1). Of these, four species are new to science (Fig. 2, 4) and one new combination is proposed (a possibly lichenized *Stigmidium*; Fig. 3); another seven (Fig. 3, 4) are discussed as possibly new but too scanty for formal description, and 136 are new records for this French overseas department. Thus, the number of foliicolous lichens now known from French Guiana amounts to 224, and the total number of lichen taxa to 382.



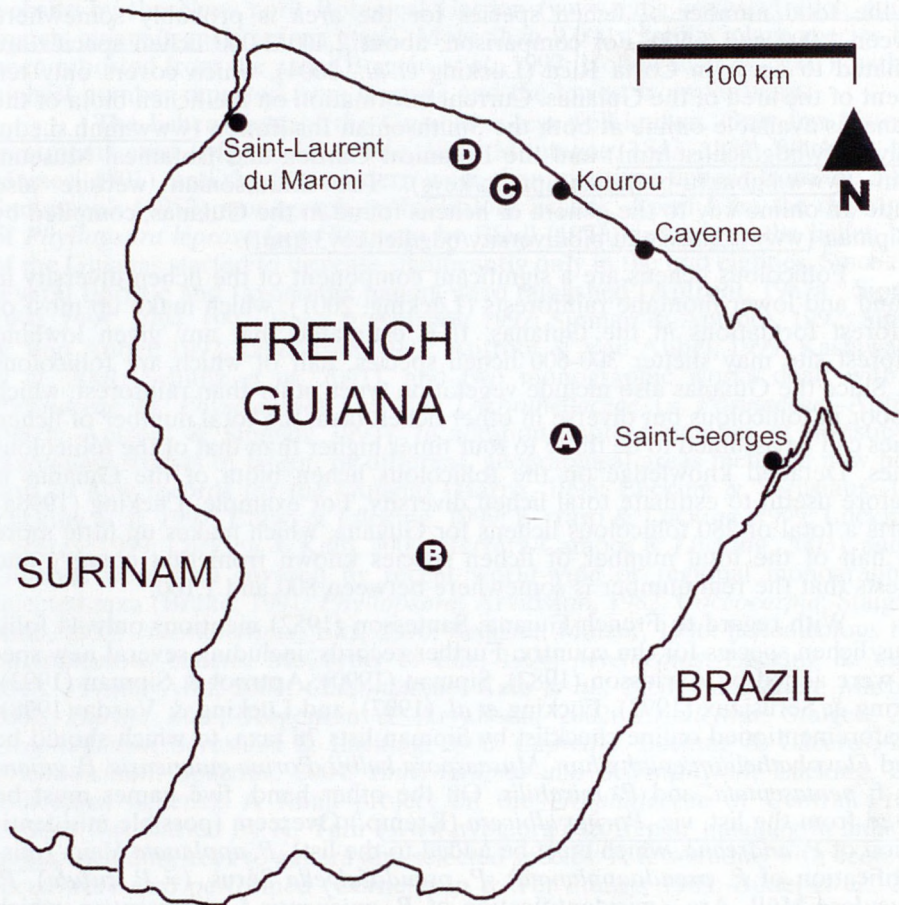


Fig. 1. Geographic situation of the four collecting sites in French Guiana. A. Canton Approuague-Kaw: *Nouragues Field Station* (CNRS), 110 km SSW of Cayenne,  $4^{\circ} 01' N$ ,  $52^{\circ} 33' W$ , 50-250 m, tropical lowland rainforest in hilly region. B. Canton Maripasoula: *Saül Field Station* (ORSTOM), 175 km SW of Cayenne,  $3^{\circ} 38' N$ ,  $53^{\circ} 12' W$ , 200 m, tropical lowland rainforest in hilly region. C. Canton Sinnamary: *Paracou Field Station* (CIRAD), 80 km NW of Cayenne and 35 km NW of Kourou near Sinnamary,  $5^{\circ} 19' N$ ,  $52^{\circ} 55' W$ , 25 m, tropical lowland rainforest, partly intermingled with experimental reforestation plots. D. Canton Sinnamary: *Piste de St. Elie Field Station* (ORSTOM), 95 km NW of Cayenne and 47 km NW of Kourou near Sinnamary,  $5^{\circ} 20' N$ ,  $53^{\circ} 02' W$ , 50 m, tropical lowland rainforest along road.

A comparison with the foliicolous lichen biota of Guyana (Lücking, 1998a) shows that about 160 taxa are shared between both regions, which corresponds to slightly more than 70% of the total number reported for French Guiana; this is almost the same value as for non-foliicolous taxa, according to Sipman's internet checklist. Comparison of the foliicolous lichen biota of the Brazilian Atlantic rainforest with the Amazon and the Central American rainforest (including the Colombian Chocó) showed similarity values of 73-87% (Cáceres *et al.*, 2000). One would therefore expect that the foliicolous lichen biota



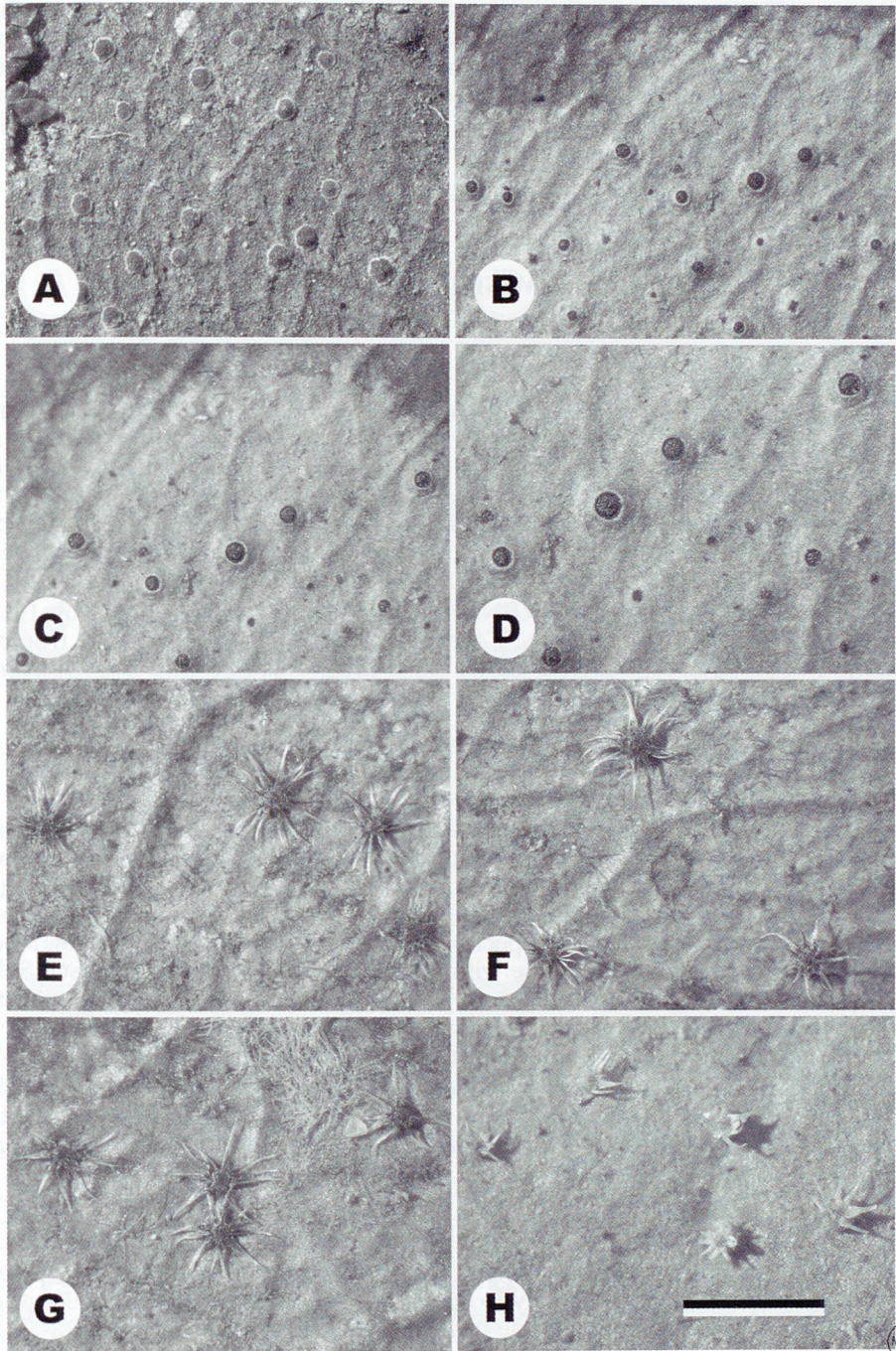


Fig. 2. Habit of foliicolous lichen species. A: *Byssoloma fuscothallinum* sp.n. (holotype). B-D: *Mazosia uniseptata* sp.n. (holotype). E-G: *Trichothelium confusum* sp.n. (holotype). H: *Trichothelium pallidum* sp.n. (holotype). Scale for A, C-D, and H = 2 mm, for B = 3 mm, for E-G = 1.5 mm.



of the three Guianas share at least about 90% of their species, which means that the presently known value of 70% between French Guiana and Guyana reflects insufficient knowledge rather than genuine biogeographical differences. It is then estimated that the total number of species for each of the three Guianas is close to 300 and, assuming 10% of unique taxa for each region, the total number for the whole Guianas would be about 400.

### NEW OR OTHERWISE INTERESTING SPECIES

#### *Actinoplaca* aff. *strigulacea* Müll. Arg.

This taxon is known to me from several collections throughout the Neotropics. It has the same thallus and apothecial morphology and anatomy as *Actinoplaca strigulacea* and *Echinoplaca pellicula*, but features a strange type of hyphophores. These are flask-shaped and sessile on the thallus, pale yellowish to orange-yellow and made of dense, parallel hyphae. Diahyphae are not apparent, but the structures make the impression of functionally derived hyphophores that serve as isidia, very much like the thlasidia in *Jamesiella* (Lücking *et al.*, 2005).

Specimen examined: FRENCH GUIANA. Maripasoula: Saül Field Station (ORSTOM), 175 km SW of Cayenne, 3° 38' N, 53° 12' W, 200 m, tropical lowland rainforest in hilly region, on leaves at forest margin, May 1995, Lücking 95-1548 (hb. Lücking).

#### *Aderkomyces* aff. *albostrigosus* (R. Sant.) Lücking, Sérus. & Vezda

Ill.: Fig. 3C-D (habit), 4E (ascospores).

This is a new species characterized by smooth thallus, clavate, white setae strongly incrustated with crystals in their upper part, sessile, pale yellowish brown apothecia, and 2-4 submuriform ascospores 15-20 × 8-12 µm in size. The single thallus carries only two apothecia, which is not sufficient for a formal description, however. The apothecia of this species resemble those of *Aderkomyces albostrigosus*, but that species has setae without crystals and single-spored asci. Submuriform ascospores are found in *A. subalbostrigosa*, which differs by its uneven- verrucose and non-crystalline setae.

Specimen examined: FRENCH GUIANA. Sinnamary: Paracou Field Station (CIRAD), 80 km NW of Cayenne and 35 km NW of Kourou near Sinnamary, 5° 19' N, 52° 55' W, 25 m, tropical lowland rainforest, partly intermingled with experimental reforestation plots, on leaves in understory, May 1995, Lücking 95-1321 (hb. Lücking).

#### *Aulaxina* aff. *intermedia* Lücking

The present collection differs in the shorter, 3-5-septate ascospores. However, the material is too scanty to decide whether this is a specific feature of falls within the variational amplitude of *Aulaxina intermedia*.

Specimen examined: FRENCH GUIANA. Maripasoula: Saül Field Station (ORSTOM), 175 km SW of Cayenne, 3° 38' N, 53° 12' W, 200 m, tropical lowland rainforest in hilly region, on leaves at forest margin, May 1995, Lücking 95-1558 (hb. Lücking).



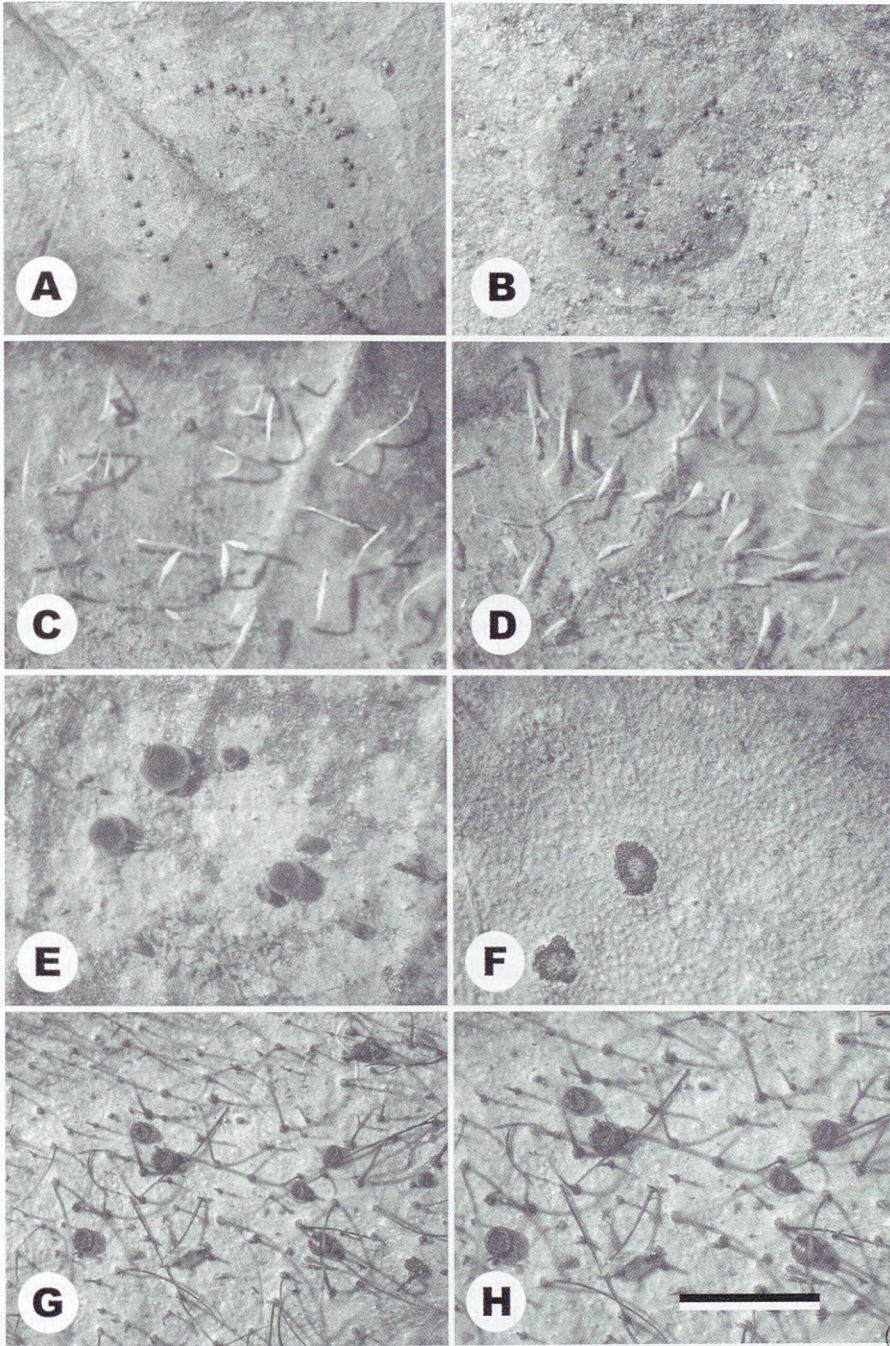


Fig. 3. Habit of foliicolous lichen species. A. *Stigmidium concentricum* comb.n. (95-1103). B: *Microtheliopsis uniseptata* (Australia, Streimann 53983A). C-D. *Aderkomyces* aff. *albostrigosus* (95-1321). E. *Felphanera* aff. *pauciseptata* (95-1378). F. *Mazosia* aff. *aprootii* (95-1615). G-H. *Tricharia* aff. *urceolata* (95-1581). Scale for A-B and H = 1.5 mm, for C-E = 1 mm, for F-G = 2 mm.



***Badimia montoyana* Lücking**

The present material agrees morphologically and anatomically with the populations from Cocos Island (Lücking & Lücking, 1995), but a chemical analysis is needed for sure identification.

Specimens examined: FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1105 (hb. Lücking).

***Byssoloma fuscothallinum* Lücking sp.n.**

Sicut *Byssoloma abscondito* sed thallo et apotheciis fuscis excipulo K+ aurantiaco differt.

Type. FRENCH GUIANA. Sinnamary: Piste de St. Elie Field Station (ORSTOM), 95 km NW of Cayenne and 47 km NW of Kourou near Sinnamary, 5° 20' N, 53° 02' W, 50 m, tropical lowland rainforest along road, on leaves in understory, May 1995, Lücking 95-1395 (CAY, holotype; hb. Lücking, isotype). – Ill.: Fig. 2A (habit), 4A (ascospores).

Thallus foliicolous, epiphyllous, crustose, continuous, 5-20 mm across and 10-15 µm thick, smooth, dark brown. Phycobiont chlorococcoid, cells globose, 4-8 µm diam. Apothecia adnate, rounded to slightly irregular in outline, 0.2-0.3 mm diam. and 80-120 µm high; disc at first plane, pale brown, in mature apothecia convex and rather dark brown; margin byssoid, at first thin but in mature apothecia distinct, although not spreading laterally over thallus surface, chamois-coloured to whitish. Excipulum made of loosely intricate hyphae, 20-30 µm broad, pale greyish brown due to sparse inspersion with crystals, K+ bright yellow. Hypothecium 10-15 µm high, brown, K- to K+ yellowish brown; apothecial base very dark brown to blackish brown, K- or K+ blackish; epithecium indistinct, colourless. Hymenium 50-60 µm high, colourless. Asci clavate, 35-45 × 10-12 µm. Ascospores 8 per ascus, oblong-ellipsoid, 1-septate, with slight constrictions at septum, 8-11 × 2-2.5 µm, 3.5-4 times as long as broad, colourless. Pycnidia not observed.

This new species has also been found in material from Colombia (Lücking 2006). *Byssoloma fuscothallinum* resembles *B. absconditum* Farkas & Vezda in the 1-septate ascospores and apothecia with thin margin, but the latter has pale yellowish brown apothecia with K- excipulum and a pale greenish grey thallus. The hypophyllous *B. hypophyllum* has paler apothecia and an almost invisible thallus. The mentioned species belong in a group together with *B. minutissimum* Kalb & Vezda and *B. aurantiacum* Kalb & Vezda, the latter two having 3-septate ascospores.

***Calenia triseptata* Zahlbr.**

The abundant material from Saül features numerous short setae (sterile hyphophores?), thus far unknown in this species. The setae are about 0.2 mm long and 12-17 µm broad at their base, entirely pale or apically darkened. About 20 setae from different individuals were screened for diahyphae, but in vain.

Specimens examined: FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1113 (CAY). Sinnamary: Piste de St. Elie Field Station (ORSTOM), 95 km NW of Cayenne and 47 km NW of Kourou near Sinnamary, 5° 20' N, 53° 02' W, 50 m, tropical lowland rainforest along road, on leaves in



understory, May 1995, Lücking 95-1342 (F). Maripasoula: Saül Field Station (ORSTOM), 175 km SW of Cayenne, 3° 38' N, 53° 12' W, 200 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1448 (hb. Lücking).

***Fellhanera* aff. *pauciseptata* (R. Sant.) Lücking**

Ill.: Fig. 3E (habit).

With its dispersed, smooth, greyish thallus and dark brown apothecia with thin, greyish margin, this taxon closely resembles *Calopadia phyllogena* and would have been mistaken for this or another species of that genus, were not the small, 3-septate ascospores and the typical *Fellhanera*-anatomy of the apothecia (paraplectenchymatous, small-celled excipulum, anastomosing paraphyses). There is a chance that it deals with an aberrant form of either *F. pauciseptata* or *F. dispersa* Lücking. The former has 1-2-septate ascospores, but this might be an aberrant condition of a regularly 3-septate species, and its apothecia have a more reddish brown disc. *F. dispersa* has pinkish to reddish brown apothecia with a thicker, more irregular margin.

The same taxon was also found in material from Guyana, listed as *Fellhanera* cf. *dispersa* (Lücking, 1998a).

Specimen examined: FRENCH GUIANA. Sinnamary: Piste de St. Elie Field Station (ORSTOM), 95 km NW of Cayenne and 47 km NW of Kourou near Sinnamary, 5° 20' N, 53° 02' W, 50 m, tropical lowland rainforest along road, on leaves in understory, May 1995, Lücking 95-1378 (hb. Lücking).

***Kantvilasia* aff. *hians* McCarthy, Elix & Sérus.**

The scanty material consists of two small thalli composed of whitish, dispersed patches bearing few, blackish campylidia. The conidia are ellipsoid to lemon-shaped, non-septate, 5-6 × 2.5-3 µm. Thus far, the only genus having such a combination of thallus, campylidia, and conidia is *Kantvilasia hians*, a species known from the temperate rainforests of Chile, Argentina, and Tasmania (McCarthy *et al.*, 2000; Lücking & Santesson, 2002; Lücking *et al.*, 2003; Lücking, 2006). Another similar taxon is *Byssoloma citricola* (Maubl.) Lücking *et al.* (2002), which resembles *Kantvilasia* morphologically but produces larger, 1-septate conidia. In the absence of apothecia, no definite statement can be made on the taxonomic position of the present collection.

Specimen examined: FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1568 (hb. Lücking).

***Mazosia uniseptata* Lücking sp.n.**

Sicut *Mazosia pilosa* sed thallo pilis minoribus instructis et ascosporis 1-septatis minoribus differt.

Type. FRENCH GUIANA. Approuague-Kaw : Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1172 (CAY, holotype). – Ill.: Fig. 2B-D (habit), 4B (ascospores).

Thallus foliicolous, epiphyllous, crustose, continuous, 10-20 mm across and 7-12 µm thick, sparsely and minutely pilose, pale greenish grey to pale green, matt; hairs formed by single, unbranched hyphae, 30-70 µm long and 3-5 µm broad at the base, colourless. Phycobiont a species of *Phycopeltis*, cells angular-rounded,



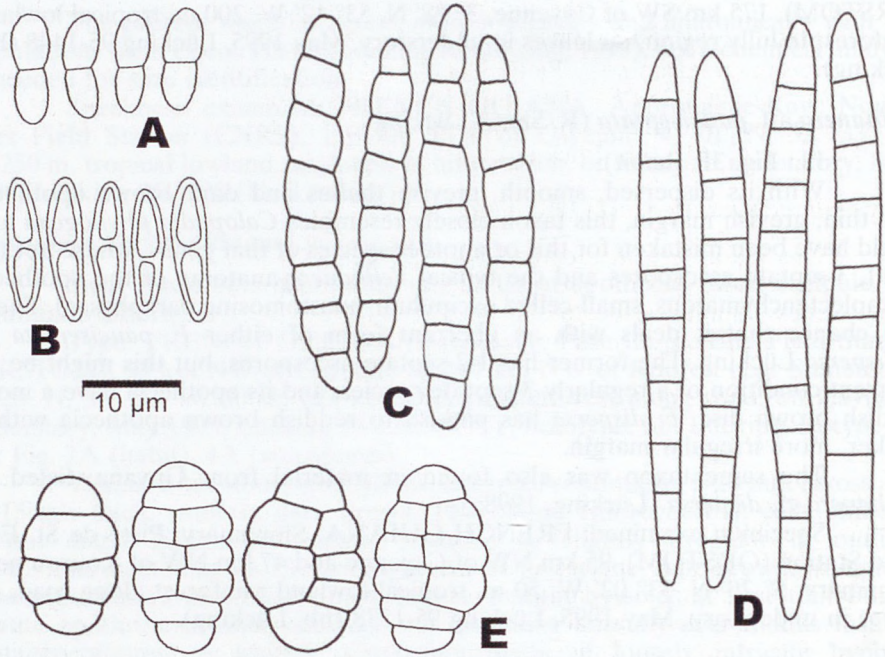


Fig. 4. Ascospores of foliicolous lichen species. A: *Byssoloma fuscohallinum* sp.n. (holotype). B: *Mazosia uniseptata* sp.n. (holotype). C: *Trichothelium confusum* sp.n. (holotype). D: *Trichothelium pallidum* sp.n. (holotype). E: *Aderkomyces* aff. *albostrigosus* (95-1321).

7-13 × 4-6 µm, in irregular plates. Apothecia immersed-erumpent, rounded, 0.2-0.4 mm diam. and 60-80 µm high; disc black, slightly translucent when moistened; margin gently sloping outwards, of the same colour as the thallus. Excipulum 15-25 µm thick, its inner parts pale. Hypothecium 10-15 µm high, colourless to pale sordid green. Hymenium 50-70 µm high. Asci 45-65 × 8-12 µm. Ascospores 8 per ascus, fusiform to oblong, 1-septate, with a very slight constriction at the septum, 10-14 × 3-4 µm, 3-3.5 times as long as broad, colourless. Pycnidia not observed.

At first glance, *Mazosia uniseptata* recalls a depauperate *M. pilosa*, due to the very thinly pilose thallus and the small apothecia, or a young *M. phyllo-sema*, since the short hairs are easily overlooked. The small, 1-septate ascospores, however, make this species unique among lichenized representatives of the genus; similar ascospores are only known from the lichenicolous *M. adelphoparasitica* Matzer (1996), which can be found on thalli of *M. rotula*. *Mazosia uniseptata* is a genuine lichen; the apothecia are distinctly larger than those of *M. adelphoparasitica*, and no other apothecia are present on the thallus.

#### *Mazosia* aff. *aprootii* Sipman

Ill.: Fig. 3F (habit).

Another new species which, however, cannot be described formally due to the scanty material. The species is characterized by its pilose thallus, the hairs being irregularly branched like those of *Mazosia tomentifera* Vezda & Lumbsch



and *M. aptrootii* Sipman. The material differs from the first by its verrucose thallus, from the second by its larger, pale verrucae, and from both by its 3-septate, rather long (30-35  $\mu\text{m}$ ) ascospores).

Specimen examined: FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1615 (hb. Lücking).

*Sporopodium aurantiacum* (Müll. Arg.) Lücking

This taxon was included in *Sporopodium phyllocharis* (Mont.) Massal. and as such reported from French Guiana by Santesson (1952). Because of its orange-yellow thallus and apothecia and different chemical profile, it was reinstated as a distinct species by Lücking (1999, 2006).

*Stigmatidium concentricum* (J. L. Bezerra & Cavalc.) Lücking comb.n.

Ill.: Fig. 3A-B (habit).

*Scutomyces concentricus* J. L. Bezerra & Cavalc. in Cavalcante *et al.*, Publ. Inst. Micol. Univ. Fed. Pern. 675: 9-10 (1972). – Type: BRAZIL. Amazonas: Manaus, May 1961, Garnier 15833 (URM 23644, holotype; INPA, isotype).

This enigmatic species has puzzled me (and others) for a long time. Originally described as a separate genus of lichenized fungi by Cavalcante *et al.* (1972), it was considered an aberrant form of *Microtheliopsis uleana* by Lücking *et al.* (1998). Later, an undescribed species of *Microtheliopsis*, resembling *Scutomyces concentricus* in the small, concentrically arranged perithecia and the 1-septate ascospores, was found in tropical Africa and Australia (Lücking *et al.*, 2001) and eventually described as *Microtheliopsis uniseptata* Herrera-Campos & Lücking, based on material from Mexico (Lücking, 2006). Both differ mainly in ascospore details: rather broad and greyish brown in *M. uniseptata*, and narrow and hyaline in the type material of *Scutomyces concentrica*. Restudy of the latter suggested that it deals with a species of *Stigmatidium*, related to *S. porinae* Matzer (1996).

In the meanwhile, I had access to a few more, well-developed collections of the presumed *Stigmatidium* from the Neotropics, including a nice sample from French Guiana. All specimens are very uniform in their morphology and anatomy. The perithecia are extremely small (up to 0.1 mm diam.), lens-shaped and usually elongate in radiate direction, and dark greyish brown to almost black; they are always (no exception!) concentrically arranged on the thalli. The peridium *sensu* Matzer (1996) is very much reduced and hyaline; instead, the perithecia are covered with a single layer of darker pigmented (dead?) algal cells (the raised thallus), very much like in *Microtheliopsis*; dark brown hyphae are visible laterally between these algal cells. The hamathecium reacts I– and KI–; paraphyses are visible in young perithecia but delinquent in mature ones. The asci are saccate, 8-spored, and 20-30  $\times$  8-13  $\mu\text{m}$  in size; their wall is strongly thickened towards the apex and features an ocular chamber.

While some of these features clearly agree with *Stigmatidium* (hamathecium, asci, ascospores) and suggest a relationship with *S. porinae*, others are reminiscent of *Microtheliopsis*, such as the cover of the perithecia with a layer of dark pigmented algal cells, their ellipsoid shape when seen from above (elongate in radiate direction), and their concentric arrangement. In fact, morphologically the species is extremely similar to *Microtheliopsis uniseptata*.



Since species of *Stigmidium* are lichenicolous (Matzer 1996), the present case suggests a lichenicolous *Stigmidium* on a thallus of *Microtheliopsis*, as already indicated by Lücking *et al.* (2001). However, in the collections available, I have found no indication that the infected thalli are those of a *Microtheliopsis*, although the phycobiont is the same as in the latter. No fungal hyphae are apparent except for those of the *Stigmidium* developed in proximity to its perithecia. Not a single thallus carries structures that could be interpreted as young or depauperate perithecia of *Microtheliopsis*. It is known that lichenicolous fungi often suppress the production of ascomata of the host lichens; however, in the present case it seems that no host mycobiont is present at all, i.e. the infected alga is non-lichenized. In this case the *Stigmidium* would have to be considered an algal parasite. However, the infected alga does not seem to suffer at all: there are no visible necrotic parts, not even near the perithecia. In addition, the latter are always very regularly arranged in the algal patches. Considering these features and the formation on an "involucrellum" by the algal thallus, the biological relationship between the *Stigmidium* and the infected photobiont seems to be the same as in *Microtheliopsis*, and like the latter, *Stigmidium concentricum* should therefore be considered lichenized rather than lichenicolous.

Specimen examined: FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1193 (hb. Lücking).

***Tricharia* aff. *urceolata* (Müll. Arg.) R. Sant.**

Ill.: Fig. 3G-H (habit).

This specimen is somewhat intermediate between *Tricharia urceolata* and *T. longispora* Kalb & Vezda. The apothecia are darker, more regularly rounded, and more prominent than in the former, but not as high as in the latter; they also lack the pale margin typical of the latter. It probably deals with an undescribed species, but the material is too scanty to establish its variational amplitude.

Specimen examined: FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1581 (hb. Lücking).

***Trichothelium bipindense* F. Schill.**

Material of this species was previously identified as *Trichothelium annulatum* by Aptroot & Sipman (1993).

***Trichothelium confusum* Lücking sp.n.**

Sicut *Trichothelium miro* sed peritheciis maioribus et ascosporis 7-septatis minoribusque differt.

Type. FRENCH GUIANA. Sinnamary: Piste de St. Elie Field Station (ORSTOM), 95 km NW of Cayenne and 47 km NW of Kourou near Sinnamary, 5° 20' N, 53° 02' W, 50 m, tropical lowland rainforest along road, on leaves in understory, May 1995, Lücking 95-1405 (CAY, holotype). – Ill.: Fig. 2E-G (habit), 4C (ascospores).

Thallus foliicolous, epiphyllous, crustose, dispersed into rounded, soon confluent patches, 10-25 mm across and 10-15 µm thick, smooth, pale brownish grey. Phycobiont a species of *Phycopeltis*, cells angular-rounded and often bent, 7-13 × 3-6 µm, in irregular plates leaving small interspaces. Perithecia sessile,



hemispherical to subglobose, 0.2-0.3 mm diam. and 150-200  $\mu\text{m}$  high, brownish black, around the ostiole with 10-15 acute to bristle-shaped, straight to slightly curved, 0.3-0.5 mm long, whitish, basally blackish setae; the whole setal crown up to 1 mm diam. Excipulum prosoplectenchymatous, 5-10  $\mu\text{m}$  thick, basally dark brown but in upper parts pale, confluent with involucrellum; involucrellum 20-30  $\mu\text{m}$  thick, brownish black, K-. Paraphyses unbranched, 0.7-1  $\mu\text{m}$  thick. Asci obclavate to narrowly fusiform, 70-90  $\times$  15-20  $\mu\text{m}$ . Ascospores 8 per ascus, oblong to narrowly fusiform, 7(-9)-septate, with very slight constrictions at septa, 35-45  $\times$  4-5  $\mu\text{m}$ , 8-10 times as long as broad, colourless. Pycnidia not observed.

If not carefully examined, this new species is easily confused with *Trichothelium epiphyllum*, because of the rather large perithecia with horizontal setal crown and the 7-septate ascospores. Several characters, however, set it apart from the latter: the irregular phycobiont, the numerous, acute to bristle-shaped setae, and the slight constrictions at the ascospore septa. These features, on the other hand, indicate a close relationship with *T. mirum* Lücking. Indeed, *T. confusum* looks like a large morph of the latter species, but apart from the smaller perithecia, *T. mirum* also differs in its much longer, 15-septate ascospores, which feature the same slightly constricted septa as *T. confusum*. Both species seem to belong in the *T. pallidesetum* group as defined by Lücking (1998b), where they find a counterpart in the couple *T. pallidesetum* Lücking and *T. longisporum* Lücking: while the former has larger perithecia and smaller ascospores, the opposite is found in the latter.

*Trichothelium confusum* is also related to *T. alboatrum* Vain., *T. africanum* Lücking, and *T. argenteum* Lücking & Ferraro. *T. alboatrum* has smaller perithecia and ascospores, and its setae are entirely whitish and bristle-shaped, while *T. africanum* has mostly dark and acute setae. In *T. argenteum*, the young perithecia feature a disc of completely confluent setae, while the setal crown of mature perithecia is very well-developed, regular and dense (up to 30 setae).

### *Trichothelium pallidum* Lücking sp.n.

Sicut *Trichothelium sipmanii* sed peritheciis pallidis et ascosporis 9-13-septatis maioribus differt.

Type. FRENCH GUIANA. Approuague-Kaw: Nouragues Field Station (CNRS), 110 km SSW of Cayenne, 4° 01' N, 52° 33' W, 50-250 m, tropical lowland rainforest in hilly region, on leaves in understory, May 1995, Lücking 95-1617 (CAY, holotype). - Ill.: Fig. 2H (habit), 4D (ascospores).

Thallus foliicolous, epiphyllous, crustose, dispersed into rounded, confluent patches, 5-10 mm across and 10-15  $\mu\text{m}$  thick, smooth, pale brownish grey. Phycobiont a species of *Phycopeltis*, cells rectangular, 10-15  $\times$  3-5  $\mu\text{m}$ , in distinctly radiate plates. Perithecia sessile, subglobose, 0.15-0.2 mm diam. and 120-180  $\mu\text{m}$  high, yellowish to reddish white, around the ostiole with 6-10 irregular, acute to bristle-shaped, obliquely arranged, 0.1-0.2 mm long, whitish setae; the whole setal crown up to 0.4 mm diam. Excipulum prosoplectenchymatous, 5-10  $\mu\text{m}$  thick, colourless, confluent with involucrellum; involucrellum indistinctly paraplectenchymatous, 20-25  $\mu\text{m}$  thick, pale yellowish, K+ orange yellow. Paraphyses unbranched, 0.7-1  $\mu\text{m}$  thick. Asci obclavate to narrowly fusiform, 80-120  $\times$  10-12  $\mu\text{m}$ . Ascospores 8 per ascus, bacillar, 9-13-septate, without constrictions at septa, 45-60  $\times$  3-4  $\mu\text{m}$ , 13-16 times as long as broad, colourless. Pycnidia not observed.

This enigmatic new species provides another stepping stone towards understanding (or not) the systematic relationships within *Porinaceae*, since it



combines features of *Trichothelium* with a pale, K+ orange perithecial wall. Most species of that genus have a black perithecial wall similar to that found in black-fruited *Porina* species, and this feature has been used to subdivide and recombine *Porina* and *Trichothelium* into presumedly more natural entities (Hafellner & Kalb 1995; Harris 1995). Species previously placed in *Trichothelium* but with a brownish red, K+ reddish perithecial wall have been redispersed into *Porina*, where they apparently find close relatives in the *P. rufula* group (Lücking, 1998b). In these taxa, the perithecia setae are usually softer than in typical *Trichothelium* and clearly represent an analogous structure. However, the placement of a species with reddish perithecia but very long, stiff setae, *T. robinsonii* Vain. from the eastern Paleotropics (= *T. croceum* Sérus.?), provided difficulties. Also, a species with entirely pale, K- perithecial wall, *T. album* Lücking, was described from Costa Rica.

The new species, *Trichothelium pallidum*, is apparently very closely related to *T. sipmanii* (especially f. *multiseptatum*). It has exactly the same thallus and perithecial morphology, including the short, irregular, oblique setae, and even the same type of very elongate, bacillar ascospores. The only difference is found in the perithecial wall pigmentation: blackish brown and K- in *T. sipmanii* vs. pale yellowish and K+ orange yellow in *T. pallidum*. Thus, these two species combine features which, based on certain taxonomic concepts, would place them in different genera. A very similar case was described from *Porina*, with the closely related couple *P. pseudoapplanata* and *P. mirabilis* (Lücking & Vezda 1998): while the latter has perithecia immersed in crystalline thallus verrucae, and hence belongs in the *P. epiphylla* group or *Porina* s.str. according to Harris (1995), the former lacks crystals and would have to be placed in the *P. rufula* group or *Segestria* sensu Harris (1995). While those groups in their majority conform natural entities, these examples demonstrate that individual relationships are much more complex than indicated by the presence or absence of certain perithecial pigments or other anatomical details.

## FURTHER SPECIES

The following list compiles all further species identified in the collected material. Nomenclature follows Lücking (2006). Collection sites are abbreviated as Nouragues, Saül, Paracou, and Piste de St. Elie (see Fig. 1 for complete data). All collections were made by the author. CAY = Institut de Recherche pour le Developpement (IRD), Cayenne, French Guiana; F = The Field Museum (Field Museum of Natural History), Chicago, U.S.A. Asterisks indicate new records for French Guiana.

- Actinoplaca strigulacea* Müll. Arg.** Nouragues: understory, 95-1110 (hb. Lücking), 95-1111 (CAY), 95-1586 (hb. Lücking). Paracou: understory, 95-1320 (F). Saül: understory, 95-1458 (CAY); forest margin, 95-1555 (F, hb. Lücking).
- \* ***Aderkomyces albostrigosus* (R. Sant.) Lücking, Sérus. & Vezda.** Piste de St. Elie: understory, 95-1349 (hb. Lücking).
- \* ***Aderkomyces heterellus* (Stirt.) Lücking, Sérus. & Vezda.** Nouragues: understory, 95-1181 (hb. Lücking), 95-1582 (F). Paracou: understory, 95-1331 (hb. Lücking). Piste de St. Elie: understory, 95-1350 (CAY, hb. Lücking). Saül: understory, 95-1453 (CAY).



- \* *Aderkomyces papilliferus* (Lücking) Lücking, Sérus. & Vezda. Piste de St. Elie: understory, 95-1345 (CAY).
- \* *Aderkomyces planicarpus* (Lücking) Lücking, Sérus. & Vezda. Nouragues: understory, 95-1120 (F). Paracou: understory, 95-1330 (hb. Lücking). Saül: understory, 95-1449 (CAY).
- \* *Amazonomyces sprucei* (R. Sant.) Lücking, Sérus. & Thor. Nouragues: understory, 95-1130 (CAY), 95-1133 (hb. Lücking), 95-1607 (F). Paracou: understory, 95-1268 (F), 95-1269 (CAY, hb. Lücking). Piste de St. Elie: understory, 95-1436 (CAY).
- \* *Anisomeridium foliicola* R. Sant. & Tibell. Nouragues: understory, 95-1599 (F). Paracou: understory, 95-1312 (CAY). Piste de St. Elie: understory, 95-1411 (F). Saül: understory, 95-1482 (CAY).
- \* *Anisomeridium musaesporoides* Etayo & Lücking. Nouragues: understory, 95-1208 (hb. Lücking). Paracou: understory, 95-1301 (CAY). Piste de St. Elie: understory, 95-1409 (CAY). Saül: understory, 95-1480 (F).
- \* *Anisomeridium prolongatum* Lücking. Piste de St. Elie: understory, 95-1410 (hb. Lücking).
- \* *Arthonia accolens* Stirt. Paracou: understory, 95-1272 (CAY). Piste de St. Elie: understory, 95-1426 (hb. Lücking), 95-1427 (F). Saül: understory, 95-1532 (CAY).
- \* *Arthonia aciniformis* Stirt. Nouragues: understory, 95-1166 (hb. Lücking). Saül: understory, 95-1523 (CAY).
- Arthonia cyanea* Müll. Arg. Nouragues: understory, 95-1164 (F, hb. Lücking). Paracou: understory, 95-1273 (CAY). Piste de St. Elie: understory, 95-1426 (hb. Lücking), 95-1427 (F), 95-1429 (CAY). Saül: understory, 95-1532 (CAY).
- \* *Arthonia flavoverrucosa* U. Becker & Lücking. Saül: forest margin, 95-1543 (CAY).
- \* *Arthonia grubei* Lücking. Nouragues: understory, 95-1167 (hb. Lücking).
- \* *Arthonia lecythidicola* (Bat. & H. Maia) Lücking & Sérus. Nouragues: understory, 95-1171 (F), 95-1172 (to be distributed in LICH. FOL. EXS.). Paracou: understory, 95-1263 (CAY). Saül: forest margin, 95-1552 (to be distributed in LICH. FOL. EXS.)
- \* *Arthonia leptosperma* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1169 (CAY).
- \* *Arthonia lobulocarpa* U. Becker & Lücking. Paracou: understory, 95-1261 (hb. Lücking).
- \* *Arthonia mira* R. Sant. Nouragues: understory, 95-1159 (CAY).
- Arthonia palmulacea* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1170 (CAY, hb. Lücking). Paracou: understory, 95-1274 (CAY). Piste de St. Elie: understory, 95-1440 (F). Saül: understory, s.n. (to be distributed in LICH. FOL. EXS.); forest margin, 95-1538 (CAY).
- \* *Arthonia trilocularis* Müll. Arg. Nouragues: understory, 95-1165 (hb. Lücking). Paracou: understory, 95-1267 (CAY). Piste de St. Elie: understory, 95-1425 (hb. Lücking).
- \* *Arthotheliopsis tricharioides* (Kalb & Vezda) Lücking, Sérus. & Vezda. Nouragues: understory, 95-1579 (hb. Lücking). Piste de St. Elie: understory, 95-1379 (hb. Lücking).
- Aspidothelium fugiens* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1598 (CAY). Saül: forest margin, 95-1628 (F).
- \* *Aspidothelium papillicarpum* Lücking. Paracou: understory, 95-1303 (F). Saül: understory, 95-1483 (CAY).



- \* *Aspidothelium scutellarpum* **Lücking**. Nouragues: understory, 95-1210 (CAY). Paracou: understory, 95-1302 (hb. Lücking).
- \* *Asterothyrium pittieri* **Müll. Arg.** Saül: forest margin, 95-1557 (CAY).
- \* *Asterothyrium rondoniense* **Bat. & H. Maia ex Henssen & Lücking**. Paracou: understory, 95-1326 (F, hb. Lücking). Saül: forest margin, 95-1562 (CAY, hb. Lücking).
- \* *Asterothyrium rotuliforme* (**Müll. Arg.**) **Sérus**. Saül: forest margin, 95-1557 (CAY, filed under *A. pittieri*).
- \* *Asterothyrium tetrasporum* **Lücking**. Saül: forest margin, 95-1561 (CAY).
- Aulaxina minuta* **R. Sant.** Nouragues: understory, 95-1115 (CAY). Paracou: understory, 95-1318 (F). Piste de St. Elie: understory, 95-1357 (CAY). Saül: forest margin, 95-1559 (hb. Lücking).
- Aulaxina quadrangula* (**Stirt.**) **R. Sant.** Nouragues: understory, 95-1116 (CAY). Piste de St. Elie: understory, 95-1356 (CAY). Saül: forest margin, 95-1560 (F).
- Brasilicia brasiliensis* (**Müll. Arg.**) **Lücking, Kalb & Sérus**. Nouragues: understory, 95-1013 (hb. Lücking), 95-1017 (CAY), 95-1018 (ULM), 95-1019 (F), 95-1020 (CAY), 95-1022 (ULM), 95-1024 (F). Piste de St. Elie: understory, 95-1366 (CAY). Saül: understory, 95-1479 (hb. Lücking).
- \* *Bacidina hypophylla* **Lücking & Kalb**. Nouragues: understory, 95-1009 (hb. Lücking).
- \* *Bacidina neotropica* **Lücking**. Nouragues: understory, 95-1010 (F), 95-1011 (hb. Lücking), 95-1012 (CAY). Saül: understory, 95-1475 (ULM).
- \* *Bacidina pseudohyphosphorifera* (**Lücking & Sérus**) **Lücking**. Nouragues: understory, 95-1008 (CAY, hb. Lücking), 95-1563 (F). Piste de St. Elie: understory, 95-1359 (CAY).
- Badimia dimidiata* (**C. Bab. ex Leight.**) **Ve zda**. Nouragues: understory, 95-1028 (CAY), 95-1030 (F), 95-1031 (hb. Lücking), 95-1032 (ULM), 95-1035 (CAY), 95-1037 (CAY, hb. Lücking), 95-1038 (CAY), 95-1039 (F, hb. Lücking), 95-1040 (ULM, hb. Lücking). Piste de St. Elie: understory, 95-1358 (hb. Lücking). Paracou: understory, 95-1234 (CAY, hb. Lücking). Saül: understory, 95-1538 (ULM).
- \* *Badimia leioplacella* (**Müll. Arg.**) **Lücking**. Nouragues: understory, 95-1029 (hb. Lücking). Piste de St. Elie: understory, 95-1358 (hb. Lücking, filed under *B. dimidiata*).
- \* *Badimia pallidula* (**Kremp.**) **Ve zda**. Paracou: understory, 95-1233 (CAY).
- \* *Bapalmuia lineata* **Lücking & Kalb**. Nouragues: understory, 95-1016 (CAY). Saül: understory, 95-1478 (hb. Lücking).
- \* *Bapalmuia nigrescens* (**Müll. Arg.**) **Cáceres & Lücking**. Nouragues: understory, 95-1046 (hb. Lücking), 95-1106 (CAY). Paracou: understory, 95-1247 (hb. Lücking), 95-1248 (CAY). Piste de St. Elie: understory, 95-1360 (F). Saül: understory, 95-1476 (ULM).
- \* *Bapalmuia palmularis* (**Müll. Arg.**) **Sérus**. Nouragues: understory, 95-1025 (hb. Lücking), 95-1026 (CAY), 95-1027 (F); forest margin, 95-1614 (hb. Lücking). Paracou: understory, 95-1235 (CAY). Piste de St. Elie: understory, 95-1367 (hb. Lücking).
- Byssolecania deplanata* (**Müll. Arg.**) **R. Sant.** Nouragues: understory, 95-1056 (CAY), 95-1058 (F), 95-1060 (ULM). Paracou: understory, 95-1256 (hb. Lücking). Piste de St. Elie: understory, 95-1380 (hb. Lücking). Saül: understory, 95-1499 (CAY).
- \* *Byssolecania fumosonigricans* (**Müll. Arg.**) **R. Sant.** Nouragues: understory, 95-1059 (hb. Lücking); forest margin, 95-1585 (hb. Lücking). Paracou:



- understory, 95-1257 (CAY). Piste de St. Elie: understory, 95-1381 (hb. Lücking). Säul: forest margin, 95-1640 (hb. Lücking).
- \* *Byssolecania hymenocarpa* (Vain.) Kalb, Vezda & Lücking. Nouragues: understory, 95-1057 (hb. Lücking). Paracou: understory, 95-1253 (CAY).
- \* *Byssolecania variabilis* Vezda, Kalb & Lücking. Nouragues: forest margin, 95-1584 (CAY). Piste de St. Elie: understory, 95-1382 (hb. Lücking). Säul: understory, 95-1505 (hb. Lücking), 95-1506 (F), 95-1509 (ULM).
- \* *Byssoloma chlorinum* (Vain.) Zahlbr. Nouragues: understory, 95-1566 (CAY). Paracou: understory, 95-1241 (hb. Lücking). Piste de St. Elie: understory, 95-1363 (hb. Lücking).
- \* *Byssoloma fadenii* Vezda Piste de St. Elie: understory, 95-1377 (CAY).
- \* *Byssoloma guttiferæ* (Bat. & Peres) R. Lücking & Sérus. Nouragues: understory, 95-1050 (CAY), 95-1100 (CAY). Paracou: understory, 95-1249 (F). Piste de St. Elie: understory, 95-1477 (F).
- \* *Byssoloma humboldtianum* Lücking & Kalb. Nouragues: understory, 95-1047 (F, hb. Lücking). Paracou: understory, 95-1254 (CAY).
- \* *Byssoloma leucoblepharum* (Nyl.) Vain. Nouragues: understory, 95-1052 (CAY). Paracou: understory, 95-1240 (CAY). Piste de St. Elie: understory, 95-1362 (hb. Lücking). Säul: understory, 95-1469 (F); forest margin, 95-1643 (hb. Lücking).
- \* *Byssoloma minutissimum* Kalb & Vezda. Nouragues: understory, 95-1104 (CAY). Paracou: understory, 95-1255 (F). Piste de St. Elie: understory, 95-1372 (F). Säul: understory, 95-1468 (CAY).
- Byssoloma subdiscordans* (Nyl.) P. James. Nouragues: understory, 95-1567 (hb. Lücking). Paracou: understory, 95-1239 (CAY). Piste de St. Elie: understory, 95-1361 (F).
- Byssoloma tricholomum* (Mont.) Zahlbr. Paracou: understory, 95-1237 (CAY). Piste de St. Elie: understory, 95-1388 (CAY). Säul: understory, 95-1471 (F).
- \* *Byssoloma vanderystii* Sérus. Piste de St. Elie: understory, 95-1383 (CAY). Säul: understory, 95-1573 (F).
- \* *Byssoloma vezdanum* Sérus. Nouragues: understory, 95-1053 (F, hb. Lücking). Paracou: understory, 95-1243 (CAY, hb. Lücking).
- \* *Eugeniella leucocheila* (Tuck.) Lücking, Sérus. & Kalb. Nouragues: understory, 95-1571 (hb. Lücking). Säul: understory, 95-1473 (CAY).
- \* *Calenia bullatinoides* Lücking. Säul: forest margin, 95-1549 (hb. Lücking).
- \* *Calenia graphidea* Vain. Nouragues: understory, 95-1112 (hb. Lücking). Piste de St. Elie: understory, 95-1353 (F). Säul: understory, 95-1454 (CAY).
- \* *Calenia phyllogena* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1119 (CAY). Piste de St. Elie: understory, 95-1354 (F).
- \* *Calenia solorinoides* Lücking. Paracou: understory, 95-1325 (CAY).
- Caleniopsis conspersa* (Stirt.) Lücking, Sérus. & Vezda. Nouragues: understory, 95-1109 (CAY, hb. Lücking). Paracou: understory, 95-1332 (CAY), 95-1333 (F). Piste de St. Elie: understory, 95-1346 (F). Säul: understory, 95-1455 (F).
- \* *Caleniopsis laevigata* (Müll. Arg.) Vezda & Poelt. Paracou: understory, 95-1315 (F). Piste de St. Elie: understory, 95-1344 (CAY).
- \* *Calopadia foliicola* (Fée) Vezda. Nouragues: understory, 95-1569 (CAY). Säul: forest margin, 95-1638 (F).
- \* *Calopadia fusca* (Müll. Arg.) Vezda. Nouragues: understory, 95-1570 (CAY).
- \* *Calopadia phyllogena* (Müll. Arg.) Vezda. Piste de St. Elie: understory, 95-1370 (CAY). Säul: forest margin, 95-1637 (hb. Lücking).
- \* *Calopadia puiggarii* (Müll. Arg.) Vezda. Paracou: understory, 95-1245 (CAY). Säul: forest margin, 95-1641 (F).



- \* *Calopadia subcoerulescens* (Zahlbr.) Vezda. Nouragues: understory, 95-1572 (CAY).
- \* *Caprettia amazonensis* Bat. & H. Maia. Piste de St. Elie: understory, 95-1413 (hb. Lücking).
- \* *Caprettia neotropica* Lücking & Sérus. Piste de St. Elie: understory, 95-1412 (CAY).
- \* *Chroodiscus australiensis* Vezda & Lumbsch. Nouragues: understory, 95-1118 (hb. Lücking). Paracou: understory, 95-1316 (CAY). Saül: understory, 95-1462 (hb. Lücking).
- Chroodiscus coccineus* (Leight.) Müll. Arg. Nouragues: understory, 95-1123 (CAY), 95-1577 (F). Paracou: understory, 95-1317 (CAY). Piste de St. Elie: understory, 95-1337 (CAY). Saül: understory, 95-1456 (CAY), 95-1460 (F), 95-1546 (F).
- \* *Chroodiscus neotropicus* Kalb & Vezda. Nouragues: understory, 95-1126 (CAY).
- Coccocarpia domingensis* Vain. Saül: forest margin, 95-1621 (CAY, hb. Lücking).
- Coccocarpia epiphylla* (Fée) Kremp. Piste de St. Elie: understory, 95-1339 (CAY).
- Coccocarpia pellita* (Ach.) Müll. Arg. Piste de St. Elie: understory, 95-1336 (CAY). Saül: understory, 95-1457 (hb. Lücking).
- \* *Coenogonium ciliatum* Kalb & Lücking. Nouragues: understory, 95-1108 (F, hb. Lücking). Paracou: understory, 95-1335 (CAY). Saül: understory, 95-1461 (CAY).
- \* *Coenogonium fallaciosum* (Müll. Arg.) Kalb & Lücking. Nouragues: understory, 95-1128 (CAY).
- \* *Coenogonium geralense* (P. Henn) Lücking. Nouragues: understory, 95-1576 (CAY).
- Coenogonium hypophyllum* (Vezda) Kalb & Lücking. Nouragues: understory, 95-1127 (CAY).
- \* *Coenogonium interplexum* Nyl. Nouragues: understory, 95-1125 (CAY). Saül: forest margin, 95-1631 (hb. Lücking).
- Coenogonium interpositum* Nyl. Paracou: understory, 95-1334 (CAY, hb. Lücking). Saül: understory, 95-1466 (hb. Lücking).
- Coenogonium linkii* Ehrenb. Piste de St. Elie: understory, 95-1340 (CAY). Saül: understory, 95-1464 (hb. Lücking).
- \* *Coenogonium subluteum* (Rehm) Kalb & Lücking. Nouragues: understory, 95-1586 (CAY).
- \* *Cryptothecia filicina* (Ellis & Everh.) Lücking, Thor, Aptroot & Kalb. Paracou: understory, 95-1264 (CAY). Piste de St. Elie: understory, 95-1442 (F, hb. Lücking). Saül: forest margin, 95-1533 (hb. Lücking).
- \* *Cryptothecia effusa* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1604 (CAY).
- \* *Cryptothecia rubrocincta* (Ehrenb.) Thor. Saül: forest margin, 95-1536 (hb. Lücking).
- \* *Echinoplaca bispora* Kalb & Vezda. Saül: forest margin, 95-1544 (CAY).
- Echinoplaca epiphylla* Fée. Paracou: understory, 95-1319 (F). Saül: forest margin, 95-1555 (CAY).
- \* *Echinoplaca furcata* subsp. *neotropica* Lücking. Nouragues: forest margin, 95-1587 (F, hb. Lücking). Paracou: understory, 95-1324 (CAY). Piste de St. Elie: understory, 95-1351 (hb. Lücking).
- \* *Echinoplaca leucotrichoides* (Vain.) R. Sant. Paracou: understory, 95-1323 (F). Saül: forest margin, 95-1550 (CAY).



- \* *Echinoplaca marginata* Lücking. Nouragues: understory, 95-1583 (F). Saül: forest margin, 95-1556 (CAY).
- \* *Echinoplaca pellicula* (Müll. Arg.) R. Sant. Piste de St. Elie: understory, 95-1343 (CAY). Saül: understory, 95-1451 (F).
- \* *Echinoplaca verrucifera* Lücking. Piste de St. Elie: understory, 95-1352 (CAY). Saül: forest margin, 95-1553 (F, hb. Lücking).
- \* *Eremothecella calamicola* Syd. Nouragues: understory, 95-1168 (CAY). Paracou: understory, 95-1277 (CAY). Piste de St. Elie: understory, 95-1430 (F).
- \* *Fellhanera badimoides* Lücking, Lumbsch & Elix. Nouragues: understory, 95-1180 (CAY).
- \* *Fellhanera bouteillei* (Desm.) Vezda. Saül: forest margin, 95-1639 (CAY).
- \* *Fellhanera fuscatula* (Müll. Arg.) Vezda. Saül: understory, 95-1530 (CAY), 95-1531 (hb. Lücking).
- \* *Fellhanera lambinonii* (Sérus.) Lücking & Serus. Nouragues: understory, 95-1575 (CAY, hb. Lücking).
- \* *Fellhanera naevia* (Vain.) Lücking & Cáceres. Paracou: understory, 95-1258 (CAY).
- \* *Fellhanera rhapidophylli* (Rehm) Vezda. Piste de St. Elie: understory, 95-1375 (hb. Lücking).
- \* *Fellhanera rubida* (Müll. Arg.) Lücking. Piste de St. Elie: understory, 95-1374 (CAY).
- \* *Fellhanera santessonii* Barillas & Lücking. Nouragues: understory, 95-1054 (F). Piste de St. Elie: understory, 95-1376 (hb. Lücking). Saül: understory, 95-1470 (CAY).
- \* *Fellhanera stanhopeae* (Müll. Arg.) Lücking. Saül: forest margin, 95-1642 (CAY).
- \* *Fellhanera verrucifera* Lücking. Nouragues: understory, 95-1044 (F). Paracou: understory, 95-1238 (CAY). Piste de St. Elie: understory, 95-1371 (hb. Lücking).
- Flavobathelium epiphyllum* Lücking, Aptroot & Thor. Nouragues: understory, 95-1209 (CAY). Saül: understory, 95-1491 (F); forest margin, 95-1627 (hb. Lücking).
- Gyalectidium filicinum* Müll. Arg. Nouragues: understory, 95-1117 (CAY). Paracou: understory, 95-1327 (F). Saül: understory, 95-1459 (CAY).
- \* *Gyalectidium imperfectum* Vezda. Nouragues: understory, 95-1578 (CAY). Piste de St. Elie: understory, 95-1355 (F). Saül: understory, 95-1450 (F); forest margin, 95-1629 (CAY).
- Lasioloma arachnoideum* (Kremp.) R. Sant. Nouragues: understory, 95-1001 (CAY), 95-1565 (F, hb. Lücking). Paracou: understory, 95-1246 (CAY). Piste de St. Elie: understory, 95-1365 (F, hb. Lücking). Saül: understory, 95-1467 (F); forest margin, 95-1645 (hb. Lücking).
- Loflammia epiphylia* (Fée) Lücking & Vezda. Paracou: understory, 95-1236 (CAY). Piste de St. Elie: understory, 95-1364 (F).
- \* *Lyromma nectandrae* Bat. & H. Maia. Nouragues: understory, 95-1612 (hb. Lücking). Paracou: understory, 95-1309 (CAY). Saül: forest margin, 95-1540 (hb. Lücking).
- \* *Malcolmiella amazonica* (Redinger) Kalb & Lücking. Nouragues: understory, 95-1042 (CAY).
- \* *Malcolmiella psychotrioides* Kalb & Lücking. Nouragues: understory, 95-1043 (hb. Lücking).
- \* *Mazosia bambusae* (Vain.) R. Sant. Nouragues: understory, 95-1139 (CAY). Piste de St. Elie: understory, 95-1428 (hb. Lücking), 95-1431 (CAY).



- Mazosia dispersa* (Hedr.) R. Sant. Nouragues: understory, 95-1611 (F). Paracou: understory, 95-1279 (hb. Lücking). Piste de St. Elie: understory, 95-1434 (CAY). Saül: understory, 95-1525 (F); forest margin, 95-1541 (CAY).
- \* *Mazosia longispora* Lücking & Matzer. Nouragues: understory, 95-1160 (CAY). Piste de St. Elie: understory, 95-1432 (CAY).
- Mazosia melanophthalma* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1156 (CAY). Paracou: understory, 95-1280 (hb. Lücking, filed under *M. praemorsa*). Piste de St. Elie: understory, 95-1433 (CAY). Saül: understory, 95-1527 (F); forest margin, 95-1539 (hb. Lücking).
- Mazosia paupercula* (Müll. Arg.) R. Sant. Nouragues: understory, 95-1173 (hb. Lücking).
- Mazosia phyllosema* (Nyl.) Zahlbr. Nouragues: understory, 95-1608 (CAY).
- \* *Mazosia pilosa* Kalb & Vezda. Nouragues: understory, 95-1153 (CAY). Paracou: understory, 95-1278 (CAY). Piste de St. Elie: understory, 95-1443 (F, hb. Lücking).
- Mazosia praemorsa* (Stirt.) R. Sant. Nouragues: understory, 95-1148 (CAY), 95-1149 (CAY), 95-1609 (F). Paracou: understory, 95-1279 (CAY). Piste de St. Elie: understory, 95-1431 (CAY), 95-1444 (CAY, hb. Lücking). Saül: understory, 95-1520 (F).
- Mazosia rotula* (Mont.) Massal. Nouragues: understory, 95-1610 (F). Paracou: understory, 95-1275 (CAY). Piste de St. Elie: understory, 95-1435 (CAY). Saül: understory, 95-1526 (hb. Lücking); forest margin, 95-1537 (hb. Lücking).
- Mazosia rubropunctata* R. Sant. Paracou: understory, 95-1260 (CAY).
- \* *Mazosia tenuissima* Lücking & Matzer. Nouragues: understory, 95-1157 (CAY, hb. Lücking), 95-1158 (F). Paracou: understory, 95-1276 (hb. Lücking). Saül: understory, 95-1521 (CAY).
- Mazosia tumidula* (Stirt.) Müll. Arg. Nouragues: understory, 95-1143 (F), 95-1145 (CAY). Paracou: understory, 95-1270 (hb. Lücking). Saül: understory, 95-1524 (CAY).
- \* *Microtheliopsis uleana* Müll. Arg. Nouragues: understory, 95-1610 (F). Paracou: understory, 95-1275 (CAY). Piste de St. Elie: understory, 95-1435 (CAY). Saül: understory, 95-1526 (hb. Lücking); forest margin, 95-1537 (hb. Lücking).
- \* *Microtheliopsis winkleri* Lücking. Nouragues: understory, 95-1220 (CAY, hb. Lücking), 95-1600 (F). Piste de St. Elie: understory, 95-1408 (CAY). Saül: understory, 95-1487 (hb. Lücking).
- Musaespora kalbii* Lücking & Sérus. Nouragues: understory, 95-1207 (CAY). Paracou: understory, 95-1300 (hb. Lücking). Piste de St. Elie: understory, 95-1403 (hb. Lücking).
- Opegrapha filicina* Mont. Nouragues: understory, 95-1137 (CAY). Paracou: understory, 95-1265 (CAY). Saül: understory, 95-1535 (F).
- \* *Phyllobathelium anomalum* Lücking. Nouragues: understory, 95-1597 (F). Paracou: understory, 95-1259 (CAY). Piste de St. Elie: understory, 95-1401 (hb. Lücking).
- \* *Phyllobathelium firmum* (Stirt.) Vezda. Saül: understory, 95-1484 (CAY).
- \* *Phyllobathelium leguminosae* (Cavalc. & A. A. Silva) Lücking & Sérus. Nouragues: understory, 95-1214 (CAY), 95-1596 (F). Saül: forest margin, 95-1624 (hb. Lücking).
- \* *Phyllobathelium thaxteri* (Vain.) Zahlbr. Nouragues: understory, 95-1216 (CAY, hb. Lücking). Paracou: understory, 95-1306 (hb. Lücking). Piste de St. Elie: understory, 95-1402 (hb. Lücking). Saül: understory, 95-1481 (F).
- \* *Phylloblastia amazonica* Kalb & Vezda. Nouragues: understory, 95-1211 (CAY).



- \* *Porina americana* Fée. Nouragues: understory, 95-1196 (hb. Lücking).  
*Porina andreana* Lücking & Vezda. Piste de St. Elie: understory, 95-1391 (hb. Lücking).
- \* *Porina atriceps* (Vain.) Vain. Nouragues: understory, 95-1187 (CAY). Paracou: understory, 95-1287 (F).
- \* *Porina distans* Vezda & Vivant. Nouragues: understory, 95-1182 (CAY).  
*Porina epiphylla* (Fée) Fée. Nouragues: understory, 95-1186 (CAY). Paracou: understory, 95-1289 (F). Piste de St. Elie: understory, 95-1387 (CAY). Saül: understory, 95-1508 (F).
- Porina fulvella* Müll. Arg. Paracou: understory, 95-1291 (CAY).  
*Porina fusca* Lücking. Nouragues: understory, 95-1192 (CAY, hb. Lücking). Paracou: understory, 95-1292 (F). Saül: understory, 95-1501 (hb. Lücking).
- Porina guianensis* Lücking & Vezda. Nouragues: understory, 95-1194 (hb. Lücking), 95-1202 (F; to be distributed in LICH. FOL. EXS.). Paracou: understory, 95-1288 (CAY).
- Porina karnatakensis* Makhija, Adawadkar & Patwardhan. Nouragues: understory, 95-1199 (CAY). Paracou: understory, 95-1286 (F). Saül: understory, 95-1498 (F).
- Porina leptospermoides* Müll. Arg. Piste de St. Elie: understory, 95-1399 (hb. Lücking, filed under *P. rufula*).
- Porina limbulata* (Kremp.) Vain. Nouragues: understory, 95-1190 (F). Piste de St. Elie: understory, 95-1400 (CAY). Saül: understory, 95-1495 (CAY).
- Porina lucida* R. Sant. Nouragues: understory, 95-1185 (CAY). Saül: understory, 95-1497 (hb. Lücking).
- Porina mirabilis* Lücking & Vezda. Nouragues: understory, 95-1184 (F). Paracou: understory, 95-1284 (CAY). Piste de St. Elie: understory, 95-1396 (hb. Lücking). Saül: understory, 95-1503 (hb. Lücking). — With *Phyllophiale alba* type isidia only: Nouragues: understory, 95-1188 (CAY). Paracou: understory, 95-1283 (CAY). Piste de St. Elie: understory, 95-1394 (F). Saül: forest margin, 95-1632 (F).
- Porina nitidula* Müll. Arg. Nouragues: understory, 95-1592 (CAY). Saül: forest margin, 95-1620 (hb. Lücking).
- Porina nucula* Ach. Nouragues: understory, 95-1197 (hb. Lücking). Paracou: understory, 95-1285 (hb. Lücking). Piste de St. Elie: understory, 95-1390 (hb. Lücking).
- \* *Porina pichinchensis* Lücking. Piste de St. Elie: understory, 95-1392 (hb. Lücking).
- Porina pseudoapplanata* Lücking & Cáceres. Nouragues: understory, 95-1191 (CAY). Piste de St. Elie: understory, 95-1398 (F). Saül: understory, 95-1496 (hb. Lücking); forest margin, 95-1625 (CAY). — With *Phyllophiale viridis* type isidia only: Nouragues: understory, 95-1595 (F). Saül: forest margin, 95-1630 (CAY).
- Porina radiata* Kalb, Lücking & Vezda. Nouragues: understory, 95-1200 (F, hb. Lücking). Paracou: understory, 95-1282 (F). Piste de St. Elie: understory, 95-1393 (hb. Lücking). Saül: understory, 95-1507 (CAY, hb. Lücking).
- Porina rubentior* (Stirt.) Müll. Arg. Nouragues: understory, 95-1201 (CAY, hb. Lücking). Paracou: understory, 95-1293 (CAY). Saül: understory, 95-1502 (F).
- \* *Porina rubrosphaera* R. Sant. Nouragues: understory, 95-1204 (hb. Lücking), 95-1591 (hb. Lücking).
- Porina rufula* (Kremp.) Vain. Nouragues: understory, 95-1189 (CAY). Paracou: understory, 95-1290 (CAY). Piste de St. Elie: understory, 95-1399 (hb. Lücking). Saül: understory, 95-1504 (F).



- Porina subepiphylla* Lücking & Vezda. Nouragues: understory, 95-1183 (F). Piste de St. Elie: understory, 95-1389 (hb. Lücking). Saül: understory, 95-1500 (CAY).
- Porina tetramera* (Malme) R. Sant. Saül: forest margin, 95-1620 (hb. Lücking).
- Porina tetracerae* (Afz. in Ach.) Müll. Arg. Nouragues: understory, 95-1203 (hb. Lücking).
- \* *Porina vezdae* Lücking Paracou: understory, 95-1294 (CAY).
- \* *Psoroglaena epiphylla* Lücking. Saül: understory, 95-1488 (hb. Lücking).
- \* *Sporopodium antonianum* Elix, Lumbsch & Lücking. Nouragues: understory, 95-1004 (CAY). Paracou: understory, 95-1251 (CAY). Piste de St. Elie: understory, 95-1368 (F).
- \* *Sporopodium citrinum* (Zahlbr.) Elix. Nouragues: understory, 95-1002 (hb. Lücking), 95-1003 (CAY).
- Sporopodium leprieurii* Mont. Nouragues: understory, 95-1006 (F), 95-1007 (CAY). Paracou: understory, 95-1250 (CAY). Saül: understory, 95-1472 (CAY); forest margin, 95-1636 (F).
- Sporopodium phyllocharis* (Mont.) Massal. Saül: forest margin, 95-1644 (CAY).
- \* *Sporopodium pilocarpoides* (Zahlbr.) Lücking & Kalb. Paracou: understory, 95-1252 (CAY). Piste de St. Elie: understory, 95-1373 (hb. Lücking).
- Strigula antillarum* (Fée) Müll. Arg. Nouragues: understory, 95-1589 (F). Paracou: understory, 95-1298 (hb. Lücking). Piste de St. Elie: understory, 95-1416 (CAY).
- Strigula concreta* (Fée) R. Sant. Piste de St. Elie: understory, 95-1420 (CAY). Saül: understory, 95-1511 (F).
- \* *Strigula janeirensis* (Müll. Arg.) Lücking. Nouragues: understory, 95-1215 (CAY). Piste de St. Elie: understory, 95-1424 (F, hb. Lücking).
- \* *Strigula macrocarpa* Vain. Paracou: understory, 95-1307 (CAY). Saül: understory, 95-1512 (hb. Lücking).
- \* *Strigula maculata* (Cooke & Masee) R. Sant. Nouragues: understory, 95-1223 (hb. Lücking), 95-1588 (CAY). Paracou: understory, 95-1313 (CAY, filed under *S. subtilissima*).
- \* *Strigula melanobapha* (Kremp.) R. Sant. Nouragues: understory, 95-1222 (CAY). Piste de St. Elie: understory, 95-1418 (hb. Lücking).
- \* *Strigula multipunctata* (G. Merr. ex R. Sant.) R. C. Harris. Nouragues: understory, 95-1221 (CAY, F, hb. Lücking).
- Strigula nemathora* Mont. Nouragues: understory, 95-1219 (CAY). Paracou: understory, 95-1304 (F). Piste de St. Elie: understory, 95-1415 (CAY).
- \* *Strigula nigrocarpa* Lücking. Nouragues: understory, 95-1205 (hb. Lücking).
- Strigula nitidula* Mont. Piste de St. Elie: understory, 95-1419 (CAY). Saül: forest margin, 95-1619 (CAY).
- \* *Strigula obducta* (Müll. Arg.) R. C. Harris. Nouragues: understory, 95-1212 (CAY). Paracou: understory, 95-1311 (F). Saül: understory, 95-1518 (CAY).
- \* *Strigula orbicularis* Fr. Saül: understory, 95-1513 (CAY); forest margin, 95-1623 (CAY).
- \* *Strigula phyllogena* (Müll. Arg.) R. C. Harris. Nouragues: understory, 95-1218 (CAY). Paracou: understory, 95-1296 (F). Piste de St. Elie: understory, 95-1422 (CAY). Saül: understory, 95-1515 (F).
- \* *Strigula platypoda* (Müll. Arg.) R. C. Harris. Nouragues: understory, 95-1213 (F). Paracou: understory, 95-1297 (CAY). Piste de St. Elie: understory, 95-1423 (CAY, hb. Lücking). Saül: understory, 95-1517 (F).
- \* *Strigula prasina* Müll. Arg. Nouragues: understory, 95-1206 (CAY).



- \* *Strigula schizospora* **R. Sant.** Nouragues: understory, 95-1231 (CAY). Piste de St. Elie: understory, 95-1414 (hb. Lücking). Saül: understory, 95-1514 (F); forest margin, 95-1622 (CAY).
- Strigula smaragdula* **Fr.** Nouragues: understory, 95-1232 (CAY). Paracou: understory, 95-1299 (CAY), 95-1310 (F). Saül: understory, 95-1516 (F).
- \* *Strigula subelegans* **Vain.** Nouragues: understory, 95-1230 (CAY). Saül: understory, 95-1512 (F).
- Strigula subtilissima* (**Fée**) **Müll. Arg.** Nouragues: understory, 95-1224 (CAY). Paracou: understory, 95-1313 (CAY). Piste de St. Elie: understory, 95-1417 (F).
- Tapellaria nana* (**Fée**) **R. Sant.** Nouragues: understory, 95-1564 (F). Paracou: understory, 95-1244 (CAY). Saül: forest margin, 95-646 (CAY, hb. Lücking).
- \* *Tapellaria nigrata* (**Müll. Arg.**) **R. Sant.** Saül: forest margin, 95-1634 (CAY).
- \* *Tapellariopsis octomera* **Lücking.** Piste de St. Elie: understory, 95-1369 (CAY).
- \* *Tricharia amazonum* **Vain.** Piste de St. Elie: understory, 95-1341 (CAY). Saül: forest margin, 95-1551 (hb. Lücking).
- \* *Tricharia farinosa* **R. Sant.** Nouragues: understory, 95-1114 (F). Piste de St. Elie: understory, 95-1348 (CAY).
- Tricharia hyalina* **Kalb & Vezda.** Paracou: understory, 95-1322 (CAY).
- \* *Tricharia longispora* **Kalb & Vezda.** Nouragues: understory, 95-1580 (F). Paracou: understory, 95-1329 (CAY). Piste de St. Elie: understory, 95-1353 (CAY).
- \* *Tricharia santessoniana* **Kalb & Vezda.** Saül: understory, 95-1465 (CAY).
- \* *Tricharia subhelminthospora* **Lücking.** Paracou: understory, 95-1328 (CAY).
- \* *Tricharia vainioi* **R. Sant.** Nouragues: understory, 95-1121 (F). Saül: understory, 95-1452 (CAY).
- Trichothelium annulatum* (**Karst.**) **R. Sant.** Nouragues: understory, 95-1227 (CAY). Piste de St. Elie: understory, 95-1407 (CAY). Saül: understory, 95-1490 (F).
- Trichothelium epiphyllum* **Müll. Arg.** Nouragues: understory, 95-1229 (F). Paracou: understory, 95-1305 (CAY).
- \* *Trichothelium juruense* (**P. Henn.**) **F. Schill.** Nouragues: understory, 95-1601 (hb. Lücking). Saül: understory, 95-1493 (CAY).
- Trichothelium minutum* (**Lücking**) **Lücking.** Paracou: understory, 95-1314 (CAY, hb. Lücking). Piste de St. Elie: understory, 95-1404 (hb. Lücking).
- \* *Trichothelium pallescens* (**Müll. Arg.**) **F. Schill.** Saül: understory, 95-1492 (CAY).
- \* *Trichothelium porinoides* **Vezda.** Paracou: understory, 95-1308 (CAY, hb. Lücking).
- \* *Trichothelium sipmanii* **Lücking.** Nouragues: understory, 95-1226 (CAY), 95-1602 (CAY, hb. Lücking). Paracou: understory, 95-1295 (F, hb. Lücking).
- \* *Trichothelium ulei* (**P. Henn.**) **Höhn.** Nouragues: understory, 95-1228 (CAY). Piste de St. Elie: understory, 95-1406 (CAY). Saül: understory, 95-1489 (F).

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and a complete key to the genera treated and their characteristics are also provided.

*Diceliana virens* / *Diceliana radicata* / *Peziza radicata* / Physciaeae / Andorra / Portugal / Spain

Resumen. Una revisión taxonómica de especies de género *Diceliana* de la Península Ibérica es presentada. Por morfología, anatomía histológica de los apotecios, el citoplasma, el contenido proteico y químico de diez especies del género, existencias en la Península Ibérica. *Diceliana virens* et *Diceliana radicata*, sunt discussae et de novis generis dicelianae huiusmodi sunt constructae. I species *Peziza radicata*, tres varietates de *Diceliana radicata* sunt describuntur. Des cartes de distribution, une illustration originale et deux tableaux de caractéristiques et de leurs races-climatiques sont également présentées.

*Diceliana virens* / *Diceliana radicata* / *Peziza radicata* / Physciaeae / Andorra / Spain / Portugal

Resumen. Se presenta una revisión taxonómica de las especies del género *Diceliana* de la Península Ibérica. Se describen y se ilustra por primera vez sobre la península ibérica una especie nueva de las subfamilias graminis, ceteroneae y distribución de los diez especies del género *Diceliana* en la península ibérica. *Diceliana virens* y *Diceliana radicata*. A efectos de comparación, se incluye un estudio de *Peziza radicata* y una especie estrechamente relacionada con *Diceliana radicata*. Además, se aporta cartografía e iconografía originales y se incluye un estudio de las especies ibéricas y sus razas climáticas.

*Diceliana virens* / *Diceliana radicata* / *Peziza radicata* / Physciaeae / Andorra / Spain / Portugal