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A RECONNAISSANCE OF THE GENUS PSEUDOBAEOSPORA IN EUROPE II

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In the second and last part of this paper the genus *Pseudobaeospora* is redefined, its taxonomic position is discussed, and the possibilities of a formal infrageneric classification are considered. Because of the recent discovery of another new species, viz. *P. mutabilis* Adamčík & Bas, emendations of the key published in the first part of this paper (Bas, 2002), are proposed. Descriptions and drawings of all European taxa known are presented. Extralimital species are discussed and compared with European species.

With the rapid increase in the number of species of the genus *Pseudobaeospora* in Europe from one or two 'classical' ones before 1995 to 14 to 16 species at present, also the morphological diversity of the genus has increased considerably. Therefore a new circumscription of the genus has become necessary, herewith emending the two most recent ones by Singer (1986) and Bas (1995).

Pseudobaeospora Singer, Lloydia 5 (1942) 129, emend. Bas

Selected literature. Horak (1964); Singer (1986); Bas (1995 & 2002).

Basidiocarps very small to small (pileus 1.5–30 mm in diameter; stipe 10–55(–70) × 0.1–3.0 mm), mycenoid to collybioid, often with more or less rooting base of stipe. Pileus pale to dark lilac, violaceous, purple, or grey to brown with such tinges, more rarely without these tinges, sometimes white to pale buff, in two extralimital species yellow, hemispherical, obtusely conical or paraboloid to plano-convex or plano-conical, with or without a small umbo or papilla, at first with outer margin inflexed, usually not or only very slightly hygrophanous with margin not or very slightly striate, but in the tiny basidiocarps of one species hygrophanous and translucently striate almost up to centre when moist, glabrous to minutely granular, minutely fibrillose or felted, more rarely subsquamulose, often somewhat micaceous or silvery because of aeriferous pileipellis. Lamellae emarginate to almost free or free, more rarely adnate, distant to fairly crowded, usually more or less concolorous with pileus, but in some coloured species very pale. Stipe cylindrical to filiform, sometimes tapering downwards, usually ± concolorous with pileus or somewhat darker or paler, usually sparsely to rather densely, minutely white pruinose to flocculose at apex, lower down glabrous to minutely fibrillose, rarely minutely flocculose, at base mostly with white to rarely yellow tomentum and rhizoids, without clear evidence of velar remnants. Context concolorous or paler. Smell (rarely recorded) indistinct, aromatic, weakly raphanoid or slightly farinaceous. Spore print white or whitish (only a few records; two very thin prints seen), but see remarks blow.

Spores very small to small (from 2.8 μm to rarely more than 6.5 μm long), globose to ellipsoid (average Q rarely up to 1.6), at first thin-walled and non-amyloid, but matur-

ing after liberation and becoming thick-walled, weakly to rather strongly dextrinoid, congophilous, cyanophilous, and rather frequently more or less metachromatic in cresyl blue (all spores on pileipellis and apex of stipe thick-walled, but in preparations of fragments of lamellae thin-walled spores usually dominant), with very distinct, abrupt hilar appendage, glabrous (in single species tested also with SEM), without germ pore, colourless but on pileus sometimes taking over colour of pileipellis. Basidia 4-spored, rarely 2-spored or 4- and 2-spored in the same basidiocarp, usually with clamp-connection, but in some species without, non-siderophilous. Scattered sclerified basidia usually present. Pleurocystidia always lacking. Cheilocystidia present in some species, broadly to narrowly clavate, lageniform, utriform, subcylindrical, or sometimes irregularly shaped, always thin-walled. Hymenophoral trama regular to somewhat irregular, with cells of hyphae in central part often inflated, sometimes ± dextrinoid. Subhymenium narrow, rather dense, from ramose to almost cellular. Pileipellis varying from a simple cutis in some species to an irregular hymeniderm in others, often two-layered and then the thin and inconspicuous to very distinct suprapellis a cutis made up of comparatively narrow hyphae, rarely with distinct pileocystidia, and the usually very prominent subpellis made up of radially to disorderly arranged chains of inflated cells. Pigments predominantly parietal but minute incrustations reported by some collectors (not observed in dried material, possibly disappearing in NH_4OH and KOH). Caulocystidia present at least at apex of stipe, clavate, subcylindrical to filiform, or irregularly shaped, thin-walled, scattered to very crowded. Context of stipe and pileus continuous. Trama of stipe regular, composed of cylindrical, thin- to slightly thick-walled, frequently septate hyphae. Clamp-connections usually present in several or all tissues, sometimes completely lacking, in one species restricted to basidia and subhymenium. In KOH 5% pileipellis fragments not or hardly changing colour or becoming violet, green, yellow or brownish with such tinges, rarely first red then yellow-green; other parts of basidiocarps may show similar colour changes (insufficiently investigated). In several species tissues more or less dextrinoid (insufficiently investigated).

Habitat & distribution — Terrestrial, probably non-mycorrhizal, on needle carpets of conifers, humus, forest litter, wooden debris, once on a fallen branch, among mosses and grasses (and then sometimes deeply hidden in the vegetation), but also sometimes on bare soil, most species seemingly preferring calcareous and/or nutrient-rich soils, but some occurring on peaty soil, from sea level to the subalpine (or even alpine?) zone, in temperate, subtropical and tropical regions; probably cosmopolitan, in literature reported from Europe, North and South America, and central and southern Asia; in Europe fruiting mainly from August–November, very rarely in July and December.

The most important emendation of the generic description concerns the greater variation in pileipellis structures. Two species even appeared to have a hymenidermoid pileipellis of erect inflated cells, which looks round-celled when seen from above. Moreover a few species have perfect cheilocystidia and one evident pileocystidia. A wide range of colour changes of the pileipellis in KOH 5% offers a new set of useful characters. However, the unity of the genus can hardly be doubted in view of the unique small spores becoming thick-walled and dextrinoid after their liberation from the basidia. Only the genus *Rhodocollybia* Singer (Antonín & Noordeloos, 1997) has similar but usually larger spores, larger basidiocarps with a simple cutis or more often an ixocutis and a pinkish yellow to pinkish brown, never white spore print.

Some special observations should be mentioned here: some authors record coloured spore prints, e.g. Favre (1960) for what probably is true *P. pillodii* ("sporée nettement lilacin-pourpré"), but that is not the case for the few collections with a spore print or with notes on the spore print colour studied by the author.

For the single collection of *P. oligophylla* in its present concept, the collector, N. Dam, noted that some rhizoids were connected with small ochraceous tubers in the soil, as in *Collybia cirrhata* (Pers.) Quél.

TAXONOMIC POSITION OF THE GENUS

Pseudobaeospora oligophylla, the type species, was originally placed by Singer (1938) in *Baeospora*. Later Singer (1942) excluded this species with dextrinoid spores from *Baeospora* (with amyloid spores) and placed it in the new genus *Pseudobaeospora*, then thought to belong to the Tricholomataceae ('Marasmioideae'). But in the first edition of his 'Agaricales in Modern Taxonomy' Singer (1951) moved *Pseudobaeospora* to Agaricaceae tribus Lepioteae. Even in the latest edition of the same work Singer (1986) maintained the genus in the Agaricaceae (but then in tribus Cystodermateae), very recently still followed by Wasser (2002). Kühner (1980), citing good reasons, had already restored the genus in the Tricholomataceae, and this placement was followed by Bas (1995) and Kirk et al. (2001).

It is not quite clear what made Singer place *Pseudobaeospora* close to *Lepiota*. One would expect that the dextrinoid nature of the thickened mature spore wall would be stressed as an important argument, but that is not the case. *Pseudobaeospora* was considered by Singer (1963) to be closely related to the *Lepiota sericea* group (= *Sericeomyces* Heinemann, 1978); even to such an extent that Locquin's (1952) transfer of this group to *Pseudobaeospora* was accepted by him (Singer, 1975). This taxonomic solution has been strongly opposed by Kühner (1980: 146) and finally rejected by Singer (1986) too, when he excluded again the *L. sericea* group from *Pseudobaeospora*.

Morphological arguments for placing *Pseudobaeospora* in the Tricholomataceae are (1) the shape of the basidiocarp, which is more collybioid than lepiotoid; (2) the attachment of the lamellae, which is only exceptionally free, but mostly emarginate, and sometimes even adnate; (3) the absence of any sign of a veil (but the ontogeny of the basidiocarp has not yet been studied); and (4) the continuous context of stipe and pileus. The fact that the spores of *Pseudobaeospora* become secondarily thick-walled does not hold as an argument against this option, as thickening spore walls becoming dextrinoid occur also elsewhere in the Tricholomataceae, e.g. in *Rhodocollybia*, where, judging by the five European species described by Antonín & Noordeloos (1997: 119–135), viz. *R. maculata* (Alb. & Schwein.: Fr.) Singer, *R. prolixa* (Hornem.: Fr.) Antonín & Noordel., *R. fodiens* (Kalchbr.) Antonín & Noordel., *R. filamentosa* (Velen.) Antonín, and *R. butyracea* (Bolt.: Fr.) Lennox, it might be a generic character too.

Molecular studies on *P. pyrifera*, and a comparison with members of the Agaricaceae showed that it does not belong to this family, but that its position is still unclear, as the LSU sequence is close to those of *Thaxteromyces* and *Nolanea* species (Vellinga, 2003). As only *P. pyrifera* was included in Vellinga's studies, it is premature to draw conclusions for the genus as a whole.

For the moment the best solution seems to accept *Pseudobaeospora* as a member of the Tricholomataceae and to place it there near *Collybia* and its relatives.

INFRAGENERIC CLASSIFICATION

Although *Pseudobaeospora* shows a wide range of microscopic and macroscopic characters, it is very difficult to define subdivisions that look more or less natural. Rather than adopt an alphabetic order, the species are grouped here by the salient characters they share or by their overall resemblance. Nonetheless these groupings are almost certainly artificial. These groups are:

I. Albidula group. Basidiocarp white to pale buff. Clamp-connections present. Cheilocystidia absent. Pileipellis not hymenidermoid.
1. *P. albidula*. 2. *P. paulochroma*. 3. *P. bavariae*.

II. Celluloderma group. Basidiocarp coloured. Clamp-connections present. Cheilocystidia absent or present. Pileipellis hymenidermoid.
4. *P. celluloderma*. 5. *P. mutabilis*.

III. Pyrifera group. Basidiocarp coloured. Clamp-connections present. Cheilocystidia present and conspicuous. Pileipellis not hymenidermoid.
6. *P. pyrifera*. 7. *P. jamonii*. 8. *P. laguncularis*.

IV. Frieslandica group. Basidiocarp coloured. Clamp-connections present (in *P. frieslandica* only at basidia and in subhymenium). Cheilocystidia absent (except in *P. dichroa* f. *cystidiata*). Pileipellis not hymenidermoid.
9. *P. dichroa*. 10. *P. frieslandica*. 11. *P. argentea*. 12. *P. subglobispora*. 13. *P. ellipticospora*. 14. *P. pallidifolia*.

V. Pillodii group. Basidiocarp coloured. Clamp-connections absent. Cheilocystidia absent. Pileipellis a cutis.
15. *P. pillodii*. 16. *P. oligophylla*.

ADDITIONS TO THE KEY TO THE EUROPEAN SPECIES OF PSEUDOBAEOSPORA

When the first part of this paper (Bas, 2002) was already in print, another undescribed species turned up in Slovakia, characterized by the unique combination of a hymenidermoid pileipellis and distinct cheilocystidia. It has meanwhile been published under the name *P. mutabilis* Adamčík & Bas (2002), which refers to the colour change of the pileipellis after bruising. Inclusion of this species in the key requires the following changes:

(5. Pileipellis in KOH not emitting a deep red pigment.)

7. Cheilocystidia absent. Spores 4.4–6.4 × 3.3–4.4 µm, with average Q = 1.30–1.40 ..... *P. pallidifolia* Bas, Gennari & Robich

7. Cheilocystidia present. Spores 2.8–3.9 × 2.6–3.5 µm, with average Q = 1.05–1.10.

7'. Pileipellis made up of erect chains of inflated cells forming an irregular hymeniderm, in KOH turning pale green, sometimes pale violet at first *P. mutabilis* Adamčík & Bas

7'. Pileipellis made up of repent to ascending, at centre disorderly arranged, towards margin more radial chains of inflated cells, in KOH turning blue-green to brownish green ..... *P. pyrifera* Bas & L.G.Krieglst.

Because it is possible that the colour change of the pileipellis in KOH is in general somewhat variable and in *P. mutabilis* is not very pronounced, that species is also keyed out with the species that have distinct cheilocystidia.

(9. Lamellae violaceous to lilacinous ... Cheilocystidia usually clavate, etc.)
9'. Pileipellis composed of erect chains of inflated cells, forming an irregular hymeniderm ..... *P. mutabilis* Adamčík & Bas
9'. Pileipellis not composed of erect chains of inflated cells 11

A re-examination of the type *P. frieslandica* revealed a wider range of size and length-breadth ratio of the spores than given in the original description and in the key in part I of this paper, which has to be corrected accordingly:

16. Pileipellis consisting of a thin but distinct suprapellis of 2.0–4.5(–6.0) µm wide hyphae over a thick broad-celled subpellis. Lamellae crowded (L = 26–32), dark violaceous grey. Spores (3.5–)3.9–4.9 × 2.6–3.8 µm, Q = (1.15–)1.20–1.55(–1.60), average Q = 1.30–1.50 ..... *P. frieslandica*
16. Pileipellis without a suprapellis of narrower hyphae. Lamellae less crowded (L = 8–22), violet or whitish to cream. Spores similar or larger, up to 6.4 µm long 17

DESCRIPTIONS OF THE SPECIES

Not all of the following descriptions are congruent. For the macroscopic descriptions this is caused by the many incomplete field notes (although colourslides were sometimes a great help). Therefore characters on which no information is available are not mentioned. The microscopic descriptions are sometimes incomplete because the scanty material did not allow further analysing.

I. **Albidula** group

Basidiocarp white to pale buff.

1. **Pseudobaeospora albidula** Bas — Fig. 1

Pseudobaeospora albidula Bas, Persoonia 18 (2002) 119.

Basidiocarps very small to small and pale, terrestrial, single or in small groups. Pileus 2–8(–10) mm in diameter, at first hemispherical, later conico-convex to obtusely conical, with margin inflexed when young, finally expanded, not translucently striate, white to greyish white or buff, at centre sometimes ± brownish, silky to (sub)felted or furfuraceous. Lamellae rather distant (L = 11–17; l = 0–1), adnate to emarginate, at first whitish to pale cream, later pale buff to pale yellow. Stipe 14–30 × 0.1–0.6(–1.0) mm, sometimes tapering downwards, sometimes slightly rooting, at first white to greyish-whitish, later becoming pale ochraceous or somewhat pinkish buff, with age darkening to brownish or dark reddish brown at base, flocculose to silky-fibrillose, at apex pruinose to granulose-flocculose, at base sparsely lanose-substrigose. Smell ± fungoid in one case. Spore print colour (recorded only for *ND 01014*) white.

Spores [60/6] 3.4–4.3(–4.5) × (2.6–)2.9–3.5(–3.7) µm, Q = 1.05–1.35, average Q = 1.15–1.20, subglobose to ellipsoid, at first thin-walled and non-amyloid, thick-

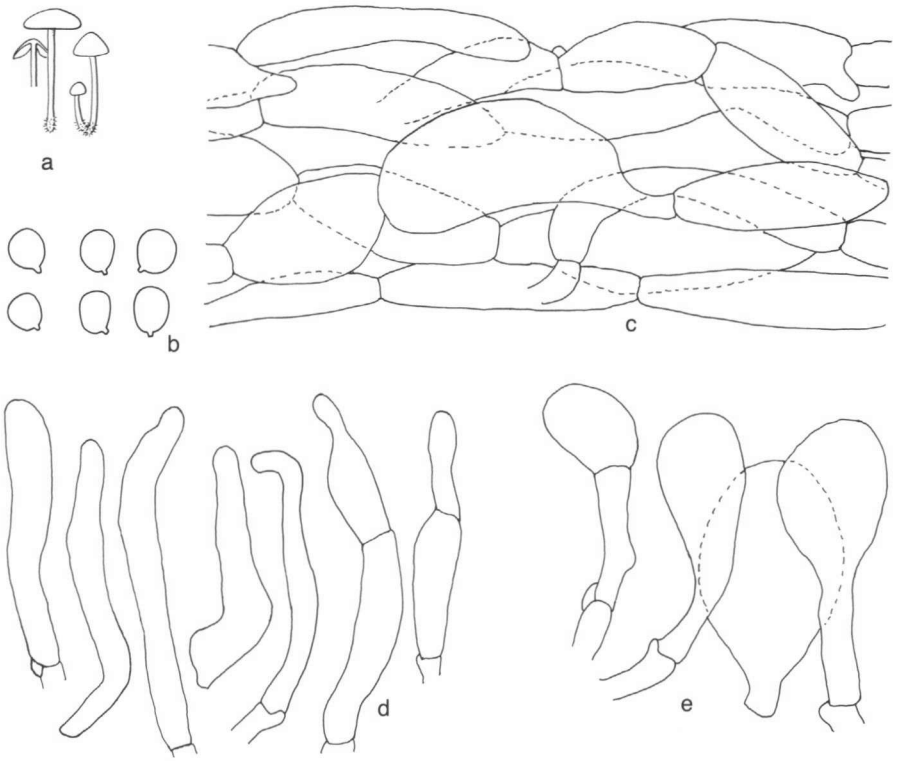

Fig. 1. *Pseudobaeospora albidula*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (radial section) × 1000; d. caulocystidia × 1000; e. aberrant caulocystidia of *K(M) 8103* × 1000.

walled and dextrinoid, congophilous, and cyanophilous when fully mature, smooth. Basidia (15–)18–22 × 4.0–5.5(–6.0) μm, 4-spored, with inconspicuous clamp-connection. Sclerified basidia absent or present but then usually rather scarce. Cheilocystidia absent. Hymenophoral trama subregular, consisting of 5–20(–29) μm wide hyphae, constricted at septa; subhymenium very narrow (± 8–9 μm) and densely ramose to subcellular. Pileipellis almost colourless to very pale brownish in KOH, consisting of radial chains of inflated, thin-walled, colourless cells 10–65(–90) × (3.5–)10–32(–37) μm, sometimes with terminal, cystidioid, attenuate to subutriform or lageniform cells 26–45 × 11–19 μm. Trama of stipe made up of (1.5–)3–20 μm wide, frequently septate, cylindrical, longitudinal hyphae. Caulocystidia at apex of stipe (8–)21–34(–47) × 2–6.5 μm, filiform often with slightly widening and slightly thick-walled apex to narrowly lageniform, rarely subclavate, but in *K(M) 8103* nearly all clavate and 6–16(–20) μm wide, often in dense clusters, sometimes septate. Clamp-connections present.

Habitat & distribution — On calcareous loam or on forest litter e.g. of *Fagus*, sometimes under *Mercurialis perennis*, but also collected on calcareous heath (*Pulsatillo–Caricetum humilis* tending towards *Gentiana–Koelerietum*) and there hidden under grasses. Rare but widespread in western Europe (England, Germany, the Netherlands).

Collections examined. ENGLAND: Surrey, Mickleham Downs, 30.VII.1988, *A. Henrici, K(M) 1031* (holotype, K); ditto, 28.IX.1988, *K(M) 8103*; ditto, 3.X.1990, *K(M) 8102*; ditto, 14.XII.1993, *K(M) 8104* (all four at K). — GERMANY: Bavaria, Niederbayern, Kelheim, 30.X.1998, *L.G. Krieglsteiner 7036/4* (STU). — THE NETHERLANDS: prov. Limburg, Valkenburg, Schaelsberg, 22.VII.2001, *N. J. Dam, ND 01014* (L).

In the field basidiocarps of this species could perhaps be mistaken for those of *Collybia cirrhata* or *Cystolepiota seminuda* (Lasch) Bon. However, the first species has a very smooth and glabrous pileipellis consisting of narrow, 5–6 μm wide hyphae embedded in a gelatinous matter, and larger and considerably more slender spores (4.5–6.0 × 3.0–3.5 μm, average Q = 1.6–1.8), which do not become dextrinoid. *Cystolepiota seminuda* has a powdery-granulose pileipellis, much more crowded lamellae (L = 30–40) and small but ellipsoid to cylindrical, non-dextrinoid spores (3.5–5.0 × 2.0–3.0 μm, average Q = 1.45–1.95). The species is perhaps related to *P. flavescens* Singer; see under extra-limital species.

2. **Pseudobaeospora paulochroma** Bas — Fig. 2

Pseudobaeospora paulochroma Bas, Persoonia 18 (2002) 121.

Basidiocarps small, terrestrial, in small group. Pileus 6–10 mm in diameter, conico-convex, whitish with pale buff centre, under lens minutely felted, with non-striate margin. Lamellae rather crowded (L = 19–24, l = 1–3), nearly free, cream-buff, ventricose, somewhat intervenose. Stipe 11–15 × 0.7–1.0 mm, slightly attenuate upwards, pale brownish buff, minutely whitish fibrillose, at base whitish felted or with sparse white rhizoids. Smell slightly unpleasant.

Spores [20/1] 3.8–4.5 × 2.9–3.5(–3.8) μm, Q = (1.10–)1.20–1.35, average Q = 1.25, subglobose to ellipsoid, at first thin-walled and non-amyloid, when fully mature becoming thick-walled, dextrinoid, strongly cyanophilous, and weakly metachromatic in cresyl blue, smooth. Basidia 18–24 × 4.2–5.2 μm, 4-spored, with clamp-connection. Sclerified basidia not rare. Cheilocystidia absent. Hymenophoral trama subregular, made up of up to 18 μm wide hyphae constricted at septa; subhymenium narrow, densely ramose. Pileipellis yellow in KOH, with very thin suprapellis of radial to slightly interwoven, 3–7(–9) μm wide, cylindrical hyphae over a subpellis of hyphae made up of shorter, up to 15(–18) μm wide, inflated cells. Pileitrama composed of loosely interwoven chains of up to 25(–30) μm wide cells, without a layer of agglutinate narrow hyphae. Trama of stipe light yellow in KOH, made up of longitudinal, cylindrical, frequently septate, 4–14 μm wide, rather thin-walled hyphae. Caulocystidia (at apex of stipe) forming a dense, ± 60–90 μm thick turf of entangled, 4–7 μm wide, septate hyphae ± perpendicular to surface, with slightly thickened walls and ± cylindrical to slightly irregular apical cells 26–55 × 4–7.5 μm. Clamp-connections present.

Habitat & distribution — On needle carpet under *Juniperus communis*. Only known from the type locality in Denmark.

Collection examined. DENMARK: Jutland, Djursland, Mols Bjerge near Ebeltoft, surroundings of Mols Laboratoriet, 23.IX.1979, *C. Bas 7516* (holotype, L).

Pseudobaeospora paulochroma differs from *P. albidula* in more crowded lamellae (L = 19–24 versus L = 11–17), somewhat larger basidiocarps, and the presence of a

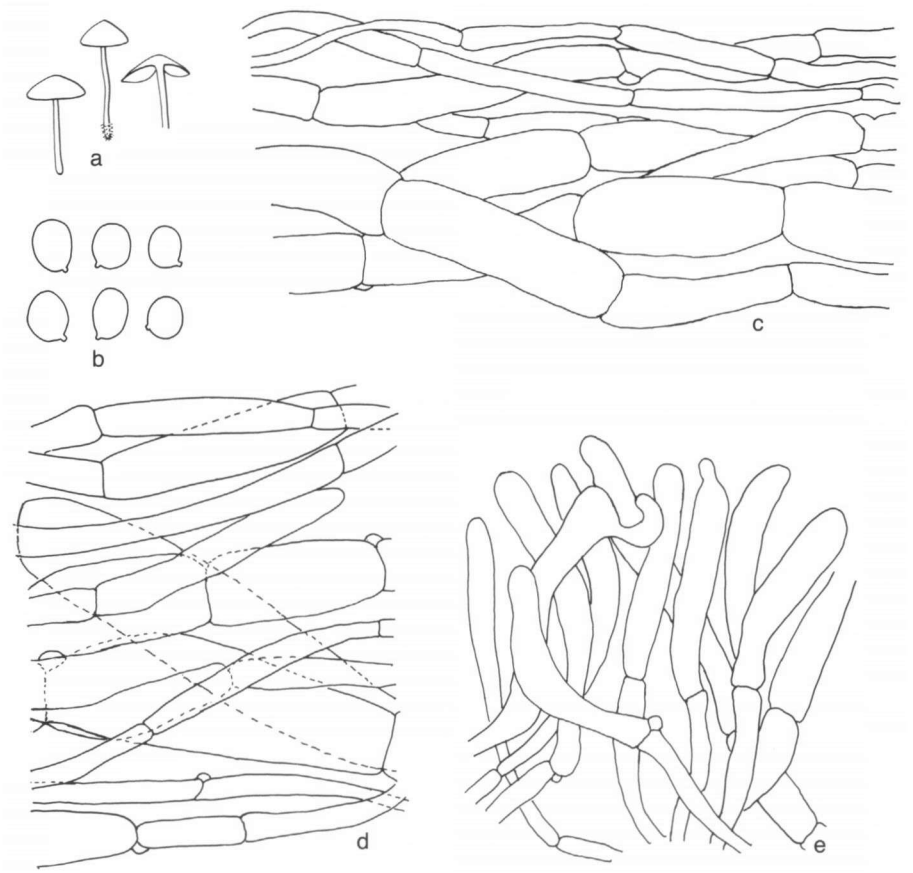

Fig. 2. *Pseudobaeospora paulochroma*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (radial section) × 1000; d. pileipellis (scalp) × 1000; e. cluster of caulocystidia × 1000.

thin but distinct suprapellis. It differs from *P. bavariae* in the homogeneous trama of the pileus, the non-anastomosing lamellae, and the basal white felt and/or rhizoids. The species is perhaps related to *P. flavescens* Singer; see under extra-limital species.

3. **Pseudobaeospora bavariae**, *nom. prov.* — Fig. 3

Basidiocarp moderately small, terrestrial, single. Pileus ± 15(–20) mm in diameter, expanded, with depressed centre with slight umbo and arched margin, sordid white, somewhat silky, but under strong lens minutely felted-subtomentose. Lamellae emarginate to almost free, fairly crowded (L = ± 30, l = 3(–7)), whitish, rather irregular, anastomosing and intervenose, fairly broad, with entire, concolorous edge. Stipe ± 27 × 1.5–2 mm, slightly rooting, pale reddish greyish with sparse whitish, longitudinal fibrils, pruinose at apex and locally elsewhere, but at base with orange-yellow rhizoids. Context of pileus somewhat tenacious.

Spores [20/1] 3.5–4.4 × 3.0–3.5 μm, Q = (1.05–)1.15–1.35, average Q = 1.2, broadly ellipsoid to ellipsoid, rarely subglobose, at first thin-walled and non-amyloid, becoming thick-walled when mature and then distinctly dextrinoid, congophilous, strongly cyanophilous, and metachromatic in cresyl blue. Basidia 19–24 × 5.1–5.5 μm, 4-spored, with indistinct clamp-connection. Cheilocystidia absent. Hymenophoral trama regular, made up of 3.5–17 μm wide hyphae; broader ones constricted at septa; subhymenium ± 12–16 μm thick, densely ramose. Pileipellis a cutis, pale sordid yellowish in KOH, made up of (sub)radial to somewhat interwoven chains of cylindrical to slightly inflated cells, 18–45 × 2.5–12(–14) μm, in lower part hyphae slightly broader, up to 21 μm wide. Context of pileus in upper part rather similar to lower part of pileipellis, but chains more irregular and more loosely arranged; lower part made up of densely packed, agglutinate, slightly thick-walled, narrow, 2.5–6(–8) μm wide hyphae. Trama of stipe composed of longitudinal, cylindrical, up to 18 μm wide, frequently septate hyphae. Caulocystidia at apex of stipe as dense clusters of short hairs with cystidioid apical cells 15–36(–56) × 5–10 μm. Rhizoids rather bright straw-yellow in KOH, consisting of 1.7–3.1 μm wide hyphae with very slightly thickened walls. Clamp-connections present.

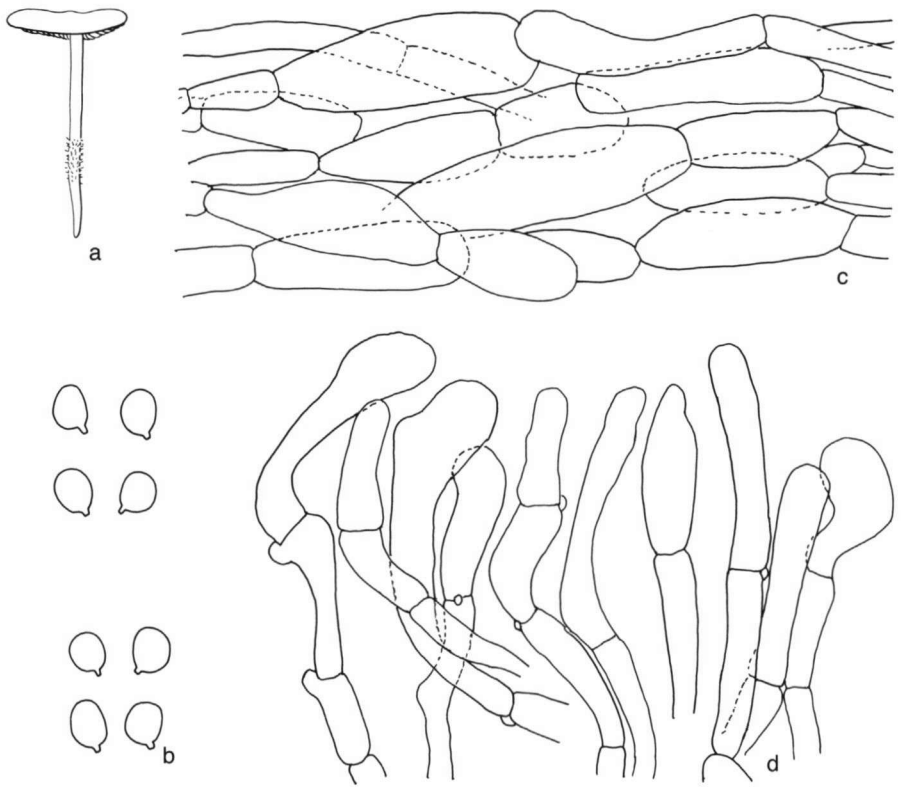

Fig. 3. *Pseudobaeospora bavariae*. a. Basidiocarp × 1; b. spores × 1500; c. pileipellis (radial section) ×1000; d. caulocystidia × 1000.

Habitat & distribution — In forest of *Quercus, Fagus*, and *Pinus* on limestone ('Muschelkalk') in southern Germany.

Collection examined. GERMANY: Bavaria, Karlstad, Pillenberg near Himmelstadt, 14.IX.1994, *L.G. Krieglsteiner s.n.* (STU).

The only specimen available of the present taxon has three characters hitherto not observed in any of the other species of *Pseudobaeospora*, viz. (1) anastomosing and intervenose lamellae; (2) orange-yellow rhizoids at the base of the stipe; and (3) a somewhat tenacious pileus context, because of the presence of a layer of agglutinate, relatively narrow hyphae. Nevertheless, the characters of the spores mark it as a true member of the genus. However, just because of these somewhat aberrant characters, it seems better to wait for more material, before describing it as a new taxon.

II. **Celluloderma** group

Pileipellis made up of erect chains of inflated cells forming an irregular hymeniderm or intermediate between a hymeniderm and an irregular epithelium. Cheilocystidia absent or present.

4. **Pseudobaeospora celluloderma** Bas — Fig. 4

Pseudobaeospora celluloderma Bas, Persoonia 18 (2002) 119.

Basidiocarps very small with very slender stipe, terrestrial. Pileus 1–4.5 mm in diameter, at first hemispherical, then convex to conico-convex or broadly conical, finally plano-convex, hygrophanous, when moist purple (e.g. K. & W. 15C7) to reddish violet, sometimes greyish vinaceous (Munsell 5 YR 3/2, but slightly more vinaceous), strongly translucently striate (sometimes up to centre), paling when drying out, e.g. to pale lilacinous (± K. & W. 15A4) smooth, glabrous, minutely micaceous. Lamellae (sub)distant (L = 7–9(–11); l = (0–)1(–3)), broadly adnate to emarginate, sometimes with short decurrent tooth, concolorous with pileus, with concolorous entire edge. Stipe 11–35 × 0.1–0.8 mm, filiform to subcylindrical, sometimes undulating, at base occasionally attenuate and slightly rooting, concolorous with pileus, but sometimes slightly paler at apex and slightly darker at base, subfibrillose to glabrous, white pruinose to flocculose at apex, white to pale felted to substrigose at base, with or without whitish to brownish rhizoids.

Spores [64/6] (3.0–)3.5–4.4 × 2.6–3.5 μm, Q = (1.10–)1.15–1.40(–1.55), average Q = (1.20–)1.25–1.35, subglobose to ellipsoid, at first thin-walled and non-amyloid, later becoming thick-walled, weakly dextrinoid, congophilous, cyanophilous, and metachromatic in cresyl blue. Basidia (16–)19–24 × 4.3–5.6 μm, 4-spored, with clamp-connection, but also frequently with pseudoclamps. Sclerified basidia absent to scarce. Cheilocystidia absent. Hymenophoral trama regular, made up of 3–13 μm wide hyphae with cylindrical to slightly inflated cells; subhymenium narrow, densely ramose to subcellular, often with pseudoclamps. Pileipellis in KOH pale brownish to pale pinkish-greyish, constructed as a somewhat irregular hymeniderm tending towards an epithelium, round-celled when seen from above, made up of erect elements with terminal cells (6–)10–38 × 6–29 μm, clavate or broadly clavate to subglobose. Trama of stipe (near apex) consisting of 2.5–12 μm wide, closely packed, multiseptate, lon-

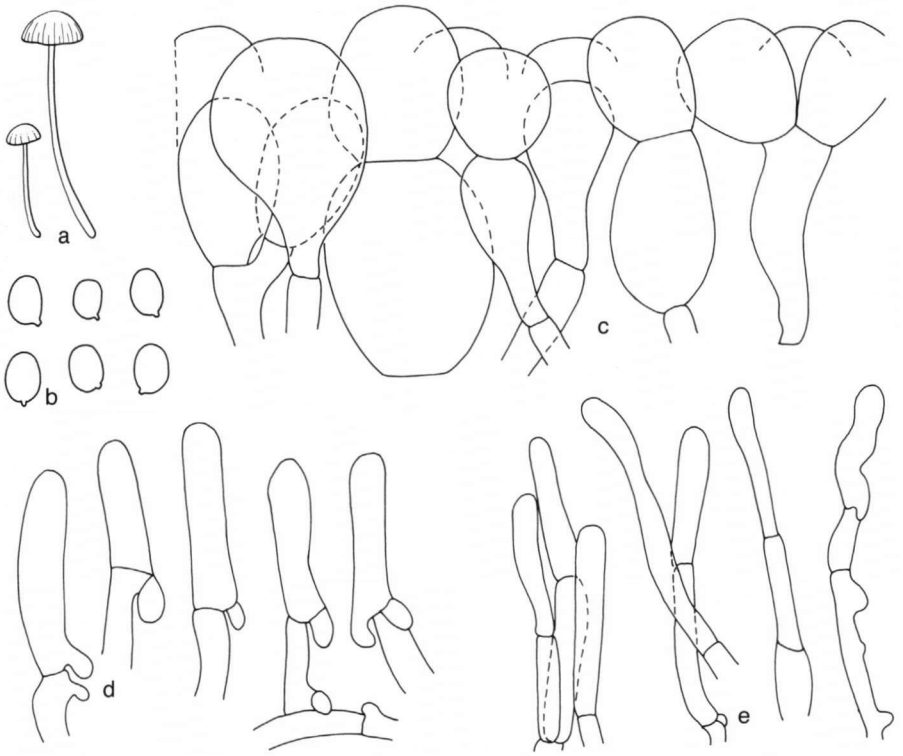

Fig. 4. *Pseudobaeospora celluloderma*. a. Basidiocarps × 2; b. spores × 1500; c. pileipellis (radial section) × 1000; d. basidioles with pseudoclamps × 1000; e. caulocystidia × 1000.

gitudinal hyphae. Caulocystidia scattered or in small clusters, 17–28(–38) × 1.5–6.0 μm, filiform to subclavate. Clamp-connections present.

Habitat & distribution — On or among woody debris, often in moist environment, in deciduous (*Fagus/Fraxinus*) and mixed (*Picea/Alnus*) forests, at ruderal places (*Epilobium/Rubus idaeus*), but also deep in felted turf of moist meadows, with preference for nutrient-rich or calcareous soils. Rare but widespread in northern, western, and central Europe.

Collections examined. ENGLAND: Surrey, Mickleham Downs, 19.VI.1991, *A. Henrici, K(M) 17188* (holotype, K); ditto, 7.IX.1986, *A. Henrici, K(M) 8100* (K). — GERMANY: Hessen: Korbach, nature reserve Meineringhausen, 7.VIII.2000, *L.G. Krieglsteiner 269* (STU); ditto, Giessen, nature reserve Brühl (at three localities), 4.IX.2000, *L.G. Krieglsteiner s.n.* (STU). — FINLAND: Karelia, Kb. Ilomantsi, near Mekrijärvi Biological Station, 26.VIII.1996, *T. Læssøe 4237* (C). — SWEDEN: Medelpad, Torp par., Getberget, 14.IX.1991, *T. Læssøe 2361, K(M)17683* (K).

Because of its minute and slender basidiocarps, its strongly translucently striate pileus when moist, and its pileipellis constructed as an irregular hymeniderm, *P. celluloderma* is very well characterized. The only other species with a hymenidermoid pileipellis is *P. mutabilis* Adamčík & Bas, but that has cheilocystidia, somewhat larger and more sturdy basidiocarps (pileus 7–13 mm wide, stipe 20–30 × 1–2 mm) and slightly smaller and more roundish spores (3.0–3.7 × 2.7–3.5 μm, Q = 1.05–1.15).

It is remarkable that in three of the collections of *P. celluloderma* examined pseudoclamps have been found at the basidia and in the subhymenium.

This species is one of the brightest coloured in the genus. Collectors compared its colours with those of *Laccaria amethystina* and young *Mycena sanguinolenta*.

5. **Pseudobaeospora mutabilis** Adamčík & Bas — Fig. 5

Pseudobaeospora mutabilis Adamčík & Bas, Mycotaxon 84 (2002) 272.

Basidiocarps small, terrestrial. Pileus 7–13 mm in diameter, hemispherical to almost flat, usually with low umbo at centre, dark grey-brown to dark violaceous grey-brown (K. & W. 10F3 to 11E3), at margin greyish pink to pinkish grey (11B4 to 11C3), changing to bluish grey when bruised; surface finely granulose, smooth; margin not or weakly translucently striate. Lamellae almost free, crowded (L = ± 18, l = 1–3), violet, with concolorous, entire edge. Stipe 20–30 × 1–2 mm, with similar colours as pileus, finely pruinose, with white tomentum at base, hollow. Context greyish pink. Smell not distinct. Taste mild.

Spores [20/2] 3.0–3.7(–3.9) × 2.7–3.5(–3.7) µm, Q = (1.00–)1.05–1.15(–1.25), average Q = 1.10, subglobose, rarely globose or broadly ellipsoid, colourless, at first thin-walled and non-amyloid, later thick-walled and dextrinoid, congophilous, strongly cyanophilous, and not or very weakly metachromatic in cresyl blue, smooth. Basidia 19–27 × 5–6.5 µm, 4-spored, with clamp-connection. Sclerified basidia scattered to

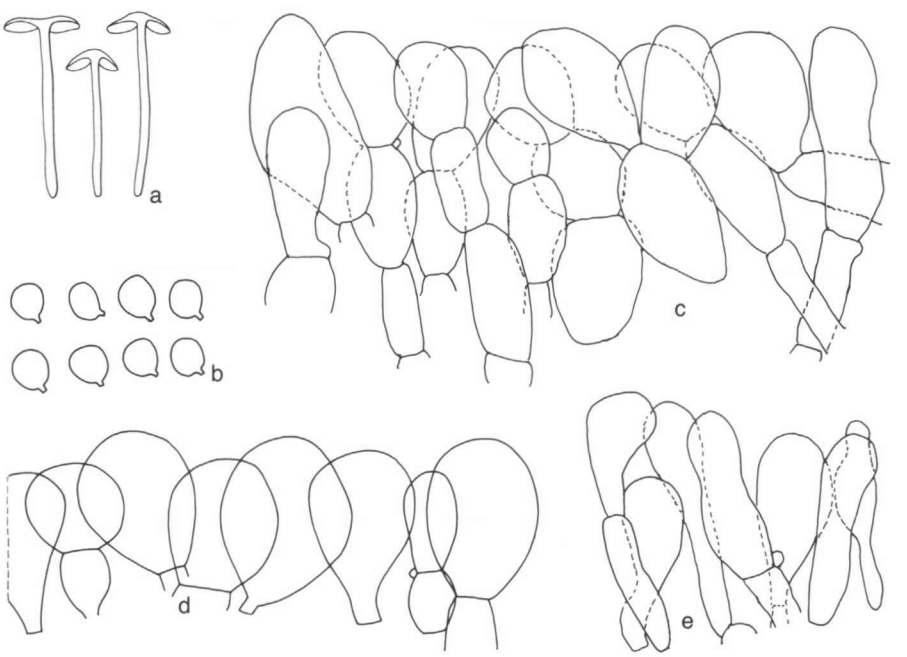

Fig. 5. *Pseudobaeospora mutabilis*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (radial section) × 1000; d. cheilocystidia × 1000; e. caulocystidia × 1000.

rather abundant, with dextrinoid wall. Cheilocystidia (8–)10–24(–30) × (5–)7–11(–18) µm, mostly broadly to very broadly clavate, less frequently narrowly clavate or subglobose, rarely utriform to subcapitate, or somewhat irregularly shaped, thin-walled, and colourless. Hymenophoral trama consisting of rather irregularly disposed to subparallel hyphae made up of inflated 5–15 µm wide cells; subhymenium narrow and very dense. Pileipellis in KOH at first turning pale violet or not, but soon becoming pale green, almost a hymeniderm, consisting of erect chains of inflated cells; terminal cells (9–)15–30(–35) × (5–)7–14(–17) µm, predominantly broadly clavate to (sub)globose, more rarely narrowly clavate to subcylindrical or subutriform, smooth, thin-walled, and colourless. Trama of stipe made up of densely packed, strictly parallel, 4–11 µm wide hyphae with slightly thickened walls. Caulocystidia at apex of stipe single or more frequently in clusters, 12–29(–37) × 4–11 µm, broadly to narrowly clavate, utriform, or somewhat irregularly shaped, rarely (sub)capitate. Clamp-connections present in all tissues.

Habitat & distribution — In high vegetation of *Molinia caerulea* near *Betula* and *Frangula alnus*, on moist sand, together with species of *Clavaria, Clavulinopsis, Entoloma, Hygrocybe,* and *Ramariopsis*. Known only from the type locality in Slovakia.

Collections examined. SLOVAKIA: Záhorská nížina lowland, Abrod National Reserve, 12.VIII.1998, *Adamčík & Stanová s.n.* (SAV); ditto, 10.IX.1998, *Adamčík, Stanová & Viceníková s.n* (SAV); ditto, 15.IX.1999, *Adamčík, Antonín & Kabát s.n.* (SAV).

Pseudobaeospora celluloderma has a pileipellis that is similar, but it does not have cheilocystidia, has much smaller basidiocarps (pileus 1.0–4.5 mm in diameter, stipe 11–35 × 0.1–0.8 mm), a strongly translucently striate pileus when moist, and somewhat larger and more ellipsoid spores (3.5–4.4 × 2.6–3.5 µm, average Q = (1.20–)1.25–1.35).

Pseudobaeospora mutabilis has many characters in common with *P. pyrifera* Bas & L.G. Krieglst., but that species has a pileipellis that consists of rather irregularly disposed, short, inflated cells forming a more or less pseudoparenchymatic tissue at the centre of the pileus, and around the centre is made up of repent chains of inflated cells. Moreover, its basidiocarps seem to be somewhat sturdier (pileus 5–23 mm in diameter, stipe 11–35 × 1.5–3 mm) and the lamellae more crowded (L = 20–24, l = (1–)3–7).

III. **Pyrifera** group

Very distinct cheilocystidia present. Pileipellis not hymenidermoid, not emitting a deep red pigment in KOH.

6. **Pseudobaeospora pyrifera** Bas & L.G. Krieglst. — Fig. 6

Pseudobaeospora pyrifera Bas & L.G. Krieglst., Z. Mykol. 64 (1998) 204.
Selected descriptions & icones: L.G. Krieglst., Regensb. mykol. Schr. 9 (2) (1999) 744, Pl. 37.

Basidiocarps rather small, comparatively sturdy, terrestrial, single or in small groups, rarely subfasciculate. Pileus 5–23 mm in diameter, 5–10 mm high, from obtusely conical or hemispherical to plano-conical or plano-convex, with or without obtuse umbo, with margin at first somewhat inflexed and slightly crenulate, finally more or less flattened

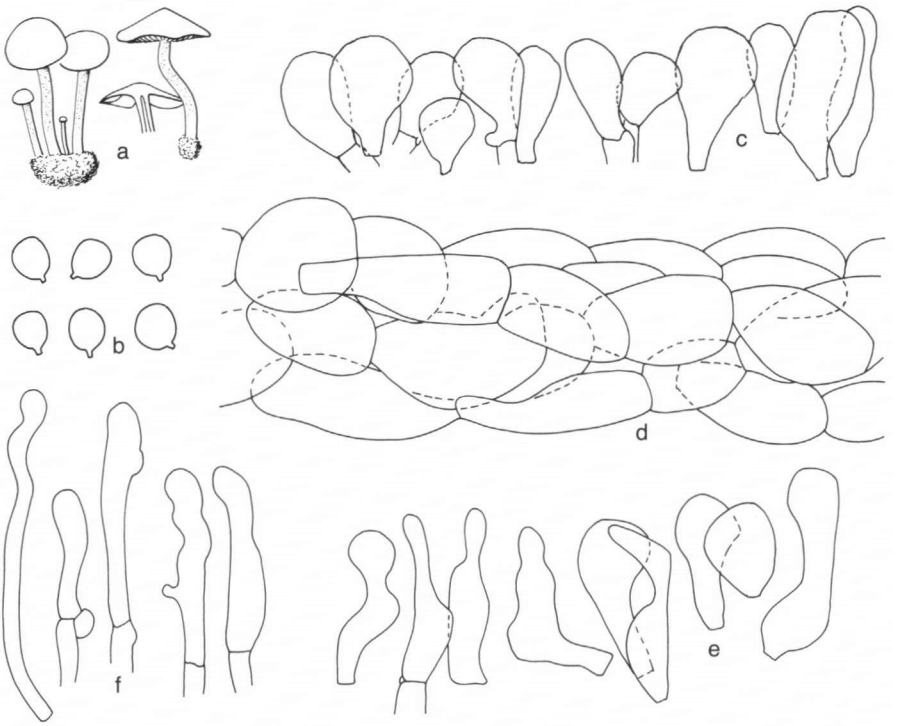

Fig. 6. *Pseudobaeospora pyrifera*. a. Basidiocarps × 1; b. spores × 1500; c. cheilocystidia × 1000; d. pileipellis (radial section) × 1000; e, f. caulocystidia × 1000 (e. in type, f. in *De Vries 1869*).

to subumbilicate, not or only slightly hygrophanous, not striate at margin, from very dark purplish brown (Munsell 5 YR 3/3 to 10 YR 4/4) to moderately dark vinaceous brown to pinkish brown at centre, but paler brownish pink at margin, somewhat pinkish pruinose to minutely felted-granular (overall impression a pruinose sordid pink (10 YR 5/4) to pruinose, brownish vinaceous pink (± 5 YR 7/4)), in dry condition whitish hoary. Lamellae deeply emarginate with slightly decurrent tooth to almost free, moderately crowded (L = 20–24, l = (1–)3–7), rather narrow to ventricose, fairly dark reddish violaceous to violaceous pink, becoming lilacinous ochraceous to greyish ochraceous, with concolorous, entire to slightly irregular edge. Stipe 11–35 × 1.5–3.0 mm, cylindrical, solid to slightly hollow, dark vinaceous red-brown, at first minutely whitish pruinose-flocculose, later lower part subfibrillose to almost glabrous, with whitish felt at base. Context violaceous red, darkening when bruised. Smell indistinct. Taste mild.

Spores [40/2] 2.8–3.7(–4.2) × 2.6–3.5(–3.8) µm, Q = 1.00–1.15, average Q = 1.05–1.10, globose to subglobose, at first thin-walled and non-amyloid, becoming thick-walled, weakly dextrinoid, congophilous, cyanophilous and some metachromatic in cresyl blue when fully mature, smooth, also in scanning electron microscope. Basidia 19–23 × 5.0–5.6 µm, 4-spored, with clamp-connection. Sclerified basidia present, scattered. Cheilocystidia abundant, 10–30 × 4–13 µm, mostly broadly clavate, but also some narrowly clavate, subcylindrical, subutriform or irregularly shaped, thin- to rarely

slightly thick-walled, colourless. Hymenophoral trama regular, composed of 3–15 µm wide hyphae; subhymenium 7–10 µm thick, densely ramose to subcellular. Pileipellis made up of loosely arranged chains of inflated cells, 10–35(–42) × 6–17 µm, disorderly arranged at centre, more repent and radial towards margin, pale greenish blue to greenish brownish in KOH in dried material, deeper greenish blue in fresh material. Trama of stipe regular, consisting of 3–20 µm wide, frequently septate, thin- to slightly thick-walled hyphae, reddish brown with greenish-yellowish tinge in KOH. Caulocystidia (at apex of stipe) 12–31 × 3–10 µm, in dense clusters, filiform to clavate or lageniform, sometimes irregularly shaped. Clamp-connections abundant but often inconspicuous.

Habitat & distribution — In southern Germany found in *Pruno-Fraxinetum* with *Alnus*, *Prunus padus*, *Fraxinus*, and *Carpinus*, and in *Cirsio tuberosi-Molinietum* grassland; in both habitats with *Entoloma*, *Geoglossum*, *Clavulinopsis*, *Hygrocybe*, and *Ramariopsis* species. In the Netherlands collected in a *Juniperus* stand with *Erica tetralix*, and *Cladonia*, *Entoloma*, and *Hygrocybe* species.

Collections examined. GERMANY: Bavaria, Lower Franconia, Kitzingen, 'Klosterforst', 10.IX. 1995, *L.G. Krieglsteiner s.n.* (holotype L; isotype REG). — THE NETHERLANDS, prov. Overijssel, between Rijssen and Markelo, 26.VII.1974, *B. de Vries 1869* (WAG).

Krieglsteiner (1999: 744) reported five additional collections of *P. pyrifera* from the type locality and seven collections from three other localities in Lower Franconia. At the type locality he found it sometimes to be the most abundant species.

Pseudobaeospora pyrifera can be rather easily recognized by the predominantly broadly clavate cheilocystidia, the comparatively sturdy basidiocarps, and the greenish blue to brownish green KOH reaction of the pileipellis. Moreover, the globose to subglobose spores are, together with those of *P. chilensis* E. Horak (1964) among the smallest in the genus. The latter species differs, however, from the present one by tiny, very slender basidiocarps, inconspicuous, narrow cheilocystidia, and narrower pileipellis elements.

In Europe *P. jamonii* Bas, Lalli & Lonati from Italy seems to be the closest relative of the present species. It differs, however, by the more elongate clavate to (sub)lageniform, cylindrical or irregularly shaped cheilocystidia (15–43 × 4–10 µm), the presence of a distinct suprapellis of comparatively narrow hyphae, slightly larger and slightly more ellipsoid spores (3.2–4.0 × 2.8–3.5 µm, average Q = 1.10–1.15), and a different KOH reaction of the context of the stipe (green).

7. **Pseudobaeospora jamonii** Bas, Lalli & Lonati — Fig. 7

Pseudobaeospora jamonii Bas, Lalli & Lonati, Micol. Vegetat. Mediter. 17 (2002) 32, col. pl.
Selected descriptions & icones: Jamoni & Bon, Bull. trimest. Fédér. mycol. Dauphiné-Savoie 143 (1996) 12–13, pl. on cover (as form of *P. pillodii*).

Basidiocarps small, comparatively sturdy, terrestrial. Pileus 5–25 mm in diameter, plano-convex to plano-conical with small umbo, glabrous, first greyish purple to violaceous brown or reddish brown, with darker centre, later paler, sometimes with watery spots, with non-striate margin. Lamellae fairly crowded (L = ± 16–24, l = (1–)3–7), deeply emarginate to nearly free, broad, at first lilacinous-violaceous, later more brownish beige, with paler subdenticulate edge. Stipe 15–30(–50) × 1.0–2.5 mm, ± cylindrical,

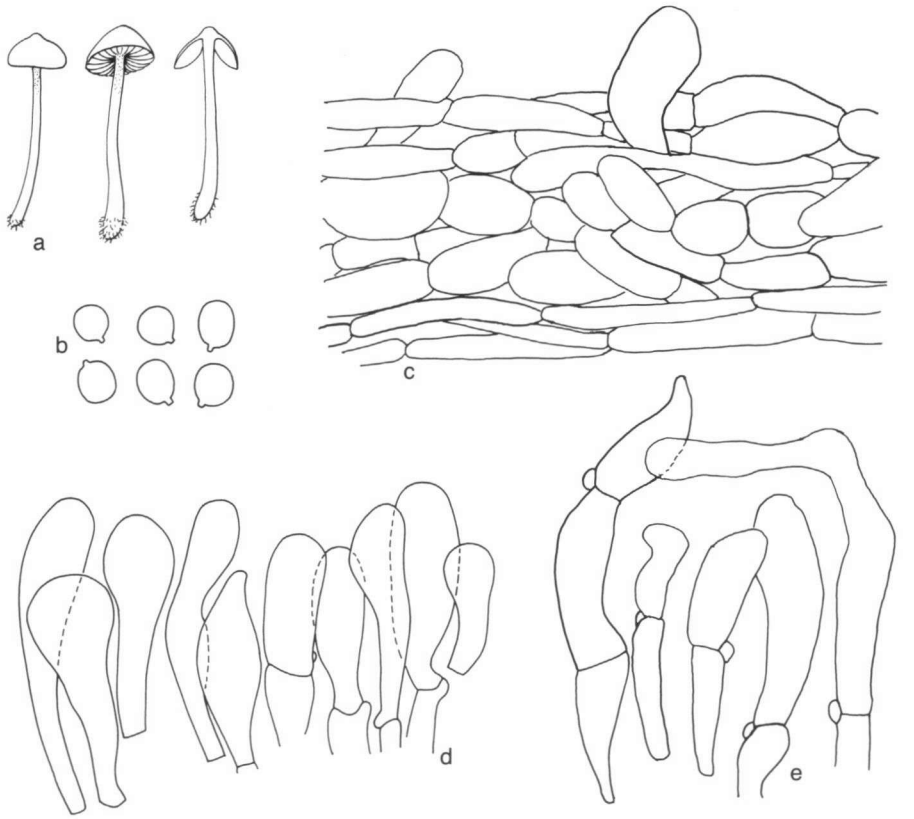

Fig. 7. *Pseudobaeospora jamonii*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (radial section) × 500; d. cheilocystidia × 1000; e. caulocystidia × 1000.

somewhat thickening downwards, with often slightly rooting, white strigose-lanose base, lilacinous-violaceous particularly at apex, becoming darker purplish brown, almost completely whitish flocculose-pruinose or only so at apex. Context violaceous in apex of stipe, purplish in cortex of stipe, elsewhere pale brownish. Smell indistinct or weakly raphanoid.

Spores [50/4] (3.0–)3.2–4.0(–4.3) × 2.8–3.5 μm, Q = 1.05–1.20(–1.30), average Q = 1.10–1.15, subglobose to broadly ellipsoid, smooth and glabrous, thin-walled at first and then non-amyloid, but later becoming thick-walled and dextrinoid, congophilous, and cyanophilous. Basidia 20–25 × 3.5–5.5 μm, 4-spored, with rather inconspicuous clamp-connection. Sclerified basidia absent to scarce. Cheilocystidia abundant, 15–43 × 4–9.5 μm, mainly narrowly clavate, but also (sub)lageniform, cylindrical or irregularly shaped, thin-walled. Hymenophoral trama regular to subregular, composed of 3.5–18 μm wide hyphae; subhymenium very dense, ± 8–11 μm thick, subcellular (difficult to analyse). Pileipellis turning greenish brownish to pale green in KOH, made up of a suprapellis of 4–10 μm wide, repent hyphae with scattered, broadly clavate, cystidioid terminal cells, over a subpellis of chains of more inflated, up to 22 μm wide cells.

Caulocystidia at apex of stipe scattered and in clusters,13–60 × 4–12 μm, filiform to slenderly clavate, subcylindrical or slender and somewhat irregular. Context of stipe regular, made up of multiseptate hyphae from 2.5 μm wide near surface to 10 μm wide at centre, green in KOH. Clamp-connections abundant.

Habitat & distribution — In mixed forest (*Alnus incana*, *Fraxinus*, *Fagus*, *Corylus*, *Picea abies*, often near *Buxus*) at 800 to 1300 m altitude in the Piémont in northwestern Italy and in the Abruzzi in central Italy.

Collections examined. ITALY: Piémont, Mont Rose, Alagna, lower valley of the Orto, 13.IX.1994, *P.G. Jamoni s.n.* (holotype, herb. Jamoni; isotype, L); Teramo, Abruzzi, San Pietro, Isola di Grand Sasso, 13.IX.1995, *G. Lalli & G. Lonati s.n.* (herb. Lalli; L).

Additional collections have been reported by Jamoni & Bon (1996) and Jamoni (1997).

Pseudobaeospora jamonii seems closely related to *P. pyrifera*. For a comparison see the discussion under that species.

In one of the specimens from San Pietro a strip of an amyloid, amorphous substance was found along the edge of some lamellae. Spores caught in this substance seemed to be amyloid, but thick-walled spores elsewhere on the same lamellae were dextrinoid. As this phenomenon could not be observed in other specimens, it is considered an inexplicable aberration without taxonomic value.

8a. **Pseudobaeospora laguncularis** Bas var. **laguncularis** — Fig. 8

Pseudobaeospora laguncularis Bas var. *laguncularis*, Persoonia 18 (2002) 121.

Basidiocarps small to very small, terrestrial, single or in small groups, sometimes subfasciculate. Pileus 3.5–8.0 mm, at first convex to broadly conical, later plano-convex to plano-conical, sometimes with a more or less pronounced umbo, purple-brown to clay-brown with or without lilacinous tinge, paler towards edge, with non-striate, slightly inflexed, somewhat crenulate margin when young, matt, glabrous, but sometimes with a pallid marginal zone. Lamellae fairly crowded (L = 20–25; l = 1–3(–7)), deeply emarginate to free, sordid cream to pale clay-brown or pale ochraceous yellow-brown. Stipe 12–25 × 0.4–1.6 mm, cylindrical or slightly tapering downwards, pale brown to grey-brown with lilacinous tinge or pinkish grey, darker towards base, subfibrillose, at apex whitish flocculose to pruinose (sometimes flocculi with brownish tips), with white tomentum and sometimes pale rhizoids at base. Smell absent or indistinct.

Spores [50/4] (3.1–)3.3–4.0(–4.4) × 2.9–3.6(–4.6) μm, Q = 1.05–1.25(–1.30), average Q = 1.10–1.15, subglobose to broadly ellipsoid, at first thin-walled and non-amyloid, later thick-walled, dextrinoid, congophilous, cyanophilous, and sometimes metachromatic in cresyl blue, smooth. Basidia 16–22 × 3.7–6.1 μm, 4-spored, but a few 2-spored seen, with clamp-connection. Sclerified basidia present, but sometimes scarce. Cheilocystidia (12–)19–49 × 2.8–8.0 μm, usually narrowly lageniform, less often filiform, subcylindrical, or irregularly shaped, often in small clusters, rather frequently with scattered, small, refractive bodies on neck and apex turning brownish-yellowish in NH_4OH and reddish in KOH. Hymenophoral trama regular to subregular, made up of septate hyphae with often somewhat inflated, (2–)4–13 μm wide cells with slightly thickened walls; subhymenium ± 5–20 μm thick, densely ramose to almost cellular. Pileipellis in KOH very pale, brownish with greenish, yellowish or reddish

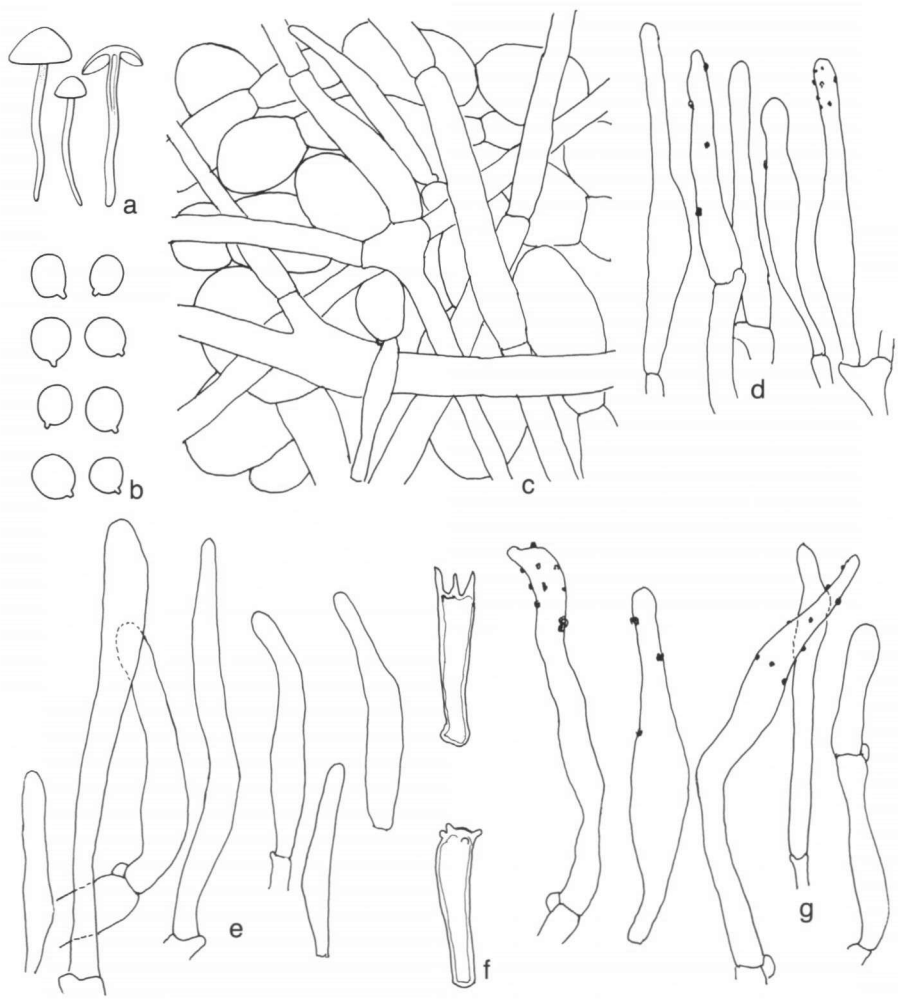

Fig. 8. *Pseudobaeospora laguncularis* var. *laguncularis*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (scalp) × 1000; d. cheilocystidia × 1000; e. pileocystidia × 1000; f. sclerified basidia × 1000; g. caulocystidia × 1000.

tinges, sometimes with small red bodies; suprapellis thin, consisting of 1.5–7.0(–13) μm wide, irregularly disposed, repent hyphae and scarce to rather abundant, narrowly lageniform to subcylindrical pileocystidia; subpellis made up of irregularly disposed chains of inflated cells 12–55 × 8–30 μm. Trama of stipe regular, composed of 5–16 μm wide cylindrical, frequently septate hyphae with slightly thickened wall. Caulocystidia (at apex of stipe) 20–80 × 3.5–8.0 μm, abundant, often in dense clusters, narrowly lageniform to filiform, often somewhat undulating or irregularly shaped, sometimes septate, with thin to slightly thickened wall, in KOH with scattered, small, red or red-brown bodies. Clamp-connections present.

Habitat & distribution — On needle carpet of *Taxus* in England and in mossy, grazed *Juniperus* stands in Germany.

Collections examined. ENGLAND: Lancashire, Silverdale, Gait Barrows, 8.X.1997, *J.C. Leedal K(M) 8107* (holotype, K); ditto, 29.VIII.1985, *J.C. Leedal K(M) 8108* (K). — GERMANY: Pommeren, eastern shore of Müritzsee, 6.XI.1973, *B. de Vries s.n.* (WAG); ditto, 23.X.1975, *B. de Vries 3182* (WAG).

Pseudobaeospora laguncularis is very well characterized by the abundant, very slender cheilocystidia, at present unique in the genus. So far it is also the only species with small, scattered, refractive bodies turning red or red-brown in KOH on caulocystidia and cheilocystidia, and sometimes also on the pileipellis, and with distinct, albeit sometimes sparse pileocystidia.

8b. **Pseudobaeospora laguncularis** var. **denudata** Bas

Pseudobaeospora laguncularis var. *denudata* Bas, Persoonia 18 (2002) 121.

This taxon has all the essential characters of the typical variety, such as abundant, very slender cheilo-, pileo-, and caulocystidia, whitish cream young lamellae, and small bodies turning reddish in KOH on cheilo-, caulo-, and pileocystidia, but it lacks the suprapellis of narrow hyphae. There is also a difference in size of the basidiocarps, viz. pileus 10–30 mm in diameter, stipe 40–60 × 2–3 mm, and lamellae 24–38. The spores are also slightly larger and slightly more ellipsoid, 3.6–4.5 × 3.2–3.5 µm, Q = 1.10–1.35, average Q = 1.20.

Habitat & distribution — Known only from the type locality in France, terrestrial under *Buxus sempervirens* and *Quercus pubescens* on calcareous soil.

Collection examined. FRANCE: Savoie, Billième, 25.X.1998, *P.A. Moreau, PAM 98102501* (holotype, L; isotype, ZT).

Two more collections from the type locality (*PAM 99101004* and *99101913*), kept in the collector's personal herbarium, have not been studied by the author.

IV. **Frieslandica** group

Basidiocarp coloured. Pileipellis not hymenidermoid. Cheilocystidia absent, except in *P. dichroa* f. *cystidiata*. Clamp-connections present, but in *P. frieslandica* only at basidia and in subhymenium.

9a. **Pseudobaeospora dichroa** Bas forma **dichroa** — Fig. 9

Pseudobaeospora dichroa Bas forma *dichroa*, Persoonia 18 (2002) 120.

Basidiocarps small but comparatively sturdy, rarely subfasciculate, terrestrial, in small groups. Pileus 10–30 mm in diameter, plano-conical to plano-convex with or without a small umbo, purple-brown to lilacinous grey (e.g. K.& W. 10D4) or violaceous grey-brown (more red-brown when dried), dry, whitish hoary to minutely felted or scurfy, non-striate or sometimes slightly so when very young. Lamellae subdistant to rather crowded (L = 18–30, l = 3), from nearly free to sinuate or adnate with short decurrent tooth, violaceous to dark purplish brown (e.g. K.& W. 10F4), (dark red-

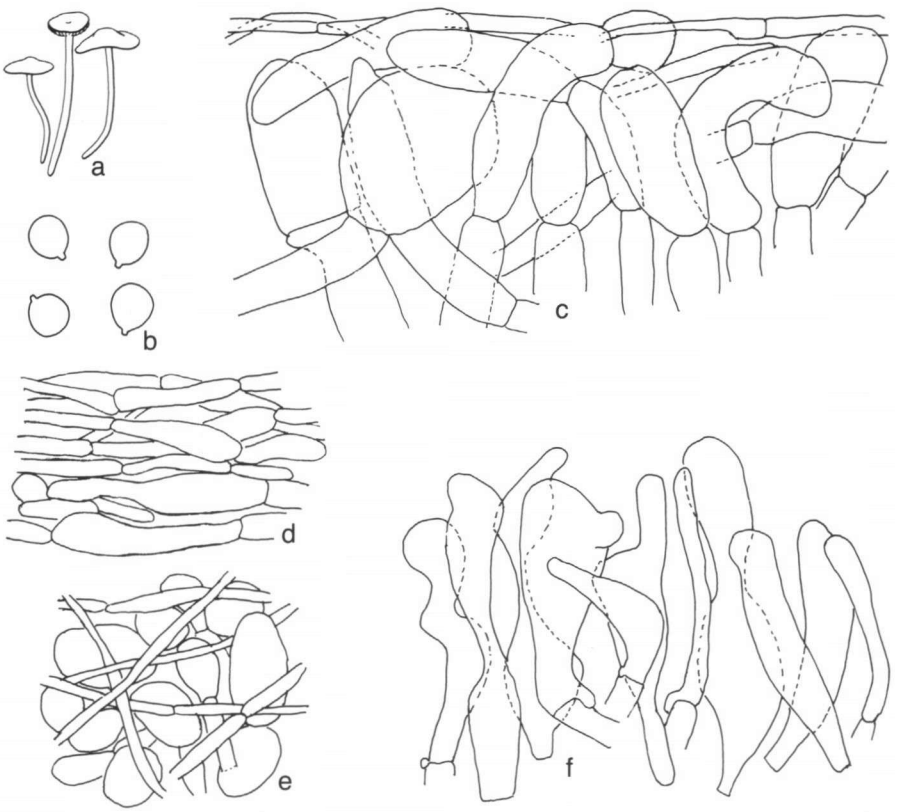

Fig. 9. *Pseudobaeospora dichroa* forma *dichroa*. a. Basidiocarps × 1; b. spores × 1500; c–e. pileipellis: c. radial section at centre × 1000; d. scalp near margin × 500; e. scalp near centre × 500; f. caulocystidia × 1000.

dish brown when dried) with concolorous to slightly paler, entire edge. Stipe 20–40 × (0.8–)1.5–2.0 mm, more or less concolorous with pileus, whitish or pale brownish flocculose to almost felted at apex, downwards sparsely white fibrillose, white felted at base. Context of stipe pale lilac-grey.

Spores [45/4] 3.0–3.9(–4.3) × 2.7–3.5 μm, Q = 1.05–1.30(–1.55), average Q = 1.10–1.20(–1.25), subglobose to broadly ellipsoid, very rarely ellipsoid, thin-walled and non-amyloid at first, becoming slightly thick-walled, weakly to distinctly dextrinoid, congophilous, cyanophilous, and metachromatic in cresyl blue when fully mature, smooth. Basidia 17.5–25 × 4.8–6.5 μm, 4-spored, with clamp-connection. Sclerified basidia scattered to abundant. Cheilocystidia absent (in type) or very scarce (in *K(M) 8101*) and then looking like outsize basidioles, 10–45 × 3.5–9.0(–17) μm, narrowly clavate, only locally present and larger part of lamella edge fertile. Hymenophoral trama regular to subregular, consisting of 2.5–15(–17) μm wide hyphae with slightly thickened wall; subhymenium 8–12 μm thick, very densely ramose. Pileipellis at first dark red in KOH, but soon emitting red clouds and becoming yellow-green, near centre heterocellular, consisting of a mixture of subglobose, ellipsoid, clavate, and elongate

cells of 20–34 × 8–19 µm, with or without a very thin suprapellis of 2.8–6.8 µm wide hyphae, near margin merely a broad-celled cutis. Trama of stipe made up of 3–18 µm wide, strictly longitudinal, frequently septate hyphae with thin to slightly thickened walls. Caulocystidia at apex of stipe abundant and in dense clusters, 17–50(–71) × 2.5–13 µm, filiform to broadly cylindrical, clavate, subutriform or sublageniform, but rather often irregularly shaped, sometimes with inflated apex, thin- to slightly thick-walled. Clamp-connections present.

Habitat & distribution — Only known from chalk downs in England; the type specimens were growing deep in mosses and grasses.

Collections examined. ENGLAND: Hampshire, Butser Hill, Queen Elisabeth Country Park, 27.IX.1992, *T. Læssøe 2906, K(M) 20450* (holotype, K); Lancashire, Silverdale, Gait Barrows, 13.X.1984, *J.C. Leedal, K(M) 8101* (K).

9b. **Pseudobaeospora dichroa** forma **cystidiata** Bas

Pseudobaeospora dichroa forma *cystidiata* Bas, Persoonia 18 (2002) 120.

This forma differs from the typical one merely by the presence of abundant cheilocystidia of 14–45 × 4–10(–17) µm, which are slenderly to broadly clavate to lageniform, sometimes filiform, but quite often irregularly shaped.

Habitat & distribution — Similar to that of the typical form.

Collections examined. ENGLAND: Lancashire, Silverdale, Waterslack Wood, 20.X.1984, *L. Livermore 19/84K, K(M) 8105* (holotype, K); Lancashire, Silverdale, Gait Barrows, 12.VIII.1985, *L. Livermore, K(M) 8106* (K).

Pseudobaeospora dichroa is a small, comparatively sturdy, dark species, easily recognized when a scalp or a radial section of the pileipellis is observed in KOH. The colour change from red to yellow-green is very striking, but has been tested only on dried material.

In the type of forma *dichroa* no cheilocystidia have been observed and in the type of forma *cystidiata* they are abundant and evident, so the formal description of a forma seems justified. However, the discovery of a few cheilocystidioid cells in *K(M) 8101*, inserted here in forma *dichroa*, renders its status somewhat shaky.

10. **Pseudobaeospora frieslandica** Bas ex Bas — Fig. 10

Pseudobaeospora frieslandica Bas, Fl. agar. neerl. 3 (1995) 134, fig. 135 (inval.); Bas, Persoonia 16 (1996) 225 (inval.); ex Bas, Persoonia 17 (1998) 140.

Basidiocarps comparatively sturdy, gregarious to subfasciculate, terrestrial. Pileus 9–16 mm in diameter, paraboloid to convex, with straight margin, very dark violaceous grey to blackish-violaceous, almost completely white hoary-pruinose when young, with age hoariness persisting at margin and central part smooth, glabrous, and matt. Lamellae crowded (L = 26–32; l = 1(–3)), free, slightly ventricose, dark greyish-violaceous, almost concolorous with pileus but slightly more violet, with concolorous, even edge. Stipe 31–43 × 1.5–2.0 mm, gradually tapering downwards, sometimes subfasciculate, fistulose with age, very dark violaceous grey to blackish violaceous, with a few whitish,

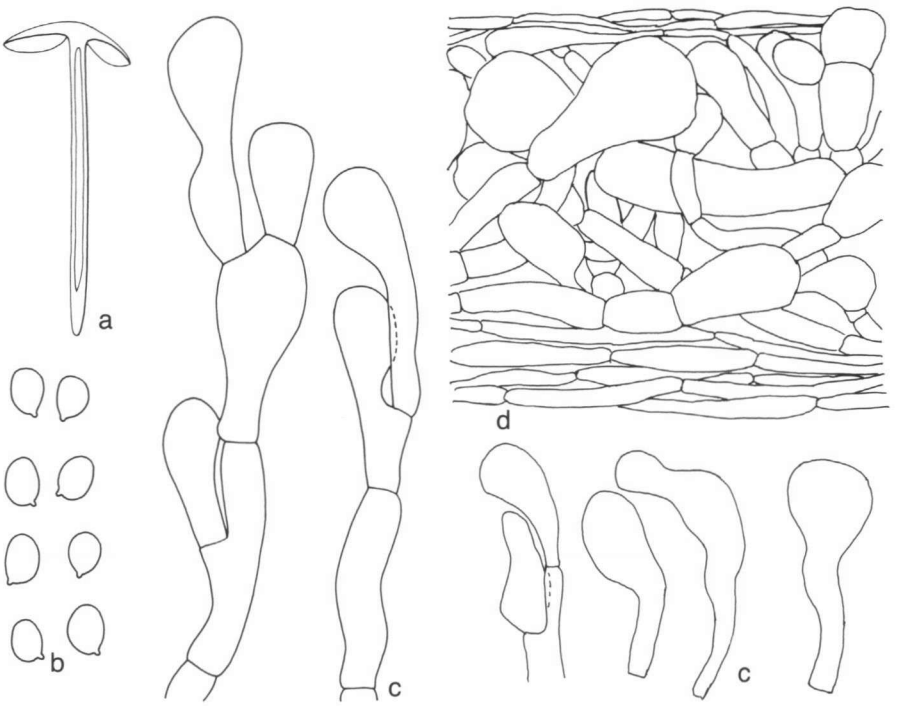

Fig. 10. *Pseudobaeospora frieslandica*. a. Basidiocarp × 1; b. spores × 1500; c. caulocystidia × 1000; d. pileipellis (radial section) × 500.

fugacious fibrils, minutely white flocculose at apex. Context more or less concolorous with surface, somewhat pallescent on drying. Smell indistinct. Spore print (very thin) white or whitish.

Spores [30/1] (3.5–)3.9–4.9 × 2.6–3.8 μm, Q = (1.15–)1.20–1.55(–1.60), average Q = 1.30–1.50, broadly ellipsoid to ellipsoid, colourless, thin-walled and inamyloid when young, thick-walled, weakly dextrinoid, congophilous, cyanophilous, and weakly or not metachromatic in cresyl blue when mature, smooth. Basidia 21–24 × 5.0–5.5 μm, 4-spored, with clamp-connection. Sclerified basidia present, scattered. Cheilocystidia lacking. Hymenophoral trama subregular, composed of hyphae with somewhat inflated, 5–18 μm wide cells with thin to slightly thickened walls; subhymenium 10–14 μm wide, consisting of slightly inflated, ramose hyphae with clamp-connections. Pileipellis pale yellowish-brownish in KOH, consisting of a ± 5–10 μm thick suprapellis (perhaps locally lacking) of 2.0–4.5(–6.0) μm wide, agglutinate, somewhat disintegrating, (sub)radial hyphae, over a ± 30–60 μm thick subpellis of irregularly disposed, broad-celled hyphae (cells (11–)20–38(–60) × 8–28 μm), thin-walled and constricted at septa, sometimes a few inflated terminal cells of subpellis somewhat projecting beyond suprapellis. Trama of stipe made up of longitudinal, 3.5–11 μm wide, brownish hyphae. Caulocystidia in clusters at apex of stipe, 17–26 × 5–15 μm, (broadly) clavate to subutriform or sublageniform, partly in chains. Clamp-connections observed only in subhymenium and at basidia.

Habitat & distribution — Known only from the type locality in the north of the Netherlands, found on humus among fallen leaves.

Collection examined. THE NETHERLANDS: prov. Friesland, Oudehornstercompagnie, 18.X.1984, *J. Wisman s.n.* (holotype, L).

Among the coloured species without cheilocystidia and with a weak KOH reaction of the pileipellis, *P. frieslandica* is easily recognized by the very dark violaceous basidiocarps with crowded lamellae, the two-layered pileipellis, fairly large, broadly ellipsoid to ellipsoid spores, and clamp-connections lacking from all tissues except hymenium and subhymenium. It seems related to *P. syringea*; see under extra-limital species.

The suprapellis of this species is rather transparent and might be overlooked in a 'scalp'. In that case one arrives in the key at *P. ellipticospora* and *P. pallidifolia*. But the first has distinctly thinner stipes (0.6–1.0 mm) and fewer lamellae (6–19) and the second has larger spores and white to pinkish cream lamellae. If the clamp-connections of *P. frieslandica* are overlooked, one arrives in the key at *P. pillodii* and *P. oligophylla*, but these two have very slender and long stipes.

A re-examination of the type revealed a wider range of size and length-breadth ratio of the spores than given in the original description and the key is corrected accordingly (see under 'Additions to the key').

11. **Pseudobaeospora argentea** Bas ex Bas — Fig. 11

Pseudobaeospora argentea Bas, Fl. agar. neerl. 3 (1995) 133, fig. 134 (inval.); ex Bas, Persoonia 16 (1996) 255.

Basidiocarps very small to small, slender, terrestrial, single or in small groups. Pileus 4.5–8.0 mm in diameter and 3.0–3.5 mm high, conical with obtuse apex and straight to slightly reflexed margin, purple-brown to brown under a silvery, aeriferous, fibrillose covering bringing about a pale beige-grey aspect (Munsell 10 YR 6–7/2, slightly tending towards 7/3) particularly when young. Lamellae deeply emarginate to nearly free, rather distant to fairly crowded (L = ± 12–16, l = 1–3), thickish, ascending, (sub)ventricose, deeply emarginate to nearly free, very pale greyish-brownish (10 YR 6–7/4) to dingy purplish (10 R 6/2), paler towards entire edge. Stipe 18–30 × 0.6–0.9 mm, equal to attenuate downwards and somewhat rooting, dingy purple (10 R 6/2) to fairly dark grey-brown (10 YR 5/3) at apex, darker dingy purple (10 R 5/3) to blackish brown (10 YR 3/3) at base, sparsely white silky fibrillose to nearly smooth, at extreme apex somewhat white to beige flocculose. Context dingy purplish (10 R 6/2) to grey-brown (10 YR 4/3 to 5/3). Smell indistinct.

Spores [30/2] 3.5–4.8(–5.0) × (2.9–)3.1–4.5 μm, Q = (1.05–)1.10–1.20(–1.30), average Q = 1.10–1.15, subglobose to broadly ellipsoid, at first thin-walled and non-amyloid, becoming thick-walled, dextrinoid, congophilous, cyanophilous, and metachromatic in cresyl blue when fully mature. Basidia 22–28 × 5.9–7.2 μm, 4-spored, with clamp-connection. Sclerified basidia present, scattered. Cheilocystidia absent. Hymenophoral trama somewhat irregular; hyphae 2.5–8.5 μm wide, slightly constricted at septa; subhymenium broadly ramose to subcellular, up to 18 μm wide. Pileipellis not changing colour in KOH, a single layered cutis made up of 5.5–12.5(–15) μm wide, cylindrical, radial hyphae slightly constricted at septa, with thin to slightly thickened

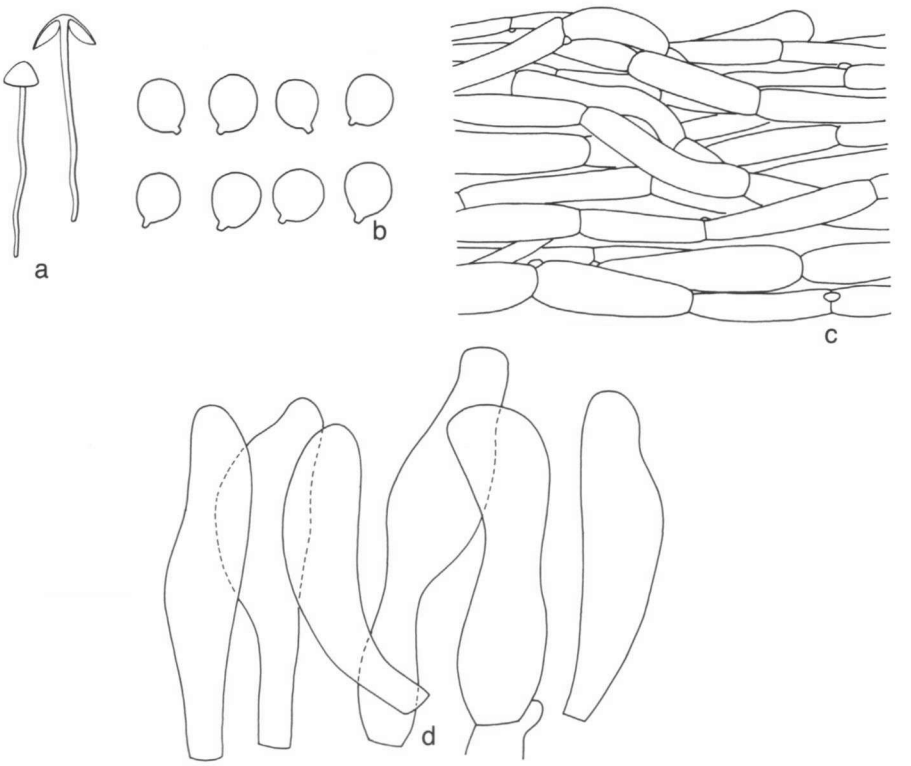

Fig. 11. *Pseudobaeospora argentea*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (radial section) × 500; d. caulocystidia × 1000.

wall, with terminal cells sometimes somewhat cystidioid and attenuate to narrowly conical; pigment parietal, but probably also very slightly encrusting. Trama of stipe consisting of longitudinal, 5–14 μm wide, thin-walled hyphae. Caulocystidia 33–57 × 8–13 μm, scattered at apex of stipe, clavate to utriform or somewhat irregularly shaped. Clamp-connections present.

Habitat & distribution — Only known from the coastal dunes in the Netherlands, on mossy, probably calcareous sand near or in scrub (*Salix repens*, *Sambucus*).

Collections examined. THE NETHERLANDS: prov. Noord-Holland, Santpoort, estate 'Duin en Kruidberg', 9.XI.1936, *R.A. Maas Geesteranus 14010* (holotype, L); inner side of outer ridge of coastal dunes south of Zandvoort, 1.XI.1996, *E.C. Vellinga (Bas 8999)* (L).

This very small to small and slender species is particularly characterized by the silvery fibrillose pileipellis made up of a single layer of radial, cylindrical hyphae.

The second collection (a single basidiocarp) deviates somewhat from the type by smaller spores (3.5–3.8 × (2.9–)3.1–3.5 μm) and by lacking purplish tinges. But as in both cases the pileipellis is a single layered cutis of radial, cylindrical hyphae and both collections are from the same area, it is assumed that only one species is involved. It seems related to *P. chilensis* E. Horak; see under extralimital species.

12. **Pseudobaeospora ellipticospora** Bas — Fig. 12

Pseudobaeospora ellipticospora Bas, Persoonia 18 (2002) 120.

Basidiocarps small and slender, sometimes fasciculate, terrestrial. Pileus ± 8–15 mm in diameter, obtusely conical to plano-conical, with age becoming plano-concave with small umbo, with margin at first inflexed, later deflexed, non-striate, violaceous to lilacinous, dry, minutely appressed-felted. Lamellae distant to rather crowded (L = (6–)8–17(–19); l = 0–3), narrowly adnate and then sometimes with short decurrent tooth, to almost free, narrow, concolorous with pileus, with entire, concolorous edge. Stipe about 32–42 × 0.6–1.0 mm, frequently slightly attenuate downwards, concolorous with pileus, at apex minutely white flocculose, lower down minutely whitish to somewhat lilacinous appressedly fibrillose. Context lilacinous-violaceous, watery in pileus. Smell and taste indistinct. Spore print white.

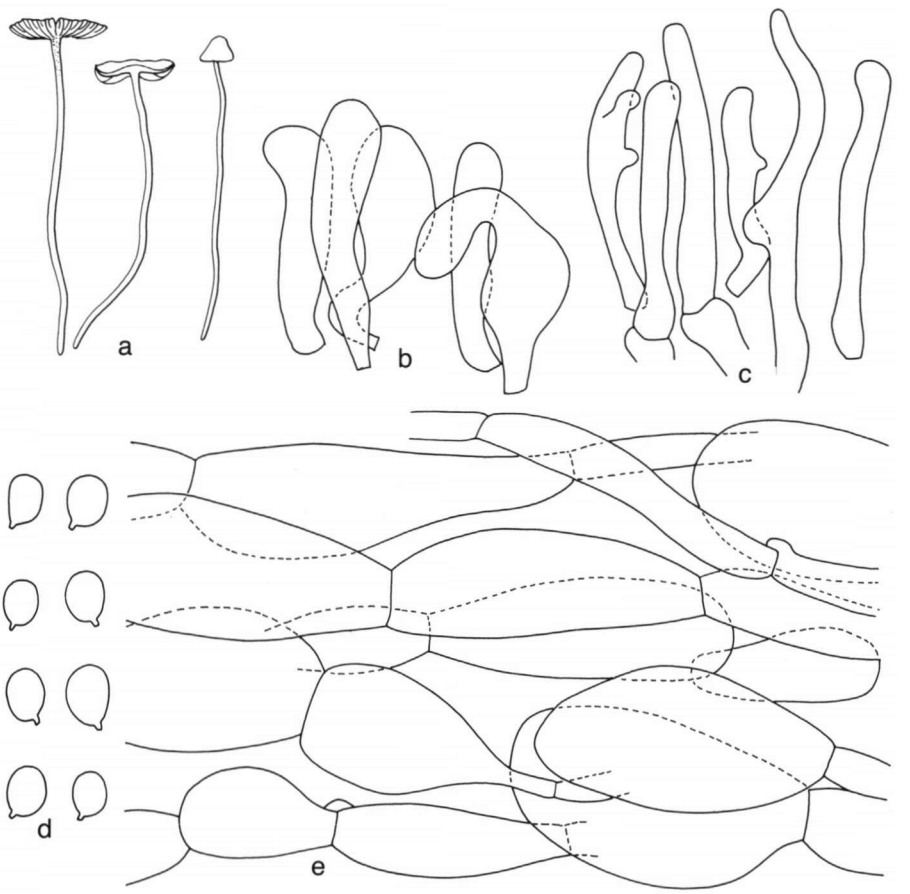

Fig. 12. *Pseudobaeospora ellipticospora*. a. Basidiocarps × 1; b, c. caulocystidia × 1000: b. in *Horak 3314*, c. in *Knudsen 24.VIII.1997*; d. spores × 1500; e pileipellis (scalp) × 1000.

Spores [38/2] 3.6–4.9(–6.2) × 2.6–3.8(–4.1) μm, Q = (1.10–)1.15–1.50(–1.70), average Q = 1.25–1.30, broadly ellipsoid to ellipsoid, at first thin-walled and non-amyloid, later thick-walled and very weakly dextrinoid, congophilous, rather weakly cyanophilous and weakly metachromatic in cresyl blue. Basidia 21–29 × 5.3–5.8 μm, 4-spored, but some 1- and 2-spored ones present, with clamp-connection. Sclerified basidia present, scattered. Cheilocystidia absent. Hymenophoral trama regular, composed of hyphae with cylindrical to inflated, 3.5–14(–21) μm wide cells; subhymenium narrow, densely ramose, but here and there almost subcellular on account of strongly inflated cells. Pileipellis in KOH pale sordid yellow, made up of loosely arranged, subradial hyphae consisting of long to very long, often broad cells, ((14–)40–87(–200) × (4–)18–34(–45) μm), downwards gradually passing into denser and more strictly radial context of pileus (because of the scanty material pileipellis not studied in radial section); an inconspicuous, very thin suprapellis of scattered narrow hyphae sometimes present. Trama of stipe (near apex) composed of frequently septate, cylindrical hyphae from 2.6 μm wide near surface to 11 μm wide at centre, with slightly thickened wall. Caulocystidia in clusters at apex of stipe, 24–42 × 4–13(–17) μm, rather variable, from irregularly filiform, fusiform, subutriform or sublageniform to irregularly, broadly clavate, sometimes subcapitate, thin-walled. Clamp-connections present.

Habitat & distribution — Under *Alnus incana* at 1150 m altitude in the Swiss Alps and on boggy, peaty soil under *Alnus* and *Betula* in Denmark.

Collections examined. SWITZERLAND: Kanton Graubünden, Engadin, Schuls, Pradella, 30.VIII. 1986, *E. Horak 3341* (holotype, ZT). — DENMARK: Zealand, Sorø, Sønderskov, Runde Mose, 24.VIII. 1977, *H. Knudsen s.n.* (C, L).

Among the clamp-bearing, coloured species without cheilocystidia, *P. ellipticospora* is characterized by small, slender, entirely lilacinous to violaceous basidiocarps, a pileipellis consisting of chains of very large cells (with or without a thin suprapellis of narrow hyphae), and comparatively large, broadly ellipsoid to ellipsoid spores. It resembles *P. subglobispora* (nom. prov.), which has similar large cells in the pileipellis, but that provisional species has rounder spores and seems to have a different ecology.

13. **Pseudobaeospora subglobispora**, *nom. prov.* — Fig. 13

Basidiocarps very small to small, slender, terrestrial, in small groups. Pileus 2–8 mm in diameter, hemispherical or obtusely conical, becoming plano-convex to flat, sometimes with small umbo, rather pale, lilacinous cream to pinkish grey, felted to silky, aeriferous. Lamellae subdistant to somewhat crowded (L = 8–12, l = 0–3), emarginate to adnate, cream to pale lilac or greyish pink, with entire margin. Stipe 10–30 × 0.4–1.0 mm, somewhat flexuous, cream to pale brownish or greyish pink, subfibrillose, at apex pruinose-flocculose, at base with some whitish rhizoids.

Spores [26/2] 3.6–4.5 × 3.2–4.3 μm, Q = (1.00–)1.05–1.15(–1.25), average Q = 1.10, subglobose, rarely globose or broadly ellipsoid, at first thin-walled and non-amyloid, becoming thick-walled, weakly dextrinoid, congophilous, strongly cyanophilous, and not or only very weakly metachromatic in cresyl blue when fully mature. Basidia 21–25 × 5.6–8.2 μm, 4-spored, with clamp-connection, rarely 2-spored. Sclerified basidia present, scattered. Cheilocystidia absent. Hymenophoral trama made up of

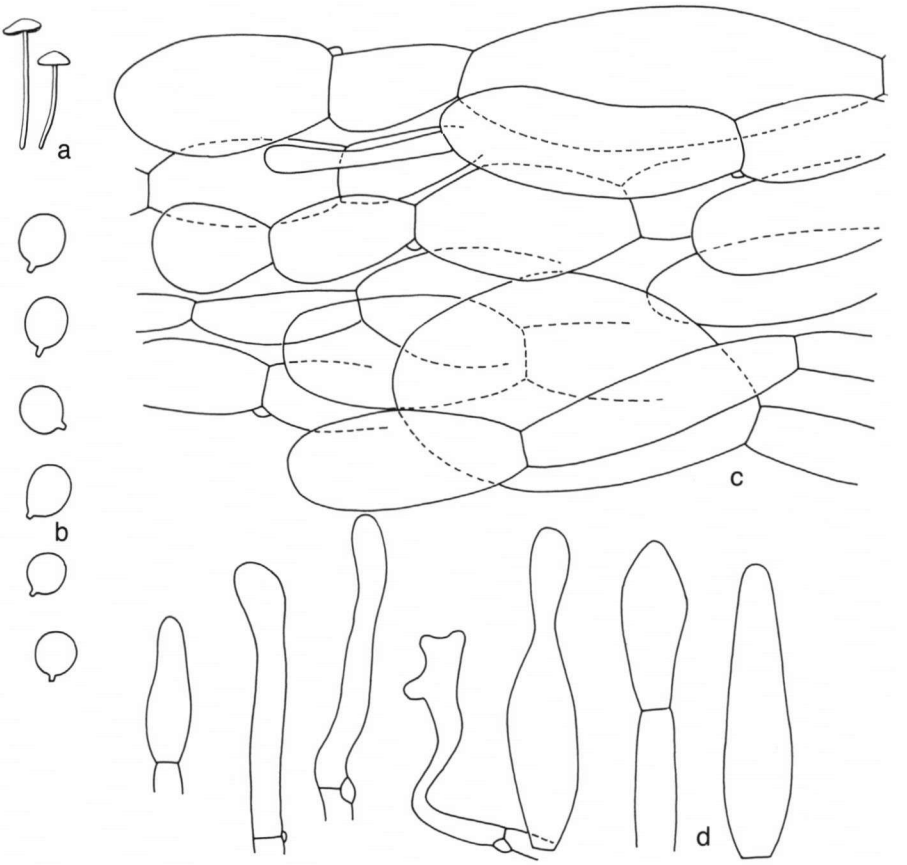

Fig. 13. *Pseudobaeospora subglobispora*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (scalp) × 1000; d. caulocystidia × 1000.

somewhat irregularly disposed, subparallel, up to 37 μm wide hyphae constricted at septa; subhymenium narrow, densely ramose (in cresyl blue a great number of bright pink globular droplets, about the size of the spores or somewhat larger, were observed in the crushed tissue of a lamella of coll. I5.X.2000). Pileipellis very pale brownish to pale yellow-brown in KOH, consisting of irregularly disposed to subparallel chains of strongly inflated cells, 12–57 × 9–30 μm, particularly at centre making a subcellular impression; in one young basidiocarp with a fragmented, very thin suprapellis of 2.5–6.0 μm wide hyphae; in coll. 15.X.2000 a few slenderly clavate pileocystidia (e.g. 27–45 × 5–7 μm) were seen in a radial section. Caulocystidia at apex of stipe 18–44(–73) × 2–9 μm, filiform, broadly cylindrical, or narrowly sublageniform, rarely somewhat nodulose. Clamp-connections present.

Habitat & distribution — On calcareous dry heathland (30.X.1998) and in dry unmown grassland on coral limestone tending towards a *Ligustro–Prunetum* (15.X.2000). Only known from middle and southern Germany.

Collections examined. GERMANY: Bavaria, Niederbayern, Kelheim, 30.X.1998, *L.G. Krieglsteiner s.n.* (STU); Hessen, Dillenburg, 'Gonkelrain', 15.X.2000, *L.G. Krieglsteiner s.n.* (STU).

Among the clamp-bearing, coloured species without cheilocystidia, with a non-hymeniform pileipellis, and without a strong KOH reaction, *P. subglobispora* in its present concept is characterized by the very small to small, pale coloured basidiocarps, the small subglobose spores and the thick pileipellis of very large cells, with or without a very thin suprapellis of narrow hyphae. It seems very closely related to *P. ellipticospora.*

Unfortunately, both collections cited are rather poor and show some differences, particular in the pileipellis, viz. shorter and broader inflated cells, 12–18 × 23–30 μm, in more disorderly arranged chains in coll. 30.X.1998, versus longer and less broad cells, 15–57 × 9–20(–29) μm in more radial chains in coll.15.X.2000.

The matter becomes even more complicated when a third collection is taken into consideration that keys out under the present provisional name with the key in the first part of this paper (Bas, 2002). Its characters are not included in the description above.

Pseudobaeospora ?subglobispora, ENGLAND: Somerset, Leigh Woods, 14.IX.1992, *T. Læssøe 2842, K(M) 20139* (K).

This collection is very similar to the two described above, but differs by the brownish purple colour of the basidiocarp, slightly smaller and rounder spores (3.1–3.8 × (2.7–)2.9–3.5 μm, Q = 1.00–1.15, average Q = 1.05–1.10), and somewhat narrower inflated cells (15–35 × 6–12 μm) in the pileipellis. It was found terrestrial among tall grasses, associated with Clavariaceae and Hygrophoraceae.

Given the differences between these three collections and the very small number of tiny basidiocarps available, it seems preferable to refrain from formally describing *P. subglobispora* as a new species. In its present provisional concept it seems closely related to *P. ellipticospora* (see discussion there).

14. **Pseudobaeospora pallidifolia** Bas, Gennari & Robich — Fig. 14

Pseudobaeospora pallidifolia Bas, Gennari & Robich, Riv. Micol. 40 (1997) 194, col. pl.

Basidiocarps rather small and slender, terrestrial, in small group. Pileus 10–15(–20) mm in diameter, at first convex, then plano-convex, with or without a low obtuse umbo, violaceous brown (in colour-slide ± Munsell 5 YR 4/3), but darker at centre and much paler at margin, with dull, slightly wrinkled surface, not hygrophanous, not striate at margin. Lamellae free to just reaching apex of stipe, moderately crowded (L = ± 20–22, l = 1–3), ventricose, whitish to pinkish cream, with concolorous, entire edge. Stipe 25–35 × 1–2 mm, somewhat flexuous, bent at base, slightly wider at apex, pale slightly pinkish tinged grey-brown, whitish pruinose at apex. Context very thin, reddish brown, lilacinous in centre of pileus. Smell somewhat farinaceous. Taste indistinct. Spore print white.

Spores [30/1] (4.2–)4.4–6.4(–6.9) × (2.7–)3.0–4.4(–4.8) μm, Q = (1.10–)1.15–1.60(–1.65), average Q = 1.30–1.40, broadly ellipsoid to ellipsoid, smooth, at first thin-walled and inamyloid, becoming thick-walled, weakly dextrinoid, congophilous, cyanophilous and metachromatic in cresyl blue when fully mature. Basidia 18–26 × 5.2–6.6 μm, mainly 4-spored, but also a few 2- and 1-spored, with clamp-connection. Sclerobasidia present but sparse. Cheilocystidia absent. Pileipellis a cutis of radial,

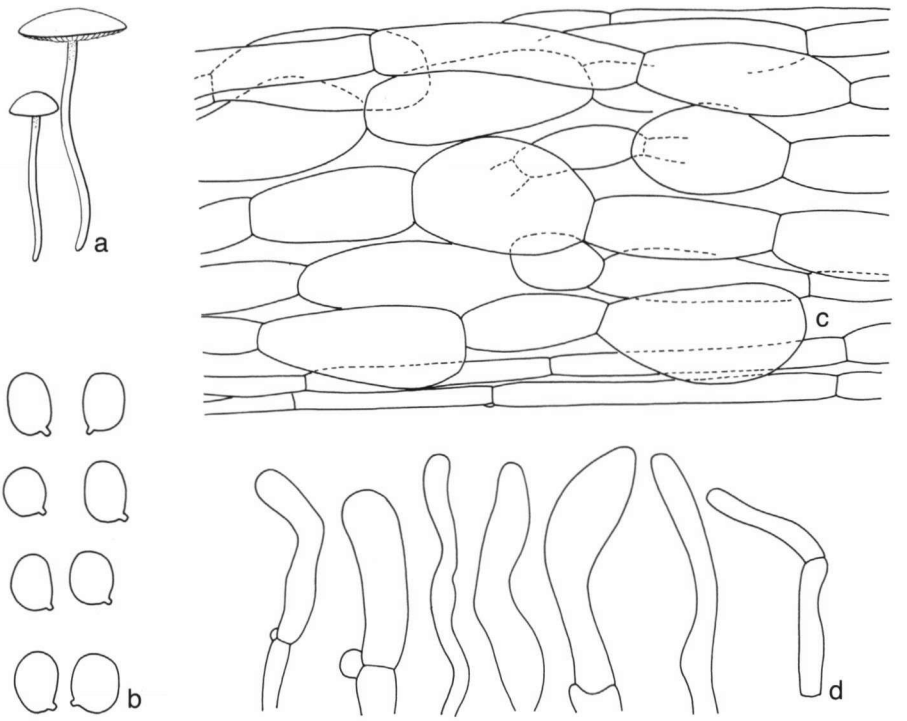

Fig. 14. *Pseudobaeospora pallidifolia*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (radial section) × 500; d. caulocystidia × 1000.

(5–)8–32 μm wide hyphae made up of cylindrical (particularly in upper part) to inflated cells (particularly in lower part), but not clearly divided into two layers, with minutely encrusted walls, becoming fairly dark greenish blue in KOH and NH_4OH. Stipe made up of regularly septate, cylindrical, longitudinal, 3–12 μm wide hyphae with slightly thickened walls. Caulocystidia at apex of stipe in dense clusters, rather irregularly cylindrical to subclavate, 25–36 × 3.5–9.0 μm, thin-walled. Clamp-connections present.

Habitat & distribution — On mossy ground under conifers. Known only from type locality in Italy.

Collection examined. ITALY: Toscana, Passo dello Scopetone near Arezzo, 19.XI.1992, *A. Gennari s.n.* (holotype, MCVE 598; isotype, L).

Pseudobaeospora pallidifolia is well characterized by its dark pileus with pale margin, strongly contrasting whitish to pinkish cream lamellae, rather pale stipe, and comparatively large and elongate spores.

V. **Pillodii** group

Basidiocarps coloured, very small to small, and very slender. Clamp-connections absent from basidia and all tissues. Pileipellis a cutis, with or without pileocystidia.

15. **Pseudobaeospora pillodii** (Quél.) Wasser — Fig. 15

Collybia pillodii Quél., C.r. Ass. Franc. Av. Sci. (Champ. Jura Vosges, suppl. 17) 18 (1890) 509. — *Pseudobaeospora pillodii* (Quél.) Wasser, Fl. Fung. RSS Ucrainicae, Bas. Agar. (1980) 220.

Selected descriptions: E. Horak, Syn. Gen. Agaric. In Beitr. Kryptog. Fl. Schweiz 13 (1968) 512 (as *P. oligophylla*); Kühn. & Romagn., Complém. Fl. anal. III. In Bull. Soc. Oyonnax 8 (1954) 92 (Biblthеca mycol. 56: 128, 1977) (as *Collybia pillodii*).

Basidiocarps very small to small and slender to very slender, gregarious, usually terrestrial, but sometimes on woody fragments. Pileus 1.5–13 mm in diameter, conico-campanulate or obtusely conical to plano-convex with umbo, when young with margin somewhat inflexed, dark brownish lilac to pale purplish, violaceous grey, or grey-brown (Munsell 10 YR 6/3–4/3), rarely pale grey, pallescent with age, sometimes with white to pallid, hoary margin, silvery fibrillose to felted, non-striate. Lamellae narrowly adnate to free, subdistant to crowded (L = 12–19(–30), l = 0–3), pinkish lilacinous violet, purplish lilac, purplish brown (5 YR4/3), or brownish lilac, pallescent with age. Stipe 18–55(–70) × 0.2–1.0 mm, cylindrical or filiform, frequently tapering downwards, hollow, lilacinous to lilac-brown, pinkish to purplish grey-brown (± 7.5 YR 4/2), or

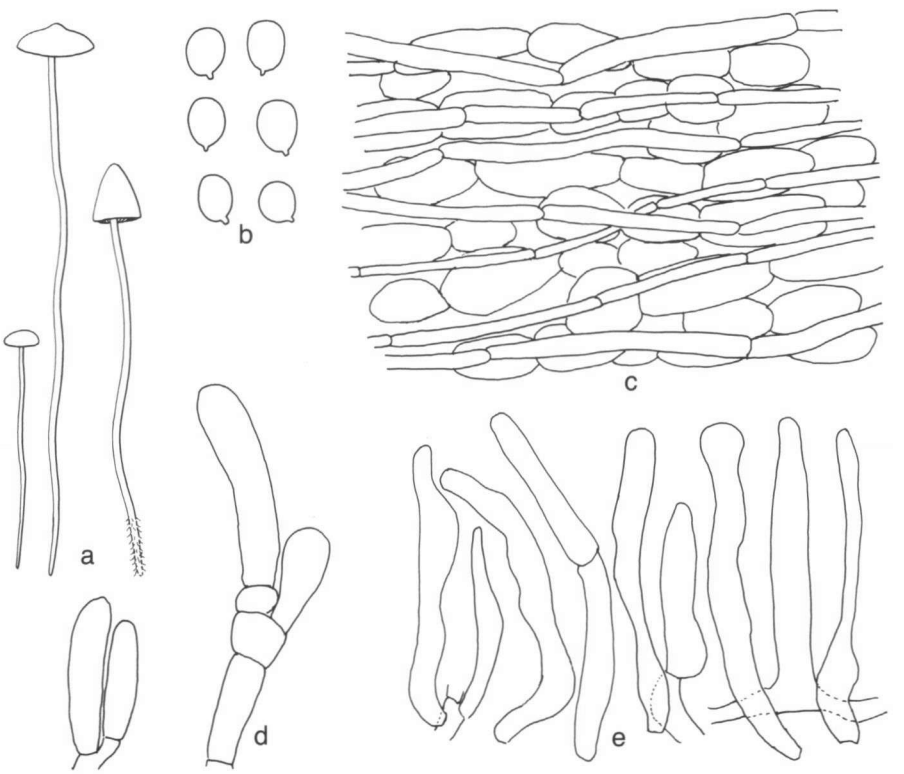

Fig. 15. *Pseudobaeospora pillodii*. a. Basidiocarps × 1; b. spores × 1500; c. pileipellis (scalp) × 500; d. basidioles × 1000; e. caulocystidia × 1000.

dark brownish purple, sparsely whitish fibrillose or not, minutely white flocculose at apex, with white tomentum and white to whitish-yellowish rhizoids at base. Context concolorous. Smell absent or aromatic. Spore print colour white.

Spores [90/7] (3.2–)3.7–4.5(–4.9) × (2.6–)2.9–3.6 μm, broadly ellipsoid to ellipsoid, Q = (1.05–)1.15–1.40(–1.50), average Q = 1.15–1.25 (–1.30), at first thin-walled and non-amyloid, later thick-walled, weakly dextrinoid, congophilous, cyanophilous and metachromatic in cresyl blue. Basidia 17–26 × 4.5–6.5 μm, 4-spored and/or 2-spored, clampless. Sclerified basidia present, scattered, ± dextrinoid. Cheilocystidia absent. Hymenophoral trama regular, consisting of 4–18 μm wide hyphae; subhymenium ± (7–)10–15 μm thick, ramose to cellular. Pileipellis pallid to red-brown in KOH, made up of a distinct to rather indistinct suprapellis of 1.6–7.0(–10) μm wide radial hyphae (sometimes lacking?), gradually passing into a subpellis of rather short- and broad-celled hyphae (cells 15–40(–44) × 8–28(–35) μm); subpellis ± dextrinoid, rarely with a very few repent to slightly ascending, cystidioid terminal cells. Trama of stipe composed of regularly septate, straight hyphae, from 2–5 μm wide at surface to 8–14 μm wide inside. Caulocystidia at apex of stipe, solitary or in small clusters, filiform or (sub)cylindrical to very narrowly clavate, rarely narrowly lageniform, (10–)28–42 × 2.5–7.0 μm, sometimes slightly interwoven. Clamp-connections absent.

Habitat & distribution — On needle carpets under *Picea, Pinus cembra, Abies,* and *Larix*, once on fallen branch of *Alnus viridis* in shrubbery on acid rock, under *Alnus incana*, but also in felted turf of poor grassland on calcareous soil, often in subalpine habitats at up to 1700 m altitude. Known from Northern and Central Europe.

Collections examined. GERMANY: Nordrhein-Westfalen, Lennestadt, Elspe, nature reserve Rübenkamp, 24.X.1999, *L.G. Krieglsteiner s.n.* (STU). — SWITZERLAND: Kanton Bern, Andersteg, Gasterital, 7.VIII.1987, *B. Senn-Irlet 87/84* (BERN); Axalp, 23.VIII.1996, *J. Gilgen 2063* (BERN); Kanton Uri, Schächental, 19.VIII.1997, *B. Senn-Irlet 97/69 & E. Wiedmer* (BERN); Kanton Ticino, Ghirone, Baselga, 12.IX.1988, *E.C. Vellinga 1364* (L); Kanton Graubünden, Stillberg, Dischmatal, 17.IX.1963, *E. Horak 63/156 & E. Müller* (ZT, as *P. oligophylla*). — RUSSIA: Siberia, Polar Ural, Slantsevaya Mountain, 24.VIII.1996, *U. Peintner 96/672* (IB, as *P. oligophylla*).

The present concept of *P. pillodii* is based on that of Kühner in Kühner & Romagnesi (1954) and Horak (1968). Probably the type of Quélet's *Collybia pillodii* does not exist and Quélet's illustration and very concise original description are difficult to interpret, particularly after the recent increase of the number of species in the genus. However, there is nothing in the description and the illustration that excludes the present concept, except the surface of the spores that is described as minutely spinulose ('finement aculéolée'). But as the spores of all species of the genus examined by the author are glabrous under the light microscope (in the only species tested, also in SEM), Quélet was probably mistaken.

Pseudobaeospora pillodii is characterized by very small to small, very slender, coloured basidiocarps, lacking clamp-connections (even from the basidia), broadly ellipsoid spores (3.7–4.5 × 2.9–3.6 μm, average Q = 1.15–1.25), and a pileipellis composed of fairly broad, radial hyphae, with or without a suprapellis of narrow hyphae, and lacking pileocystidia.

Although specimens have been found with 2-spored basidia only, nothing is gained by formally describing a 2-spored variety or forma, as specimens occur with 2- and 4- spored basidia sometimes even on one lamella.

The very similar *P. oligophylla* in its present sense differs from *P. pillodii* mainly in a pileipellis with many repent to ascending, pileocystidioid terminal cells. It could very well represent a variety of *P. pillodii* (the oldest name of the two). However, although in Singer's diagnosis of *P. oligophylla* such a pileipellis is rather precisely described, its type has not yet been analysed. Therefore, at the moment it seems unwise to introduce a new combination.

Pseudobaeospora pillodii may have a much wider range of distribution than indicated above, as the name occurs in quite a few publications. But there is little sense in recording all these reports here, as the available data are often insufficient for a positive identification. *Pseudobaeospora pillodii* sensu Redhead (1982) from Canada might represent perhaps *P. oligophylla*, because of the presence of rather simple pileocystidia (unfortunately the absence or presence of clamp-connections is not mentioned).

Pseudobaeospora defibulata Singer is probably related; see under extralimital species.

16. **Pseudobaeospora oligophylla** (Singer) Singer — Fig.16

Baeospora oligophylla Singer, Rev. Mycol. 3 (1938) 194; *Pseudobaeospora oligophylla* (Singer) Singer, Lilloa 22 ('1949') (1951) 438.

Misapplied: ? *Pseudobaeospora pillodii* sensu Redhead, Fungi Canadensis 217 (1982).

Basidiocarps very small, terrestrial, solitary to gregarious. Pileus 4–6 mm in diameter, at first paraboloid, then conical, convex to plano-convex, with very small umbo or papilla, with margin at first slightly inflexed, later straight, somewhat eroded, non-striate, dark violaceous grey-brown (Munsell 10 YR 3/2), paler moderately dark violaceous grey (10 YR 6/2–5/2) towards margin, dry, minutely tomentose under lens, matt. Lamellae narrowly adnate, rather crowded (L = ± 19, l = 3), thickish, narrow, only slightly ventricose, slightly undulating, concolorous to margin of pileus, with entire, slightly darker edge. Stipe 10–27 × ± 0.75 mm, somewhat flexuous, concolorous with centre of pileus but paler at apex, with minute, white, fibrillose scales all-over, but more distinctly so at apex, at base with white tomentum and a few rhizoids and these in some basidiocarps apparently connected with small ochre-yellow grains in the soil. Context concolorous with surface. Smell indistinct.

Spores [20/1] 3.4–3.9(–4.4) × 2.8–3.5(–3.7) µm, Q = 1.05–1.40, average Q = 1.15–1.25, subglobose to broadly ellipsoid, rarely ellipsoid, at first thin-walled and non-amyloid, later thick-walled and rather weakly dextrinoid, congophilous, cyanophilous, and sometimes metachromatic in cresyl blue. Basidia 18.2–21.4 × 5.6–6.4 µm, 4-spored, without clamp-connection. Cheilocystidia absent. Hymenophoral trama ± regular, composed of about 7–15 µm wide hyphae; subhymenium ± 10 µm wide. Pileipellis made up of a narrow, ± 10–20 µm thick suprapellis of loosely arranged, 3.5–8.5 µm wide, radial hyphae, over a narrow, ± 10–35 µm thick subpellis of 9–18 µm wide, short-celled hyphae; suprapellis with abundant repent to ascending, rarely erect pileocystidia, 26–43 × 4.0–7.5 µm, cylindrical to sublageniform and subutriform, rather frequently subcapitate (apex 3.5–8.0 µm wide), at centre almost forming an irregular trichoderm. Trama of stipe composed of 4–11 µm wide, closely packed, thin-walled, straight hyphae. Caulocystidia 15–52 × 4–7 µm, single or in clusters, subcylindrical

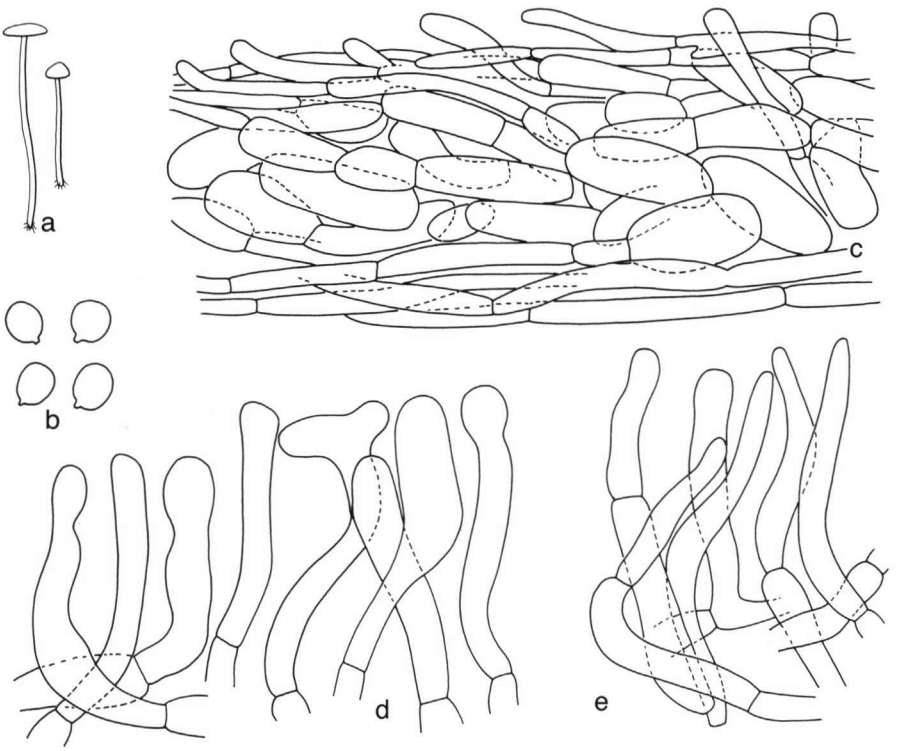

Fig. 16. *Pseudobaeospora oligophylla*. a. Basidiocarp (reconstructed) × 1; b. spores × 1500; c. pileipellis (radial section) × 500; d. pileocystidia (from centre of pileus) × 1000; e. caulocystidia × 1000.

to very narrowly lageniform, mostly with tapering neck, but also sometimes broadly rounded, thin- to slightly thick-walled. Clamp-connections absent.

Habitat & distribution — On loose forest litter under *Picea* at 1240 m altitude in the Swiss Alps. (The type collection, not studied here, was found among mosses under *Larix siberica* and *Pinus siberica* at 1900 m altitude in the Altai in Russia.) Possibly also in Canada, see discussion below.

Collection examined. SWITZERLAND: Kanton Bern, Feutersoey, Tschärzisbach, 30.IX.1991, *N.J. Dam, ND 91134* (L).

When Singer (1938) described the present species as *Baeospora oligophylla*, apparently he had never seen *Pseudobaeospora pillodii* (Quél.) Wasser, described 48 years earlier by Quélet (1890) as *Collybia pillodii*. He merely noted that that species probably belongs to the genus *Baeospora* too. There has been quite a bit of speculation about the relation between *P. pillodii* and *P. oligophylla* and some authors, e.g. Horak (1968), considered these only two clampless European taxa conspecific. This is quite understandable, when Singer's description is compared with the descriptions of *P. pillodii* in its current concept.

However, there is one element in that description that seems to have escaped attention, viz. Singer's description of the suprapellis, which disagrees with *P. pillodii*. Dr. R.A. Maas Geesteranus (in litt.) kindly translated it from Latin as follows: "... terminal cells somewhat erect, clavate to cylindrical and obtusely rounded, very rarely inflated to globules, but usually repent, filiform or in chains ...", and he added a small sketch showing what he thought the suprapellis would look like and which agrees very well with the suprapellis of the present collection as illustrated here. But the very rare globules mentioned by Singer have not been found. In the basidiocarps of *P. pillodii* cited in this paper pileocystidioid structures are lacking completely. Unfortunately, the present author has not been enabled to examine the type of *P. oligophylla*, that, if it exists, is presumably kept in LE.

The collector of the material described above, observed that some of the rhizoids were connected to very small ochre-yellow grains in the soil "like those of *Collybia cookei*, but a bit smaller", but there were also grains scattered in the soil not connected to rhizoids. It is very uncertain whether these grains belong to the species or not, but that possibility should not be excluded.

Redhead (1982) published a description under the name *P. pillodii*, based on a collection from British Columbia, Canada, which resembles that of *P. oligophylla* very much (see the discussion under *P. pillodii*).

EXTRALIMITAL SPECIES

A few species of *Pseudobaeospora* have been described from North and South America and one from India. None of these seems to be conspecific with any of the European taxa treated here. Their most important characters are given below.

Pseudobaeospora chilensis E. Horak, Rev. Mycol. 29 (1964) 76, from Chile.

Basidiocarps entirely violet-lilac; clamp-connections present; no cheilocystidia; pileipellis a cutis, not colouring in KOH.

Keys out near *P. argentea*, but spores very small, 2.8–3.4 × 2.5–2.8 μm.

Pseudobaeospora citrina Rawla & S. Arya, Boletus 15 (1991) 111, from India.

Basidiocarps entirely greenish yellow; clamp-connections absent; spores 4.5–5.6 × 3.5–4.2 μm, strongly dextrinoid; cheilocystidia lacking; pileipellis a cutis of up to 7 μm wide hyphae, with fasciculate hairs (28–140 × 3–5) with slightly thickened walls; similar hairs on stipe; context amyloid.

If this is a *Pseudobaeospora*, it is a very unusual one.

Pseudobaeospora defibulata Singer, Mycologia 55 (1963) 13, from Argentina.

Pileus pale livid to nearly white, 4–7 mm in diameter; lamellae livid-violet; stipe 10–20 × 0.2–0.6 mm, dusky livid; clamp-connections lacking; cheilocystidia absent, but edge with some sterile basidioles with deformed apex; pileipellis a cutis, made up of a very thin suprapellis of very thin, parallel hyphae over a subpellis of somewhat broader hyphae; KOH reaction unknown, but colourless in NH_4OH; spores 4.0–4.2 × 3.0–3.2 μm.

Belongs apparently to the *Pillodii* group. Differs from *P. oligophylla* (in the present sense) especially by the absence of pileocystidia, from *P. pillodii* by the much paler pileus and the narrower hyphae of the subpellis (according to Singer somewhat broader than those of the suprapellis, but width not given).

Pseudobaeospora flavescens Singer, Mycofl. austr. (Beih. Nova Hedwigia. 29) (1969) 172, from Chile.

Very small (pileus 6 mm in diameter; stipe ± 22 × 1 mm); pileus yellow, lamellae and stipe pale yellow; clamp-connections present; cheilocystidia absent; pileus a cutis of filamentous, repent, subparallel hyphae; spores 4–5 × 3–4 μm.

This species might be placed in the *Albidula* group, but the European species are not yellow. *Pseudobaeospora albidula* has a pileipellis of chains of inflated cells and the pileipellis of *P. paulochroma* is duplex.

Tricholoma microspora sensu Dennis, Trans. Br. mycol. Soc. 34 (1951) 479, pl. 22 fig. 5 = *Collybia syringea* sensu Dennis, Fung. Fl. Venezuela (Kew Bull. Add. Ser. 3) (1970) 27, pl. 5 fig10, from Venezuela.

Basidiocarps small (pileus up to 10 mm in diameter), dark violet, but lamellae lilac; clamp-connections present, spores ± 3.4 × 2–3 μm, non-amyloid; pileipellis a cutis of smooth hyphae.

Insufficiently known, but almost certainly a species of *Pseudobaeospora.*

Pseudobaeospora murrillii E. Horak, Rev. Mycol. 29 (1964) 79. A new name introduced by Horak for *Mycena syringea* (Murr.) Murr., Mycologia 8 (1916) 221 = *Prunulus syringea* Murr., North Amer. Fl. 9 (1916) 341, from Jamaica.

Insufficiently known. Smith (1947) studied the type and together with Murrill's diagnosis this gives the following picture: pileus 5 mm in diameter, lilac with fulvous disc, subgranular; lamellae distant, adnate, violet; stipe 20 × < 1 mm, melleous, lilac at apex; spores 3–4 μm, globose to subglobose, smooth, non-amyloid; cystidia absent; pileipellis a mat of appressed hyphae with saccate tips; presence or absence of clamp-connections not mentioned.

Although thick-walled, dextrinoid spores are not mentioned, this is indeed probably a species of *Pseudobaeospora.* The colours of the pileus, the small (sub)globose spores, and the quite typical pileipellis seem to define it as a well-recognizable species. Further records of it from several parts of the USA have to be carefully restudied.

Pseudobaeospora syringea Singer, Mycologia 55 (1963) 15, from Peru.

Basidiocarps small (pileus 9–12 mm in diameter, stipe 30–35 × 0.8–1.5 mm); pileus violet, becoming darker and more greyish; lamellae livid-violet, becoming more greyish; stipe pallid to fuscous, but with apex livid-violet when young; spores (3.5–)4.0–4.5 × (2.8–)4.0–4.5(–7.0) μm, thin- to slightly thick-walled, non-amyloid to dextrinoid, often roughened by thin but rather resistant ornamentation; without true cheilocystidia, but empty, often deformed, sometimes *Helvella*-shaped [?] basidioles here and there among normal basidia at edge of lamellae; pileipellis a cutis, consisting of a suprapellis of filamentous hyphae and a subpellis of hyphae made up of much broader cells, pale buff in KOH; clamp-connections present.

Pseudobaeospora syringea keys out near *P. frieslandica*, but has one character not observed before in the genus, viz. finely ornamented spores. It has been found in a rather extreme habitat, viz. at 3700 m altitude in the montane zone of Peru.

Some other species possibly belonging to *Pseudobaeospora* are:

Agaricus (Collybia) fuscolilacinus Peck, Ann. Rep. N.Y. St. Mus. Nat. Hist. 39 (1886) 38, from USA (Adirondack Mts).

Basidiocarp small (pileus ± 9–18 mm, stipe ± 37–74 × ± 2.5 mm); pileus brown to lilac-brown, glabrous, rugose when dry; lamellae close, adnexed, brownish; stipe concolorous with pileus, pruinose at apex, whitish felted at base; spores 4–5 µm, subglobose to broadly ellipsoid. Type-study required.

Collybia syringea Singer, Mycologia 47 (1955) 768, from Brasil (Paraná).

Basidiocarp small (pileus 12 mm in diameter, stipe 29 × 0.7–1 mm); pileus violaceous, becoming sordidly pallid, glabrous; lamellae violaceous blue, distant, adnexed; stipe concolorous with lamellae, glabrous at apex, tomentose-strigose at base; spores 3.3–4.5 × 3–3.5 µm, broadly ellipsoid, thin-walled, inamyloid; basidia 4-spored; cheilocystidia scattered, 25–30 × 2.7–3.5 µm, up to 6 µm at subventricose base, pileipellis composed of appressed hyphae; superficial hyphae consisting of broad, up to 17 µm wide cells, with terminal, sometimes clavate cells; clamps present.

It should be noted that Singer (1986: 281) did not transfer this taxon to *Pseudobaeospora*, but placed it with a question mark in *Pleurocollybia*. Type-study required.

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For a taxonomic study of a genus like *Pseudobaeospora*, with its many apparently rare species with their often tiny, inconspicuous basidiocarps, the help of many collectors is a must. Very few European mycologists have seen more than two species of *Pseudobaeospora* fresh. Lothar Krieglsteiner must have a special eye for them, because he provided me with well-annotated collections of six species, for which I am very grateful. Special thanks are also due to Thomas Læssøe, who besides sending in his personal collections of three species, drew the author's attention to the crucial collections of *Pseudobaeospora* from England gathered by Alick Henrici, J.C. Leedal, and L. Livermore, conserved in the mycological herbarium of the Royal Botanic Gardens at Kew. These were kindly made available for the present project by the Director of that Institute.

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